Climate Change, Migration, and the Emergence of Village Life on the Mississippian Periphery: A Middle Ohio Valley Case Study

Dissertation

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Abstract

The emergence of agrarian village life in the Middle Ohio Valley has traditionally been viewed as an isolated, autochthonous development. Fort Ancient (AD 1000-1650) societies are seen as direct descendants of preceding Late Woodland (AD 500-1000) groups. The processes presumed to underlie this transition are gradual aggregation and a growing reliance on maize over time. This project examines village development in detail at Turpin (33HA19), a well-known transitional site in the Little Miami Valley of southwestern Ohio. Relying on the tenets of macroevolutionary theory, I develop a multiscale framework with four scales of analysis focused on better understanding village development. First, I thoroughly examine one early Fort Ancient site, Turpin, with a focus on community structure, household architecture, chronology, and material culture. Second, I place these finding in the context of contemporary communities in the Middle Ohio Valley, comparing sites based on community structure, architectural style, and ceramic characteristics. Third, I expand scope of analysis by adding contemporary early Mississippian sites in the Lower Ohio Valley and eastern Tennessee, providing a comparative framework for understanding the importance of interregional contact in cultural change. Finally, considering cultural transitions during the period between AD 1000 and AD 1400 occurred in the contexts of the Medieval Climate Anomaly, I use prehistoric drought data to examine shifting climatic conditions in the Midcontinent. These conditions reflect potential push and pull factors influencing the movement of people throughout this region.
The findings of this multiscalar project provide evidence that the early Fort Ancient period in the Lower Miami Valleys was catalyzed by an influx of Mississippian migrants. Excavations at Turpin have produced evidence of two early Fort Ancient communities. One house in each community was excavated. House 1 is a Mississippian-style wall trench structure first constructed between cal. AD 1040 and cal. AD 1188, and then renovated between cal. AD 1162 and cal. AD 1250. The basin of this structure was filled with refuse, including Mississippian-like shell tempered vessels with plain surfaces. House 2 is another Mississippian-style wall trench structure built between cal. AD 1206 and cal. AD 1270. This house basin was filled with more classic Fort Ancient ceramics after its occupation ended.

Comparing early Fort Ancient sites in the Lower Miami Valleys with contemporary Fort Ancient and Mississippian sites suggests that sites like Turpin, Guard, and State Line were occupied by Mississippian people. These three sites all demonstrate notable Mississippian characteristics, including shell tempered ceramics, circular villages, wall trench houses, and non-local individuals. The movement of Mississippians into the Middle Ohio Valley occurred at a time in which Mississippian polities to the west experienced significant multi-decadal droughts. During this time, the Middle Ohio Valley remained relatively wet. These conditions provided important push (drought) and pull (wet conditions) factors for maize agriculturalists. I argue that mounting evidence from Turpin and other early Fort Ancient sites, many of which stand in stark contrast to preceding Late Woodland settlements, reflect the remains of Mississippian communities, the founders of which emigrated from Mississippian centers like Angel, Kincaid, and Cahokia.
Dedication

This project is dedicated to my family and friends, many of whom were crucial to its completion, and to my dog Noah, who I lost while finishing this dissertation.
Acknowledgements

Any project of this magnitude requires the support of numerous people. Unfortunately it is impossible to thank each in detail, but I would like to take a brief moment to recognize a few of those whose support and input has been essential.

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Chapter 1: Introduction to the Problem

Understanding long-term adaptations of human societies to climate change is perhaps one of the most important benefits archaeology can provide to the social sciences. In the contemporary world, rapid climate change has resulted in subsistence stress and the movement of large groups of people, creating conflict and the emergence of new social relationships. Although it may seem like change of great magnitude is a relatively modern phenomenon, prehistory is also marked by significant transitions. People in the past interacted, fought, traded, migrated, made pilgrimages, and participated in religious movements, all of which engendered social change and created novel cultural patterns. Much like now, prehistoric people also had to adapt to environmental change and shifting climate systems. Providing time-depth to such adaptations can help broaden contemporary adaptation, mitigation, and sustainability initiatives. The present study draws attention to the historical processes involved in movement, interaction, and adaptation to environmental change in prehistory through examination of the emergence of Fort Ancient (c. AD 1000-1650) villages in the American Midcontinent. This work tests traditional models of gradual, in situ cultural development by exploring early villages in a broader socio-environmental context. Working at multiple scales of analysis, I nest findings from newly excavated prehistoric houses within local and regional contexts, set against the backdrop of diachronic changes in regional climate systems. Findings demonstrate that the movement of Mississippian agricultural communities in response to climate change had a formative influence in the Middle Ohio Valley, ultimately resulting in a novel constellation of economic and social arrangements referred to by archaeologists as Fort Ancient culture.

The fundamental question underlying this study is whether the shift to village life in this region was primarily a result of in situ development, interaction, or migration. Although not often considered, the role of climate change is at the heart of this issue
considering the first villages in the Middle Ohio Valley emerged during a climate phase known as the Medieval Climate Anomaly (Lamb 1965). Questions of this nature require both detailed examination of transitional communities and an understanding of the patterned transmission of ideas at increasing social and spatial scales. Although change is often considered as primarily the result of macro-level (i.e. climate change) or micro-level (i.e. agency or autochthonous development) factors, investigations at a single scale ignore complex interrelationships (Stein 2002). A key element of this investigation is thus the recognition that cultural change occurs as a result of processes working at and interacting across multiple scales (Kowalewski 1995).

With these issues in mind, a multiscalar framework for holistically examining change is developed to examine the emergence of village life. Drawing largely on examinations of site structure and assemblages from newly excavated domestic structures, household and community scales are examined. This scale focuses on architectural patterning, material culture, and changes in everyday practice (e.g., Lightfoot et. al 1998). Once site-level patterns are thoroughly understood, results are placed within a broader framework of contemporary villages throughout the Middle Ohio Valley. Villages are compared based on community organization, household architecture, and patterned variation in ceramics assemblages to trace connections and identify key differences. The scope of analysis is then increased to examine how regional findings fit within the context of the spread of a Mississippian lifestyle between AD 1000 and AD 1300. Finally, well-understood shifts at the regional level are interpreted against rapid changes in regional climate systems, with particular attention paid to climate thresholds and human adaptive responses. By using a multiscalar framework in which results are empirically grounded in preceding levels and used to inform on higher scales, social change in this region is more fully understood.

In order to understand these complex interrelated elements, a robust theoretical framework that recognizes multiple scales of analysis, which is crucial to illuminating ultimate and proximate causes of cultural change, is required. Macroevolutionary theory, a paradigm stemming from punctuated stances in evolutionary biology, provides such a framework (Prentiss et al. 2009; Rosenberg 1994; Spencer 1990, 1997; Zeder 2009). The
main tenets of macroevolutionary archaeology stress the importance of human agency, analysis of processes on multiple scales, and the importance of punctuated change in prehistory. In essence, this stance argues that human societies are relatively stable through time, changing rapidly in response to shifting conditions before reorganizing for subsequent periods of stability. Times of punctuated change occur as a result of processes working on multiple levels and are enacted through individuals, households, and community agency. External factors like climate can be one such process that catalyzes change (Rosenberg 1994).

Human responses to climate change have long been an important consideration in archaeological inquiry (e.g., Childe 1936; Fagan 2008; Richerson et al. 2001). However, a focus on environmental change runs the risk of deterministic arguments, in which human societies develop in lock-step with the environment (e.g., Coombes and Barber 2005). Such ecological determinism was an artifact of early processual approaches to understanding culture, and has been largely rooted out in its staunchest forms by the post-processual critique (Trigger 1991). Perhaps as a result, there was a corresponding swing of the theoretical pendulum away from consideration of ecological variables in regard to change (Trigger 2006:445). Many post-processual archaeologists eschewed the environment as a meaningful agent of change. At present, a middle ground appears to have been reached. Prevailing approaches typically consider not only social or ecological variables and their influence on cultural change, but instead highlight interactions between these elements.

Instead of attempting to identify one-to-one relationships between climate and culture change, the present study focuses on environmental change in terms of parameters and thresholds. In this approach, the environment is seen as one of many interacting factors influencing human societies by setting general parameters on possible actions. Within such parameters people and societies exhibit broad variation. Once thresholds are crossed in terms of the variability and severity of climate change, people and societies are often forced to alter their traditional ways of life. Thresholds in this sense are periods in which there are abrupt changes in environmental systems that result in qualitative shifts from inhabitants of affected ecosystems (Groffman et al. 2006). In many situations, these
abrupt changes are climatic in nature. Abrupt climate changes are transformations that are so rapid and unforeseen that cultural systems have a hard time adapting in their present form, particularly if these changes persist for long periods of time (Alley et al. 2002:14). Frequently, people are forced to alter economic strategies in order to accommodate new environmental conditions, changes which typically have systemic ramifications.

A common response to relatively rapid climate change is movement (e.g., D’Andrea et al. 2011; Kohler and Varien 2012; Kohler et al. 2013; Newland 2011). This is particularly relevant in contemporary societies, and is currently evident in terms of migrant crises throughout the Mediterranean and Europe. For example, it has been argued that one of the factors contributing to the current conflict in Syria and the contingent emigration of people from this region was a period of severe droughts (Gleick 2014; Kelley et al. 2015). In this case, long-term droughts undercut economic productivity in outlying farming communities, forcing people to move into cities, which spurred conflict in population centers with dwindling resources and growing population density. The end result, which is further compounded by government corruption and violence, has been a mass departure of people in search of more environmentally and politically hospitable lands. This theme has been played out many times on multiple levels (e.g., McLeman and Smit 2006; Orlove 2005) and likely will become more common in the future.

Migration was also a particularly potent solution to environmental change in prehistoric small-scale or 'tribal' societies practicing agricultural lifestyles (Bellwood 2004). Voting with one's feet often represents an easier option than dramatically reconfiguring economic and subsistence practices. One of the best documented cases in which the interplay between climate change and migration has been recorded is that of the American Southwest. In this region, abrupt climate transitions in the form of droughts throughout the 12\textsuperscript{th} and 13\textsuperscript{th} Centuries are seen as the catalyst for dramatic cultural change (Benson et al. 2009; Benson and Berry 2009; Cook et al. 2004). Subsistence patterns during this period were largely focused on maize agriculture, a crop that is sensitive to moisture availability (Benson 2011 a, b). Droughts heavily influenced the economic foundation of many Puebloan societies throughout this region and catalyzed migration within and between regions (Benson and Berry 2009; Benson et al. 2009; Ezzo
and Price 2002; Price et al. 1994). Some areas were completely depopulated, resulting in migrant communities in search of new homelands (Hegmon et al. 2008; Varien et al. 2007). In this region, environmental, archaeological, and biological data all speak to patterns of movement in response to climate change. In the American Midwest, the data required to examine such trends are only beginning to be gathered (e.g., Benson et al. 2009; Cook and Price 2015), particularly on the distant peripheries of cultural centers in the Mississippi Valley. However, the general model of climate-related movement resulting in the establishment of new communities is no less relevant.

In order to successfully address questions at a regional scale, site-level analyses must first be conducted that are theoretically syncretic and are cognizant of interplay between local, regional, and environmental scales. As such, archaeological work focuses primarily on the Turpin site (33Ha19) with these issues in mind. Turpin, located east of Cincinnati, Ohio, is considered an important transitional site occupied by semi-mobile Late Woodland foragers (c. AD 500-1000) and subsequent sedentary Fort Ancient maize agriculturalists (c. AD 1000-1650) (Drooker 1997; Griffin 1943; Riggs 1998; Seeman and Dancey 2000). Notably, this site has produced multiple indicators of contact with chiefdoms in the Central Mississippi and Lower Ohio River Valleys (Cowan 1987; Drooker 1997; Griffin 1943; Metz 1885), although systematic examination of both the site and connections between Mississippian and Fort Ancient societies has only just begun in earnest (Comstock and Cook 2016; Cook 2008; Cook and Fargher 2008; Cook and Price 2015; Schulenburg and Cook 2016).

Turpin represents an ideal location to address the broader theoretical issues outlined above, including cultural interaction, the movement of agricultural communities, and cultural adaptations to shifting climate systems. The primary research questions addressed in this study are (i) how did the transition from Late Woodland foraging societies to Fort Ancient agricultural groups occur in the Middle Ohio Valley, (ii) what influence did nearby Mississippian societies have on this transition, and (iii) how did changes in the regional climate system influence cultural patterns during this period? These questions address diachronic issues of cultural change situated within the context
of population interaction and migration, all of which is set against the backdrop of environmental change.

Project Organization

This project is organized into 10 chapters. Chapter 2 presents the theoretical framework used to examine cultural change in the Middle Ohio Valley. First, the state of theory in the Middle Ohio Valley is summarized, focusing on the tempo and mode of cultural change. This is followed by an overview of the tenets of macroevolutionary theory, which suggests that cultural change occurs in punctuated events and is influenced by factors working at multiple scales. As such, four scales of analysis are outlined, ranging from individual households and communities, to small regional patterns, to broader inter-regional patterns, to broad environmental parameters and thresholds. This chapter ends with a focus on migration and how it has been considered archaeologically, culminating in a series of archaeological expectations for migration at local and regional scales.

Chapter 3 presents the primary research questions that form the foundation of this study. These questions mirror the scales of analysis outlined in Chapter 2. Namely, questions at site, regional, extra-regional, and environmental scales seek to address issues of cultural change, contact, and migration. The questions that drive this study are (i) what is the nature of early Fort Ancient occupation at the Turpin site and how does it relate to the preceding Late Woodland component? (ii) What is the tempo and mode of early Fort Ancient village development and how does Turpin fit into this picture? (iii) What influence did Mississippian societies have on the emergence of village life in the Middle Ohio Valley? and (iv) How did changes in regional climate systems influence human behavior and cultural change in the Middle Ohio River Valley during the late Holocene (c. AD 500-1500)?

Chapter 4 provides an overview of the culture history of the American Midcontinent, focusing on the Late Woodland (c. AD 500-1000) and Late Prehistoric (c. AD 1000-1650) periods, including an understanding of Mississippian societies throughout the Eastern Woodlands. Of particular importance are questions regarding
what constitutes Mississippian and Fort Ancient societies. This chapter then narrows focus to consider these cultural periods in the Middle Ohio Valley.

Chapter 5 presents an examination of climate systems in the Midwest between AD 500 and AD 1500 in order to provide an environmental backdrop against which cultural systems changed. Using the Living Blended Drought Atlas (Cook et al. 2010), spatial and temporal differences in available precipitation are presented. Century-level and 25-year time slices are developed and analyzed in order to identify broad trends and short-term patterning in drought and moisture abundance. Focusing particularly on southwest Ohio, diachronic trends from one data point are then used to examine changes in moisture availability over time in the immediate study area. Patterns identified through these analyses are used to frame a discussion of the development of push and pull factors influencing the movement of people in this region.

Chapter 6 narrows the scale of analysis to consider the long history of excavations at Turpin and the nature of cultural deposits at this site. In many ways, these excavations helped formulate regional culture-historic models and thus played a significant role in developing the cultural sequence of this region. This overview identifies a void in understanding site structure created by judgmental sampling and a focus on burial mounds. In order to fill in this gap, a multi-stage examination into site structure at Turpin is presented, the findings of which set a foundation for subsequent fieldwork. The conclusion of this chapter reflects a reassessment of what is known about Turpin and important lingering questions influencing regional trajectories of cultural change.

Chapter 7 presents the basic methodology for identifying and excavating houses from two potential communities identified via magnetic and archaeological surveys in Chapter 6. The findings of these excavations are then presented. This includes architectural, chronological, and material culture data from these two houses. Following these findings, architecture, material culture, and chronological evidence from the two houses is compared in order to examine patterned differences between these communities. The findings from this chapter provide a detailed understanding of some of the earliest dated wall trench structures in the Middle Ohio Valley.
Chapter 8 places findings from these newly excavated houses in a broader cultural context. First, comparisons are made between early Fort Ancient sites in the Middle Ohio River Valley. Using new and published ceramic data, sites are examined and important similarities and differences are noted. Second, the scope of this comparison is expanded. Four Mississippian sites are added in order to explore the relationship between Mississippian and Fort Ancient sites occupied primarily between AD 1000 and AD 1300, which are typically considered separately.

Chapter 9 provides a discussion of major findings in broader context. Specifically, each research question is revisited in light of new findings. The nature of early Fort Ancient societies and how these relate to the movement of Mississippian people are explored. Additionally, evidence from Turpin and contemporary early Fort Ancient sites are assessed using the expectations for migration developed in Chapter 2. Finally, the relationships between environmental change and migration in this region are examined. Chapter 10 provides an overview of major findings, conclusions, and directions for future work.
Chapter 2: Theoretical Framework, Scales of Analysis, and Migration in Past Societies

This chapter outlines the theoretical approach used in the present study to understand cultural change and migration in the Middle Ohio Valley. To begin, I briefly trace the history of theory in the American Midwest and highlight some of the lingering issues faced by scholars working in the Middle Ohio Valley in particular. These include dealing with taxonomic divides, conceptualizations of cultural change, and spatial and temporal boundary areas in the archaeological record. I then outline the primary theoretical approach used in this project: macroevolutionary theory (Prentiss et al. 2009; Spencer 1997; Zeder 2009). This approach focuses on the importance of multiscalar analysis, human agency, and recognizing punctuated change in prehistory. Highlighting the significance of approaching research questions at multiple levels, I outline four scales used to analyze cultural change in the American Midcontinent. To end this chapter, I discuss the shifting stances on migration in archaeological thought. Migration plays a large role in cultural change, but identifying it in the past is often difficult. In order to test the overall results of this study in regard to the movement of people, I develop expectations for the archaeological signature of migration and set up ways to explore the causes and effects of movement in small-scale prehistoric societies.

Taxonomy, Boundaries, and Theory in the Eastern Woodlands

"We make our schemes, and if we are wise, as our knowledge of that particular set of problems increases, we change our schemes." - John Brew (1946:63)

At any given time, archaeological thought is an imperfect sum of numerous seachanges in theoretical frameworks. Although there have been many improvements in regard to how we examine and conceptualize the past, paradigm shifts leave lingering issues that escape new critiques. In many cases in North America, including the Eastern
Woodlands, the resulting situation involves a conceptual foundation set by culture-historical models, methodology and conceptually isolated cultural units from a processual/ecological approach, and an emerging comfort with socially oriented interpretations. This mixture is similar to the "processual-plus" approach described by Hegmon (2003), which represents a hybrid of multiple paradigms. Although such theoretical syncretism is preferable, issues arise when foundational cultural histories and processual isolationism are uncritically taken as truth.

Much of the foundation of North American archaeology was laid in the first half of the 20th Century in response to a wealth of data generated from large-scale public works projects and surveys in the southwest (e.g. Kidder 1924), Southeast and Midcontinent (e.g., Funkhouser and Webb 1932; Griffin 1943, 1967; McKern 1939; Philips et al. 1951), and Northeast (e.g., Ritchie 1965). In each region, these data necessitated structure in the form of cultural units, delineated in space and time. These abstract units were created through seriation and an index fossil approach to understanding diagnostic artifacts. In many ways, the work of these pioneering culture historians mirrored larger trends in early anthropological thought, including normative, essentialist models of culture (e.g., Kroeber 1952) and early ideas about the link between geography and culture (Kroeber 1947; Wissler 1927).

Taxonomic schemes developed during this early period of investigation have created foundations upon which subsequent research has been based. The processual paradigm narrowed the focus of analysis, but relied on previously defined taxa. In its most dogmatic forms, processual archaeology viewed sites as laboratories to test cultural/ecological variables while largely ignoring external influences (Trigger 2006). The addition of scientific techniques and the increased prevalence of radiometric dating shifted focus to diachronic analyses, but work often identified transitions between established taxa rather than legitimate cultural transitions. The perpetuation of key issues inherent to each perspective has led to cascading problems. Two primary concerns are relevant to the present study.

The first concern is that taxonomic systems have not only created a foundation, but a lens through which we interpret archaeological remains. Models of the past are
necessary, but a dialectic relationship must exist between models and data as new data are acquired. Instead, data are sometimes implicitly fit into predefined categories. There is a legitimate danger of reifying tenuous categories, an issue at the heart of many critiques that been leveled against taxonomic systems (e.g., Brew 1946; Lyman et al. 1997). Critical examination of such categories has helped clarify prehistoric trajectories in some regions, including the Cole Complex of central Ohio (Dancey and Seeman 2005) and the Owasco taxon of New York (Hart and Brumbach 2003). In each case, detailed review of accumulated data led to revisions of taxonomic systems; the overarching systems remain intact, but individual taxa were revised, merged with more relevant taxa, or removed entirely. The point of this section is not to rehash critiques of culture history, but to present some of the lingering issues which affect my own research questions. These critiques reflect the dangers of normative approaches and issues of cultural change in taxonomic systems. The questions that arise regard the validity of taxonomic units and whether we understand cultures and cultural change or taxa and taxonomic change.

The second issue focuses on whether or not understanding of cultural change has been hindered by the units with which we classify cultures. In many prevalent schemes change implicitly occurs at the spatial and temporal junctures of these artificial archaeological cultures (a remnant of culture history), but the tempo and mode of change is typically assumed to be evolutionary and largely autochthonous (a remnant of processualism). These issues have limited the ways in which we can interpret cultural dynamics, especially in the Midwest United States, where current taxonomies are important frameworks but in need of revision.

Early estimations of the archaeological record considered the prehistoric landscape as a series of normative cultures living in circumscribed areas analogous to "culture areas" (Wissler 1927). Within these areas, people existed in what were considered essentially identical ways, including similar subsistence practices, similar settlement patterns, and similar religious views. In this normative approach to understanding culture, people with similar traits (i.e. artifact types, settlement patterns) were considered to have been largely homogenous. One of the most dangerous issues inherent to archaeological taxonomies is the generation of normative assumptions regarding prehistoric behaviors
over large geographic areas. This was understandable when early scholars had little data to work with on regional scales; creating types and boundaries was necessary both to learn fundamental patterns in prehistory as well as to create a language with which scholars could converse (Brew 1946). Now, however, we are at a point where such types should be either verified, redefined or discarded using the large body of data now available.

The boundaries between culture areas are equally problematic, as they represent perceived cultural distinctions based on limited sets of archaeological remains. Boundaries in this system are relatively arbitrary cutoffs formed by identifiable changes in some classes of material culture. The focus thus became identifying the key elements of cultural cores at the expense of understanding cultural variation. One of the most prevalent issues alluded to here is the creation of false cultural dichotomies. This refers to the process of designating suites of characteristics as culture X or culture Y, drawing arbitrary boundaries around them (many of which become reified), and then treating these constructs as closed, independent systems. In this approach, negative elements of both culture historical and processual paradigms are evident. Relevant examples include the chronological split between Late Woodland and Fort Ancient in the Middle Ohio Valley and the spatial differentiation between Fort Ancient and Mississippian. These assumptions will be revisited later in this project.

This brief overview does not signal the death knell for the culture historical approach suggested by Lyman et al. (1997). Although I have outlined some of the issues currently faced when relying on culture historic models of prehistory, they are not insurmountable. In fact, to a large extent these models are a necessary framework for understanding the wealth of data available from over a century of excavation in the Middle Ohio Valley. They let us talk within and between regions with relative ease. My key critique is that these previous findings and interpretations should not be relied upon as de facto truths. Data and interpretive models require a dialectic relationship and the examination of multiple working hypotheses (Chamberlain 1890). Put another way, data should drive model construction and new data should be used to refine these models. In some regions like the Middle Ohio Valley, early interpretations have, to some extent,
become reified in the minds of some scholars. What are needed are flexible models that are frequently tested and revised.

This call for theoretical flexibility, model revision, and a focus on transitional periods is at the heart of the present study. The Late Woodland/Fort Ancient transition is important, but largely unclear given current information. Many hypotheses have been put forth to account for this transition (Cowan 1987; Essenpreis 1978; Griffin 1943, 1993; Pollack et al. 2002; Prufer and Shane 1970). At this point, however, the transition to an agricultural, village-based lifestyle is unclear. It cannot be denied that this shift occurred at the same time as significant transitions throughout the Eastern Woodlands (e.g., Griffin 1967); the effects of these broad-scale changes on regional and local trajectories have yet to be fully explored. This project serves as a way to reexamine past findings at one key transitional site and use targeted survey and excavation to help more fully understand it. This process brings into question the nature and validity of a long-standing culture historic taxon (Newtown Phase) and examines a transition that is otherwise considered gradual and unrelated to outside influences (e.g., Church and Nass 2002; Pollack and Henderson 2000; Pollack et al. 2002).

We leave this section with three key thoughts. First, the Middle Ohio River Valley suffers from normative culture historic taxonomic units that are in need of verification using systematic examination of extant and newly acquired data. Upon these units were imposed processual tenets of isolated autochthonous development. Second, boundaries between groups and regions do not represent strict demarcations between otherwise isolated cultural groups, but instead reflect points of contact for ideas and people and thus represent important areas of ethnogenesis and hybridization (Stein 2002). Finally, although evolutionary understanding of change is important to consider, we must not assume that all change is gradual. A range of factors, including migration and interaction, play a role in cultural change on a global scale and should be considered as important factors in this region as well. These issues lay the groundwork for the following section which outlines a theoretical stance which takes into account human agency, analyzing cultural change at multiple scales, and the possibility for abrupt changes in prehistory.
Macroevolutionary Theory and Cultural Change

The progression of theoretical paradigms in archaeology reflects, in essence, a series of attempts to determine how and why cultures change over time. Such paradigms focus on scales ranging from individual agency to the selection of cultural traits at the society level, but they invariably grapple with the issue of cultural change. Most, however, lack broad explanatory power because they fail to incorporate and integrate multiple scales of analysis. With a few notable exceptions that prove the general rule, people and societies are usually not affected solely by large-scale environmental conditions or the actions of individual people. Each of these factors, in addition to many others, including historical structures and events (e.g., Beck et al. 2007; Sewell 2005), accumulate to produce particular conditions in which cultures are altered. Consideration of these factors and scales are required to develop a broader understanding of how cultural change (both particular and general) occurs over time.

This section outlines one approach that takes into account multiple spatial and temporal scales of analysis to explain how cultures change. Macroevolutionary theory, originally outlined in archaeology by Spencer (1990, 1997) and Rosenberg (1994), has become more popular in recent years (Chatters 2009; Chatters and Prentiss 2005; Prentiss et al. 2009; Zeder 2009). Recently, Zeder (2009) published an overview of Macroevolutionary Theory and used this framework to interpret prehistoric patterns in the Neolithic Near East. This work, along with others, has helped set the foundation for contemporary macroevolutionary studies in archaeology and outlines three main tenets of this approach. First, hierarchical processes, examined at multiple scales, are imperative when considering cultural systems, interaction, and change. Second, human agency is a key element of adaptation and is thus critical for understanding the unique responses of groups to changing conditions. Finally, unlike many evolutionary frameworks, macroevolutionary theory suggests that change occurs via punctuated events, which are bracketed by periods of relative stasis. These tenets will be explored after a brief overview of the relationship between archaeology and evolutionary theory.

The emergence and application of evolutionary theory to archaeological questions is an extension of larger debates in evolutionary biology (Prentiss et al. 2009). In
particular, both biological and archaeological evolutionary scholars have split into two main camps: gradualism and transformationalism (Dawkins 1976, 1986; Eldredge and Gould 1972; Gould 2002; Spencer 1990, 1997; Zeder 2009). Differences between these perspectives focus on the tempo of change in biological and cultural systems. Gradualists hold that change occurs as a result of long-term adaptation to shifting environmental conditions that takes place over generations. Environmental change occurs at relatively low levels and species continually adapt to these changes. Transformationalists posit that change occurs rapidly as a result of punctuated events (i.e., changes in climate, environment, disease, etc.), and that between these events conditions remain relatively stable. Species thus remain relatively unchanged over long periods, but every so often, large-scale change occurs in biological and cultural systems. In long-term biological and geological history, we can see this evident in the progression of periods and epochs.

In evolutionary archaeology two schools of thought have developed, separated largely by how strictly they adhere to Darwinian evolutionary principles (Spencer 1997; Zeder 2009). Neo-Darwinian archaeology holds that the tenets of biological evolutionary theory apply directly to the study of past cultures. Spencer (1997) refers to this approach as 'selectionism,' reflecting the focus of its adherents on determining the relative selective benefits of particular behaviors. Selective advantages, in this approach, are identified by relative frequencies of particular artifact types. Variation and selection, in the traditional evolutionary sense, are applied to technological traits. It is assumed that the most efficient technologies conferred a selective advantage and were thus reproduced over time. Selectionist archaeology relies primarily on gradual models to explain cultural change in prehistoric systems.

The second school of thought in evolutionary archaeology is referred to as macroevolution. Spencer (1997) originally referred to this approach as 'processualism,' highlighting its roots in the emerging processual paradigm, which at the time was theoretically eclectic and largely unorganized. However, the syncretism exhibited by processualists led to a variety of viewpoints. In general, adherents to this approach viewed culture as "a system populated by willful human actors who are organized into a nested set of organizational levels, such as the family, lineage, village, and regional
polity" (Spencer 1997:211, italics added). Here we see both the importance of agency and the emergence of the multiscalar perspective stressed by more recent macroevolutionary approaches. Additionally, cultural change is seen as a complex shift that not only includes changes in trait frequencies, but also the transition to "qualitatively different strategies" (Spencer 1997:211) in cultural systems. These changes are often accompanied by changes in the relationships between organizational levels. It is in this framework of qualitative shifts in the scales that constitute cultural systems that the macroevolutionary focus on punctuated change can be seen. These three principles, agency, hierarchical processes, and punctuated change, form the foundation of contemporary macroevolutionary theory (Zeder 2009).

Instead of the phenotype analog and artifact-frequency-as-adaptation approach of selectionists, macroevolutionary archaeologists view cultures as "constellations of interacting traits, whose form is shaped as much by historical contingencies and constraints to change as by the specific adaptive attributes of individual cultural behaviors" (Zeder 2009:7). The general theme of behaviors as adaptations remains an important element of cultural systems in macroevolutionary approaches, but cultural development is viewed as being guided by particular historical events. This stance fits well with broader social theory regarding the importance of historical structures in cultural change (e.g., Sewell 2005). In many ways, it is similar to discussions of complex design in evolutionary biology in which the adaptive history of a species sets constraints on new adaptations and to some extent shapes what future adaptations are possible (e.g., Dawkins 1986).

Culturally-specific constellations of traits are referred to as baupläne, after the evolutionary term referring to morphological design suites of species at different taxonomic levels (Prentiss et al. 2009; Rosenberg 1994; Zeder 2009). Importantly, as taxonomic scale increases, series of more generalized baupläne emerge; this hierarchical perspective is relevant to studies of cultures as well. As Zeder (2009:7-8) points out, scholars define what constitutes a bauplan differently. In general, they are considered "the basic designs that organize linked constellations of cultural traits into coherent and enduring forms" (Zeder 2009:7), meaning they represent the cultural whole, or the logic
that allows seemingly disparate cultural elements to work together in a coherent system. Three understandings of cultural baupläne are evident in the literature, and focus on the human/environment interface (Chatters and Prentiss 2005), the overall ethos or structure of a society (Rosenberg 1994), or the general sociopolitical framework of a society (Spencer 1997).

Rosenberg (1994) was the first to describe cultural baupläne, suggesting they reflect "a design structure...a means of maintaining a reservoir of knowledge useful on all scales of cultural formations" (Prentiss et al. 2009:5). In this sense, baupläne are the focus of examination in macroevolutionary approaches. Zeder (2009:8) goes on to suggest that Rosenberg's baupläne represent "the ideational structure or ethos of a culture that provides the highest-order, most conservative organizational framework for a culture" (Zeder 2009:8). In this definition, it is implied that beyond typically considered adaptive elements, a society's ethos is an integral part of its bauplan. Typically 'epiphenomenal' traits like ritual and religion are thus important elements of a cultural bauplan, as they influence peoples' decision making and often provide a significant portion of the logic of cultural systems.

The pace of cultural change posited by macroevolution is perhaps the most important aspect of this paradigm. In biology, macroevolutionary theorists largely eschew the importance of change on the individual level (i.e. allele frequencies) and consider species as relatively static until large-scale change occurs, typically catalyzed by external forces. This paradigm has been labeled punctuated equilibrium (Eldredge and Gould 1972, 1997; Gould 2002). In studies of culture, macroevolutionary theorists suggest that "change from one bauplan to another proceeds as a punctuational process in which periods of rapid transition are followed by long periods of relative stasis" (Zeder 2009:9-10). In this perspective, periods of stasis in the archaeological record, often suggested to be an artifact of incomplete records, instead reflect periods of stable conditions. Considering that cultures are generally conservative, norms are actively maintained during these times (e.g., Rosenberg 1994). Change occurs rapidly, often well beyond typical archaeological resolution. However, change, which is often externally catalyzed, can be identified by the transition from one set of norms (or bauplan) to another;
archaeological signatures should appear quite different before and after these punctuated events. It is important to note that much like in biological change, historical structures matter.

In essence, change occurs in a form of cultural punctuated equilibrium. The events that catalyze change can occur at and appear differently at multiple levels (e.g., warfare or migration incited by environmental instability), and thus are best examined hierarchically. There is little consensus on what factors elicit changes in cultural systems, but it is likely particular to a given situation. Chatters and Prentiss (2005) suggest that periods of plenty are likely to elicit changes, since many socioeconomic strategies become viable and competition can foster the development of new cultural systems. Alternatively, Rosenberg (1994) suggests that periods of stress (i.e. environmental, demographic) can instigate changes in cultural 'superstructures' ("basic conceptual underpinnings or belief systems" [Zeder 2009:9]). Spencer (1997) suggests that both times of stress and plenty can catalyze systemic change in sociopolitical arenas. Transitions at this scale occur when people elect to give up autonomy to higher levels of organization (i.e. chiefdoms or states). I would also add that migration of non-local groups into a region may act as a catalyst for cultural change, both among migrants and local populations (e.g., Zvelebil 2001).

An important and relevant case study applying macroevolutionary theory is Zeder's (2009) handling of the Neolithic transition in the Near East. This overview highlights the importance of Childe's 'Neolithic Bauplan' in this region. This cultural framework incorporates changes in social organization, religion and ideology, and the diffusion of Neolithic cultural elements through interregional contact and the movement of farming communities. An important aspect of Childe's concept of a Neolithic Package is that, contrary to many critiques of the concept, this package was processual in nature. As Zeder (2009:39) suggests, "Childe clearly did not conceive of the constituent components of the Neolithic bursting forth fully formed as a complete package. Instead, Childe saw these different components as mutually reinforcing parts of an unfolding process." What we have, then, is a process of domestication, sedentism, social integration, religious development, and the movement of people all co-developing over a relatively short
period, marking the transition from a foraging bauplan to that of a Neolithic farming bauplan. As populations spread, this general bauplan spread with them. This is a concept that will be returned to when interpreting the spread of maize-based farming communities throughout the Midwest.

**Working at Multiple Scales of Analysis**

To fully consider cultural change in the past, both internal (i.e., social dynamics, historical structures, traditions) and external (i.e., environmental change, interaction, migration) factors must be examined together in broader social, historical and ecological context. Integration of this nature is contingent upon understanding that multiple spatial and temporal scales exist at which events occur and are linked (Braudel 1980; Kowalewski 1995; Peregrine 1995). Examining cultural dynamics using a multiscalar framework is thus important for holistic examination of human behavior. This project seeks to set the foundation of such an approach in a small region. By starting at the level of one multi-component prehistoric community (Turpin) and using multiscale of archaeological investigation, this community can be more fully understood in terms of structure and chronology. By then considering multiple social, geographic, and environmental scales at which events occurred, the processes involved in cultural change can be clarified.

In its most basic sense, scale can be meaningfully thought of as a series of spatial linkages between the local and the global, each influencing those above and below (Harris 2006). The scale at which analysis occurs is called effective scale; it is “the scale at which pattern is recognized and meaning inferred, to chart temporal, spatial and cognitive differences” (Crumley 1995:2). Interspersed levels can be considered in terms of hierarchy theory, which frames scale as a series of vertical and horizontal structures (Harris 2006:41). The result is a series of nested effective scales, each of which is contingent upon, but analytically distinct from one another. The idea of a composite perspective comprised of multiple scales fits well with macroevolution's requirement to understand hierarchically organized levels within societies.
Four scales of analysis were developed through which the present study will be conducted. These scales, outlined below, are largely limited to their own scalar context (i.e., site, region, etc.); in order to bridge them, these scales must be meaningfully linked. Linkage is perhaps the most important question of scalar phenomena such as human action (Harris 2006). It refers to the need to generate comparative associations between levels of analysis, either contextually (high to low) or in an aggregative (low to high) sense. As Kowalewski (1995:148) notes, because "different causes operate at different spatial and temporal scales, a single paradigm will have strengths in some areas but fatal inadequacies in others." As such, asking questions that involve multiple scales requires the incorporation of the strengths of multiple paradigms. Theoretically syncretic approaches are the best way to understand and integrate broad transformative patterns as well as local processes of culture change (Kowalewski 1995; Peregrine 1995; Zeder 2009).

Since this study involves dynamics created by contact between local and non-local groups of people, it is necessary to understand the inherent scales involved in cultural interaction. Interaction between groups is best analyzed from at least two perspectives. Stein (2002:907) notes that in order to avoid perspectives which give primacy to interregional interaction (e.g., traditional world systems theory), approaches must seek to look at a given situation using both a "top-down perspective," which includes the cultural network in question and those groups which participate in it, and a "bottom-up perspective," which includes those households, communities, and social groups that comprise each network. Taken together, these perspectives provide a framework for understanding different analytical scales and how they can be linked.

Macroevolutionary theory, which promotes theoretical syncretism for examining different scales of analysis, fits well with these requirements. As such, I draw on aspects of (i) identity and hybridity theory, which is useful for understanding ethnogenesis in situations of culture contact and migration at the site-level (Alt 2006; Appadurai 1990; Bhabha 1990), (ii) a concept of rapid environmental change and thresholds, which are not often considered in archaeology but is playing a growing role in ecosystem and climate change research (Alley et al. 2002), and (iii) considerations of migration at multiple
scales. The four scales outlined below allow for interpretation of findings at multiple levels, ultimately transcending artificial archaeological boundaries in the search for meaningful patterns.

Scale 1 - Environmental Parameters and Thresholds

Human behaviors occur within basic environmental parameters. These parameters influence factors such as subsistence (i.e. what will grow or what foods are available?), settlement (i.e. do people need to move to resources or can they move resources to them?), and seasonality (i.e. when are foods available? is settlement seasonally differentiated?). However, it is uncommon that these parameters are stringent; instead, they allow for considerable variation in behavior, even in nearly identical environments. Understanding long-term climatological change allows cultural interpretations to be nested within shifting environmental parameters. Although some scholars favor models that predict human responses based on hypothetical environmental conditions (e.g., Kelly 2013; Winterhalder 1981), it is perhaps better to envision human behavior as complex and contingent upon a combination of interacting social, historical, and environmental variables (e.g., Prentiss et al. 2009; Zeder 2009). In this sense environmental change may be best considered in regard to its affect on human behavior in terms of thresholds, which are defined as "the point at which there is an abrupt change in an ecosystem quality, property or phenomenon, or where small changes in an environmental driver produce large responses in the ecosystem" (Groffman et al. 2006:1). Within certain technological and historical constraints, behaviors are relatively free to vary; after environmental thresholds are crossed, people and societies are forced to adapt (e.g., Rosenberg 1994). When climate change is rapid (i.e. on the level of one to two generations) and thresholds are crossed, human behavior on the social level can change dramatically, resulting in shifting cultural baupläne.

An example that illustrates this concept on a broad scale is that of an environmental threshold at the end of the Pleistocene in the Near East. Richerson et al. (2001) suggest in a broad sense that the threshold encountered at the beginning of the Holocene resulted in ameliorative conditions in which agriculture became a viable adaptation. By identifying
the climatic threshold and broad cultural response, the authors provide a compelling case for the relationship between climate change and cultural change. This case is not deterministic (i.e. that warmer, wetter conditions invariably produce agricultural responses), but instead traces the responses of particular communities living in an area in which a climate threshold was surpassed.

As this and other examples suggest, environmental thresholds can structure the parameters within which social actions occur. In this sense, behavior is governed not only by the recursive relationship between structures and agency (e.g., Giddens 1984) but also by environmental change, which at broader scales becomes a structuring agent in its own right. It is important to understand not only how cultures change in terms of practice, structures, and structuration, but also how changes in broader ecological contexts can influence everyday practices and broader social structures.

Paleoenvironmental reconstructions are sparse for the Middle Ohio Valley, especially those which include the period from AD 500-1500. Multiple available examples provide partial reconstructions for small areas based on one proxy (e.g., Abrams et al. 2014; Wurster and Patterson 2001), but highlight the need for more systematic and/or synthetic work in this region. At a broader scale, multiple proxies are available to create an overview of the paleoenvironmental context of the greater Midwest. Specifically, both speleothem (e.g., Hardt et al. 2010) and Palmer Drought Severity Index (PDSI) data (Benson et al. 2009; Cook et al. 2004; Cook et al. 2010) provide insight into the time periods in question at the continental scale. However, it should be noted that these types of data serve only to recreate past temperature and moisture regimes; extrapolating to causes of human behavior can be problematic (e.g., Benson et al. 2010). It is for this reason that the present study focuses on general trends and potential thresholds in the ecological systems of this region. These data are then used inductively to provide a general backdrop against which social change occurred between AD 500 and AD 1500 in the Middle Ohio Valley.
Scale 2 - Communities and Households

To understand the relationship between broad trends and local developments in prehistory, analysis begins with consideration of communities and their constituent parts. This reflects the "bottom-up" approach suggested by Stein (2002:907), in which increasing scales are used to understand cultural interaction and change, starting at the smallest social institutions. In the archaeology of small-scale societies, this is largely mandatory, considering our understanding of prehistory is derived from excavations at this level. Households and the communities which they constitute are in many ways the basic social and economic units of society (Birch 2012; Douglas and Gonlin 2012). They also represent the foundation upon which subsequent investigations depend. It is thus critical that well-excavated sites focused on site structure and habitation contexts are used to create reliable datasets before moving up in scale to explore regional patterns.

Communities

Communities are a critical but understudied element in the investigation of past societies (Yaeger and Canuto 2000:4). Village communities are often an important element of an agrarian lifestyle and represent a fundamental setting of social interaction (e.g., Wilk 1984). Although archaeologists are beginning to study communities as social institutions in greater detail (e.g., Cook 2008; Kolb and Snead 1997; Means 2007), they have not received similar attention in anthropological discourse when compared to other social institutions like households (Yaeger and Canuto 2000). A common working definition among anthropologists is that communities are "the maximal group of persons who normally reside together in face-to-face association" (Murdock 1949:79), although this reflects a synchronic conflation of communities, villages, and among archaeologists, the concept of "sites" (e.g., Means 2007). Each represents something unique; a more nuanced definition of communities is required.

Kolb and Snead (1997) identify three elements fundamental to communities: social reproduction, subsistence production, and community self-identification. These are "three irreducible elements of human communities…[which] combine to create a sense of 'place' that is intimately linked to community identity" (Kolb and Snead 1997:611). In
essence, communities are intersections of economy, identity, and ritual that members mutually recognize and contribute to. Typically, they are spatially linked to villages, but can reflect more nebulous social groupings which account for connections between villages and across regions (Means 2007:32).

Yaeger and Canuto (2000:2-3) suggest that conceptualizations of the community in archaeology fall under three main theoretical paradigms. These are (i) historical-developmental, which places the development of communities in historical and social context, giving primacy to external influences, (ii) ideational approaches, which frame communities in the sense of the creation and negotiation of identity, and (iii) interactional approaches, which suggest that the everyday relationships between people are what create and structure society. The authors go on to suggest that "a modified interactionalist paradigm, informed by practice theory, holds the most promise for understanding communities" which they suggest are "dynamic socially constituted institution[s] that [are] contingent upon human agency for its creation and continues existence" (Yaeger and Canuto 2000:5).

While a legitimate definition of communities must involve concepts of identity and agency, the above definitions eschew the influences of history and broader interaction on community formation, continuity, and change. Reflecting an issue noted above from Stein (2002), the authors implicitly lend primacy to an internal form of cultural change (practice theory), while largely excluding extrinsic factors (history and interaction). Interaction has been shown to lead to changes in settlement patterns in contemporary groups, resulting in increased sedentism, the development of villages and the reorganization of communities (Hitchcock 1982; Stasch 2013). Hitchcock (1982) identified a process he called "secondary sedentism," in which contact with village communities prompted the emergence of sedentism among traditionally mobile groups. It is safe to assume similar processes acted in the past; interaction and population movement are becoming increasingly recognized as significant elements in prehistory (e.g., Stein 2002). Although external influences are indeed negotiated through the lens of a particular culture, they are nonetheless influential and should be taken into
consideration; to do otherwise would be to make the mistake of considering communities as relatively closed systems, and change as primarily internally-driven.

An important element of the analysis of archaeological communities is that sites can represent complex social situations (e.g., Cook 2008). A single archaeological site may contain evidence of multiple cultural communities or ethnicities. This is particularly important in times of rapid cultural change, in which populations often merge into so-called coalescent communities (Birch 2012; Kowalewski 2006). Coalescence is a generative process that creates novel social, ideological, and economic (to name a few) elements in a society (Birch 2012). This process also creates new issues related to scalar stress (sensu Johnson 1982), that are often alleviated through new arrangements in ritual, feasting, symbolism, and other methods of community integration (Birch 2012:649-650; Byrd 1994, 2005; Kuijt 2000). Understanding prehistoric communities in this multi-ethnic, in-progress sense is critical to understanding how people interacted.

Such intra-community dynamics are an understudied but crucial aspect of how people lived (Canuto and Yaeger 2000). Community ritual represents one avenue into understanding aspects of identity formation, integration, alleviation of scalar stress and links with other communities utilizing similar forms of ritual (e.g., Cohen 2010). Within early village communities, shared ritual experiences are thought to have been one way in which scalar stress was alleviated. As villages got larger or people coalesced into villages, crowding, lack of privacy and competition likely generated social stress (Bandy 2004; Johnson 1982; Kuijt 2000). Integrative rituals, often organized around communal facilities like plazas (e.g., Rautman 2000), were one way to bring people together to mitigate stress. Novel social arrangements, which cross-cut households, families, and lineages, also served as ways to mitigate incipient social inequality. In these new village communities, "social arrangements are organized to cross-cut kin and household lines, thereby reducing interpersonal tensions and conflicts over authority. The reorganization of these social relationships and authority, therefore, can serve as a situational response to short-and long-term population-related problems” (Kuijt 2000:78). As such, communities are seen as a sphere within which many historicizing elements, such as identity formation, ethnogenesis and ritual integration, are continually codified.
Taking these myriad elements into account, a more inclusive definition of a *community* is 'a social institution reflecting shared ideals that is created and enacted through human interaction, incorporating contingent histories as well as external influences.' In this sense, communities are groups of people whose interpersonal interactions, economies, rituals, histories, and contact with non-local groups merge to foster a sense of shared identity. The negotiation of traditions and cultural contact thus play an important role in shaping the avenues of human action and senses of identity.

The communities examined in the present investigation are those that occupied the landform on which the Turpin site is located throughout the Late Woodland and Fort Ancient periods. The changing practices of these communities over a millennium present opportunities to address both synchronic (i.e. what was the nature of Late Woodland Fort and Ancient occupation at Turpin?) and diachronic (i.e. how did practices changes between the Late Woodland and Fort Ancient occupations? What caused these changes?) questions. Multiple stages of this investigation are devoted to identifying and characterizing evident communities at Turpin. Excavation data, including that of material culture, site structure, and household architecture, will be used to characterize dynamics at Turpin both synchronically and diachronically to help better understand the communities that occupied this area. Findings will then be compared with other early Fort Ancient villages and early Mississippian communities throughout the Midwest and Southeast with the goals of a) characterizing early Fort Ancient/Mississippian communities and settlement systems and b) tracing meaningful similarities that point to aspects of shared community identities.

*Households*

Although village-based communities are often the largest socioeconomic unit in small-scale societies (Birch 2012; Kolb and Snead 1997), they are composed of households, which represent the fundamental socioeconomic unit in such societies. Households, while their own units of analysis, also represent "portals to understanding larger communities" (Douglas and Gonlin 2012:8), in that working between household
and community levels of analysis provides a more complete picture of social dynamics at these levels.

Households can reflect social units that are typically inhabited by nuclear or extended family groups, and have unique histories, relationships, and goals (Wilk and Netting 1984). They are also physical sites where people slept, prepared meals, ate, interacted, and performed other domestic activities. As such, analyzing the physical, social, and economic spheres of household activity (after Wilk and Netting 1984) and their relationship to the broader community can help shed light on identity and practice, particularly in multi-ethnic communities. Pluckhahn (2010:332) defines households as “social groups with a material presence, defined not only by buildings but also by the remains of routine activities and habitual practices” (332), taking into account both social and domestic elements of these structures. He also notes that it is important to move away from the common households-as-building-blocks approach, toward an understanding of households as active locations where culture is enacted and reinforced.

In an ethnographic synthesis of households, Wilk and Netting (1984) suggest that the activities typically involved in households can be summarized in five categories: production, distribution, transmission, reproduction, and co-residence. These are not mutually exclusive categories, but instead are described as overlapping "spheres of activity" (Wilk and Netting 1984:5). Three of these spheres, production, distribution, and reproduction, are particularly relevant to archaeological analysis of households since our data are more germane to their study. Production, which is defined as "human activity that procures or increases the value of resources" (Wilk and Netting 1984:6), involves the economic facets of household activity. More simply put, production is what households do (Douglas and Gonlin 2012). Distribution consists of "moving material from producers to consumers...and includes consumption" (Wilk and Netting 1984:9). Generally, this refers to the set of rules governing intra-household exchange, and includes pooling of resources and labor. Reproduction, while including biological aspects difficult to analyze archaeologically, also includes social reproduction (Douglas and Gonlin 2012:4). This includes household ritual, which is often founded in family traditions and histories. Regarding Mississippian household ritual, Pluckhahn (2010:360) suggests that
“...household and descent groups were corporate entities that owned or controlled property, coordinated activities, and shared traditions” and that families would have had an interest in linking themselves to past ancestors and continuing these unique identities. Each of these three spheres of activity can be explored archaeologically through excavation and analysis of material culture.

Household architecture, as a physical manifestation of family units, portrays active symbols of ethnicity and identity (Alt 2006; Alt and Pauketat 2011; Pluckhahn 2010; Watkins 2004). In the case of Mississippian societies, wall-trench architecture is thought to have been a tangible representation of a Mississippian ethos and an indicator of ethnic differences. In regard to the spread of Mississippian farmers, Pluckhahn (2010:366) suggests that "wall-trench architecture is invoked as a critical element of the ‘cultural blueprint’ carried by these Middle Mississippian ‘pioneers’" (366). Peripheral farming sites in the uplands around Cahokia (Richland Complex) have produced hybrid wooden post/wall-trench structures. These structures have been interpreted as a reflection of ethnic hybridity (Alt 2006). In essence, wall-trench structures, apart from being an efficient way to construct houses, reflect connections to a broader Mississippian sphere. Households thus represent an important indicator of ethnicity and identity throughout the Late Prehistoric period Eastern Woodlands.

In this study, physical Fort Ancient houses are examined in order to produce material culture relevant to prehistoric domestic tasks (or spheres of activity), information on architectural style, and chronological data in two distinct communities. In addition to the structures identified in previous work at Turpin (see Chapter 6), two potential structures will be excavated and analyzed as part of the present study (see Chapter 7). Anticipating Scales 3 and 4 discussed below, broader comparisons are made between Turpin, Guard, and State Line, three well-documented early Fort Ancient sites, as well as between early Fort Ancient houses and those in contemporary Mississippian communities (e.g., Angel, Cahokia, Hiwassee Island). These comparisons will highlight similarities and differences at the household level at the scale of the site, the region, and the broader Mississippian system.
Scale 3 - Region of Communities

Regions have long been a key analytical unit in archaeology (e.g., Fish and Kowalewski 1990; Johnson 1977; Kohler and Varien 2012; Philips et al. 1951). This is particularly true in terms of small-scale societies composed of village communities (e.g., Bandy 2004; Birch 2012; Heckenberger et al. 1999). Within a region of villages it is important to understand differences and similarities between communities that constitute a shared cultural system. In many ways, this is similar to McKern's (1939:308) taxonomic unit of a Focus, which is defined as "that class of culture exhibiting characteristic peculiarities in the finest analysis of cultural detail, and may in instances correspond closely to the local tribe in ethnology." Although such taxonomic systems have issues (e.g., Brew 1946), contemporary sites in a region that have consistent structure, architecture, and material culture represent a legitimate analytical grouping. Examination of regional trends can help illuminate how communities interacted economically and how movement among communities contributed to a relative homogenization of these groups. Diachronic trends can also point to processes of village fissioning (e.g., Bandy 2004) and regional coalescence (e.g., Birch 2012; Drooker 1997; Kowalewski 2006). Household architecture, village structure, integrative facilities and mortuary traditions represent productive avenues of comparison between village communities within a region.

In a cross-cultural analysis of prehistoric villages, Bandy (2008) identified three systems or types of village settlements. Type 1 villages exist as autonomous communities in a system of essentially equivalent villages. The second type (Type 2) involves the development of a settlement hierarchy, in which some villages become the centers of chiefdoms while other tributary villages remain small. Type 3 villages represent a scenario in which agriculture and village life arrive from outside of the region in question, being a result of diffusion or migration. This occurs "when agriculture arrives in a region as a result of demic diffusion and the source region for the immigrants is already characterized by the presence of large villages. In this special case, therefore, the date of the agricultural transition and the date of the appearance of large villages are the same, large villages not having developed locally but arrived as part of the cultural package of a migrant group" (Bandy 2008:338). In essence, Type 3 villages are the result of Neolithic
expansion. This situation, Bandy notes, is rare archaeologically and in need of further study.

Regional patterns of village development and history provide a framework for understanding groupings of contemporaneous archaeological sites in a small region. They reflect three potential historical processes by which village development could have occurred. The first, which is by far most common, involves autochthonous development, likely over long periods of time, in which people aggregated into larger communities. In this case we should expect to find long histories of development in a region, and continuous change in artifact forms, community arrangements, architecture, and population. The second involves the development of social inequality and the organization of settlement hierarchies like those seen in some Mississippian polities. Expectations include dichotomous settlement types (centers and rural communities), and differences in material culture and settlement organization. The third type of village community relies on the historical process of migration as a mechanism for the emergence of villages. In these regions, prior to the appearance of villages, populations were either non-existent or relatively mobile. In this case, villages have little association with local traditions. Expectations include distinct differences between local material culture, settlements, mortuary traditions, and architecture and that of the newly founded villages. These types of communities and their archaeological signatures are used in the development of research questions for the present study. The processes involved in migration and their archaeological correlates are discussed in the next section.

The region of communities addressed here is the early Fort Ancient component of the Ohio-Indiana-Kentucky tri-state region. This area includes the Great Miami Valley, the Little Miami Valley, and the Whitewater Valley, (Figure 4.1). Although encompassing a large area, only three early Fort Ancient villages are known in this region: Turpin, Guard, and State Line (Cook 2008; Cook and Comstock 2014; Cook et al. 2015; Vickery et al. 2000). Each has been systematically investigated with the exception of State Line (Cook 2008; Vickery et al. 2000). A recent project has produced numerous new radiometric dates these and other sites (Cook 2014), making Turpin (n=18), Guard (n=15) and State Line (n=13) some of the best dated villages in this region. Guard was
investigated with a focus on community structure and household architecture (Cook et al. 2015; Cook et al. n.d.), making it a prime comparison to the present work at Turpin. State Line, however, has the unfortunate distinction of being the most looted site in the region and as such comparisons are more problematic. However, using the few published accounts of archaeological work at the site (Vickery et al. 2000), provides a baseline comparison to work at Turpin.

Using these three sites, which Cook and Comstock (2014) have shown based on radiocarbon and diagnostic artifact data to be the earliest Fort Ancient villages in the region, the nature of early Fort Ancient village life will be characterized at the scale of a small region. In order to consider other early Fort Ancient villages in the Middle Ohio Valley, three additional sites in Kentucky will be considered: Thompson (Henderson and Pollack 1992) in northern Kentucky, Dry Run (Sharp 1984) in central Kentucky, and Muir (Turnbow and Sharp 1988) in the central Bluegrass Region of Kentucky\(^1\). The amount of fieldwork conducted at these sites varies and generally did not focus on questions of site structure and community organization like Guard and Turpin. However, findings are sufficient to compare these early sites in a basic sense.

**Scale 4 - Broad Regions**

A consideration of broad trends beyond the regional level incorporates a scale which includes multiple regions, approximating what may be considered culture areas (\textit{sensu} Wissler 1927). At this scale, phenomena are necessarily generalized and the particular histories of communities and small regions leave focus, but the broad technological and ideological trends recognized here undoubtedly influenced peoples’ lives at lower scales. Three primary considerations are important at this scale: economic connections, technological innovations, and ideological bonds.

Economic relationships were an important aspect of past societies (e.g., Sahlins 1974). Considerations of how goods and ideas moved between regions, especially in terms of how (direct contact vs. down-the-line trade) and what goods (utilitarian vs.  

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\(^1\) These sites were added to the study based on critiques of my NSF grant, which suggested that I was mischaracterizing the early Fort Ancient period by not including information from these small sites, which fit prevailing models of cultural development in the region.
ceremonial) can help highlight the nature of cultural interaction. Directionality of trade in these senses is important as well. Unidirectional movement of ceremonial goods from a core to peripheries, for example (e.g., Hall 2000; Kelly 2000), may indicate an attempt to integrate peripheral populations. A common approach in world systems analysis has been identifying and tracing prestige goods economies (e.g., Brown et al. 1990). In these systems, elites are thought to have garnered power from access to exotic, prestigious goods and competed with other elites to secure access to more resources and thus achieve higher status.

Univariate considerations of one-way core-periphery interaction on an economic level or prestige goods economies have given way to more nuanced views on interregional interaction and peer-polity relationships (e.g., Chase-Dunn and Hall 2010; Peregrine 1995). In the case of a Mississippian system, Peregrine (1995:258) suggests that these societies "...existed in a multidimensional, multilocal lattice of political, military, economic, and ideological bonds, all functioning within a world-system founded on an economic interdependence." In this sense, the interrelationships between Mississippian polities, and central and peripheral Mississippian groups, while underlain by economic ties, also incorporated sociopolitical and ideological elements. This complex 'lattice' begins to transcend the concept of an economic system, approximating the concept of a Mississippian ethnoscape (Pauketat 2007) as described below.

The spread of technology across regions is also critical to understand at this scale. As an example, the spread of a system of maize agriculture is coupled with the process of Mississippianization (sensu Pauketat 2002) in many regions. Understanding how and why maize spread and also how agricultural practices changed (e.g., Scarry 2008) could illuminate issues of the spread of packages of material and ideological goods. Although it is not always a popular sentiment, support is growing for a Mississippian 'package' which spread throughout the major river valleys of the Midwest and Southeast after AD 1000. This package includes shell as a tempering material in ceramics, large plain globular vessels, wall-trench architecture, and maize agriculture. It must be stated that the individual histories of each of these technologies is varied and each does not necessarily have its genesis in the Mississippian emergence (e.g., Feathers and Peacock 2008). The
important aspect here is how these individual technologies were incorporated into what we consider 'Mississippian' culture and subsequently spread throughout much of the region. On a smaller spatiotemporal scale, this is quite similar to how Zeder (2009) envisions the development of Childe's Neolithic package in the Near East. Much like Özdoğan (2008) noted in Europe during the Neolithic transition, this change is time-transgressive and a distance-decay relationship existed in which items fell out of the package or local variants emerged further from the original source. It is against this backdrop that cultural change occurred in many areas throughout the American Midcontinent after AD 1050.

Appadurai's (1996:33) concept of 'ethnoscapes' provides a productive framework for understanding social connections over large distances. Ethnoscapes are landscapes comprised of the various individuals and groups of people that move throughout an area. They include a shared mentality that cross-cuts space as a result of movement, a gestalt composed of ideas that are interpreted by groups and individuals. The Mississippian ethnoscape (Pauketat 2007:85) is constituted of numerous characteristics, ranging from agricultural village life and a shared site grammar (Cook 2008; Lewis et al. 1998), to "the ties of ritual and symbolism that linked Mississippian societies participating in the Southeastern Ceremonial Complex" (Peregrine 1995:258). This mixture of economic and ideological components was enacted, perpetuated, and reinterpreted by groups and individuals throughout the Mississippian world. The movement of people throughout this region, which at this point is becoming well documented (e.g., Blitz and Lorenz 2002; Cook and Price 2015; Delaney-Rivera 2004), was one mechanism through which this shared ethos was spread and reinforced, and a Mississippian ethnoscape solidified.

In order to understand the nature of early Mississippian societies, four sites are used in a broad comparison that builds on the early Fort Ancient characterization outlined above. These Mississippian sites include Angel (Black 1967), Hiwassee Island (Lewis and Kneberg 1979), Prather (Munson and McCullough 2004), and Annis (Hammerstedt 2005). Patterning in ceramic assemblages, including surface treatment, tempering material, and design elements will be used to compare and contrast both plain and decorated ceramics from these sites. These data will help form a baseline to compare
early Mississippian communities with early Fort Ancient settlements in the Middle Ohio Valley.

Bridging Scales of Analysis

As I have suggested, analysis of cultural change must occur at multiple scales. Connecting these scales in meaningful ways is difficult but necessary. Lock and Molyneaux (2006:8-9) suggest that in order "to understand a complex multi-scalar situation, the analyst must identify individual phenomena at a particular time-space scale and investigate how they relate to each other and combine to influence phenomena at lower and higher scales." In the case of the present study, linkages from the scale of households and communities, to regions of communities, to broader regions or ethnoscapes are created primarily through characteristics including chronology, material culture, architecture, and site structure/grammar. In this case, bridging also builds on biological studies focused on tracing the movement of individuals within and between regions (Cook and Aubry 2014; Cook and Price 2015). Patterned variation in material culture and biological evidence is then used to infer links between local communities, regions of communities, and broader areas. Although beyond the scope of this project, further sourcing studies of ceramics, pipes, and other geographically specific items should be explored in order to test the ties identified here and to explore new connections.

Material culture has long been used to create typologies and infer cultural relationships (e.g., Childe 1934). This is particularly true in terms of ceramic production and decoration, which provide useful venues for inter-site comparisons both within and between regions. Pioneering culture historical work (e.g., Griffin 1943; Philips et al. 1951) highlighted the ability of both technological attributes (i.e. shell tempering) and stylistic attributes (i.e. vessel design and shape) to inform on cultural contact and migration. Consideration of less commonly examined utilitarian ceramics can also provide new insights (e.g., McGill 2006), although studies of utilitarian wares in the Middle Ohio Valley are only beginning to be conducted (e.g., Schulenberg and Cook 2015). Using (and refining) long-standing typologies, material culture from Turpin will be described and classified, with particular attention paid to regional and inter-regional
connections. In particular, patterned variation in ceramic production and decoration at Turpin will be used to link this site with other sites in the Middle Ohio Valley and beyond.

Although not often used in comparisons between different groups, domestic architecture has the potential to provide unique insight into cultural systems as well as cultural continuity and change. The conceptualization of what constitutes a house and how to build a house are culturally determined and socially important (e.g., Watkins 2004). Alt and Pauketat (2011) consider Mississippian wall trench architecture to be as much symbolic as technological. The importance of this construction method speaks to participation in a broader Mississippian system and can be used to trace links between geographic areas, and in the case of this study, scales of analysis. Placing these findings in the context of the spread of wall trench architecture (Alt and Pauketat 2011; Pauketat 2007) provides an understanding of where Turpin and early Fort Ancient sites in general fit within the spread of Mississippian culture. Coupled with diachronic changes in how long houses were used, examining architecture between local sites as well as in a broader regional perspective can provide important linkages.

Through use of nested comparisons of the characteristics detailed above, the scales of communities, a region of communities, and the broader Mississippian system can be linked and studied in broader context. Coupled with migration data, these lines of evidence can provide links between local and regional patterns. It is through this approach that assumptions from longstanding cultural taxonomies (i.e. that Fort Ancient is patently different than Mississippian) can be examined and we can begin to work beyond assumed cultural and geographic boundaries. The following section provides a deeper understanding of migration as a potential link between scales of analysis and an important catalyst of cultural change.

**Identifying Migration in the Archaeological Record**

The movement of people, both on small and large scales, is an important element of the human species (e.g., Bellwood 2004, 2014). In the historic period, it has shaped the evolution of empires and countries (Hoerder 2002). In the contemporary world, migration
has become the issue of a generation, whether it is migrants fleeing famine and war in Africa (e.g., Reuveny 2007) or drought and political corruption in the Middle East (Gleick 2014; Kelley et al. 2015). Although it is easy to consider migration as a relatively modern phenomenon related to colonialism and globalization, large-scale movement was common in many prehistoric societies (e.g., Anthony 1990; Cameron 2013; Bellwood 2014; Rouse 1986). We should not consider past groups as static and relegate them to a 'savage slot' (Cobb 2005). Although migration has long been a part of archaeological inference (e.g., Childe 1950; Thompson 1958; Rouse 1986), its relevance has changed in accordance with theoretical paradigm shifts. In order to more fully understand migration in form and process throughout prehistory, an overview of archaeological considerations of migration and how it relates to cultural change is presented. This overview sets the stage for an exploration of indicators of migration in the archaeological record on multiple scales, tying in with the concepts of macroevolutionary theory and multiscalar analysis outlined above.

Human societies exhibit many types of movement, among which migration refers to a particular variety. Seasonal mobility or transhumance typically occurs over relatively short distances in a home range (Bellwood 2014), while social mobility reflects the movement of people over short or long distances for marriage relocation (Hoerder 2002). Migration typically refers to "long-distance movement between regions" (Cameron 2013:219). Bellwood (2014:2) similarly defines migration as "the permanent movement of all or part of a population to inhabit a new territory, separate from that in which it was previously based." Definitions are often vague, but share in common that migration involves the movement of some segment of the population between geographic and/or cultural regions. Anthony (1990:895-896) adds the dimensions of social groups and intentionality, stating that "migration can be understood as a behavior that is typically performed by defined subgroups (often kin-recruited) with specific goals, targeted on known destinations and likely to use familiar routes." The social scales at which migration can occur range from individuals to households, to communities, and in some cases entire segments of a population. In this sense, migration is a varied but important
phenomenon that contributes to change in many contemporary societies, and certainly affected change in many cultural sequences in prehistory.

Migration and culture change in prehistory

The relationship between migration and cultural change is significant; the movement of people into a region often influences the behavior of both local and migrant populations (Bellwood 2004; Zvelebil 2001). Archaeologists have long considered the importance of migration (Trigger 2006). How this phenomenon was handled in American archaeology has gone through three general phases. These phases closely mirror the progression of the field's theoretical paradigms; they focus on description and traits (culture history), the importance of science, hypothesis testing, and behavioral processes (processualism), and considerations of the many social dimensions of migration (post-processualism). Each phase will be described briefly.

The culture-historical period in American archaeology was marked by overarching attempts to organize and classify often overwhelming amounts of data generated from years of early research and later from Depression-era archaeology programs and later regional surveys (Trigger 2006). Such organization took the form of archaeological 'cultures,' which reflected geographically bounded similarities in prehistoric artifacts and lifestyles, much akin to Wissler's (1927) culture areas. Diagnostic artifacts and general ways of life were used to delineate these cultures and create boundaries between groups with different styles or technologies. Frequently, these sequences are represented in culture historic charts in which one archaeological 'culture' suddenly and wholesale changes into another (e.g., Griffin 1967:Figure 1).

Diffusion (or acculturation) and migration were relied on as the key mechanisms by which cultural change occurred. Discussing change from one cultural unit to another, Rouse (1986:12) suggests "if the change from one to the other is gradual, and the traits of the new people are integrated into the structure of the old complex, we may conclude that acculturation has taken place. If the change is abrupt and the structure of the previous complex is replaced by a foreign structure, we may come down on the side of population movement." Although this dichotomous approach is overly simplistic (an issue addressed
later by Anthony [1990]), Rouse makes an important distinction regarding the pace of change and the types of artifacts and lifeways evident in a region. Gradual development and incorporation of non-local technologies or ideas is seen as a result of slow *in situ* development and minor diffusion. Sudden change, particularly when associated with foreign materials, can indicate the movement of non-local populations into a region.

In many ways, growing reliance on migration as a key way through which cultures changed, or even an explanatory default, prompted the anti-migration stance and general insularity of the processual response to culture historical approaches. In the mid-1980's, Irving Rouse, who had long considered migration a relevant mechanism for cultural change in certain areas of the world (e.g., Rouse 1958), noted that "there has been a worldwide 'retreat from migrationism.' Archaeologists everywhere have become disillusioned with the use of migration hypotheses to explain similarities in cultural remains" (Rouse 1986:17). Rouse's lament characterizes the shift to a processual, scientific paradigm in archaeology initiated by Taylor (1948) and championed by Binford (e.g., 1962). When Binford (1962) stressed the analysis of cultural systems over historical events like migration, archaeological sites became conceptualized as heuristic closed systems meant to mimic laboratories for testing the relationships between ecological and cultural variables. This left external influences like cultural interaction, diffusion, and migration as largely epiphenomenal to the study of cultural processes and laws. As a result, for almost 30 years many American archaeologists dismissed migration and this topic atrophied theoretically.

After a generation of the processual paradigm in archaeology, the indomitable attitude of many adherents began to shift toward less dogmatic considerations of cultural change. Anthony (1990) was one of the first to reconsider migration, fearing that we may have thrown the baby out with the bathwater. Put another way, in rejecting migration wholesale, those cases in which migration actually represents a viable explanation may have been overlooked. In his attempt to bring migration back into the spotlight, Anthony deconstructed culture historic approaches. His main critique is that culture historians (primarily Rouse) focused on attempting to find changes in trait-based regional
chronologies, while missing the main questions of what caused people to move and what form movement took.

After a critique of culture historic approaches to migration, Anthony (1990) focuses on the structure and different types of migration evident in the archaeological record. Instead of examining specific causes of migration, he suggests that identifying more generalized push and pull factors provides better insight into prehistoric migrations. Push factors are stressful conditions that create discord in a peoples' homeland, and can incite emigration in some or all segments of a society. Pull factors are beneficial conditions in potential new homelands that attract people. In each case, causes can range from social (such as demographic pressure or relatives in a distant land) to ecological (such as drought conditions leading to decreased crop yields or rumor of better conditions elsewhere), and frequently reflect multifaceted reasons for movement. The conditions that lead to migration often involve a combination of each: "migration is most likely to occur when there are negative (push) stresses in the home region and positive (pull) attractions in the destination region, and the transportation costs between the two are acceptable" (Antony 1990:899). For cases in which migration is suspected to have occurred, identifying potential push and pull factors can help explore the possibility that people moved and begin laying the groundwork for explorations of why such movement occurred.

The post-processual critique of processual archaeology focused on a number of social elements, one of which was interaction. Eschewing the site as isolated laboratory approach of the New Archaeology, post-processualists turned their sights outward, asking questions through the lenses of Marxism, Feminism, and considering the transformative power of cultural contact (e.g., Stein 2002). Cameron (2013) offers an overview of the directions migration studies have taken in archaeology since Anthony's (1990) reinvigoration. Cameron (2013:219) critiques the idea of push/pull models, suggesting that they assume both that societies were rational decision-makers and that both push and pull factors existed in all situations. Instead, she suggests that social factors, including marriage, warfare, and exchange, were the primary motivators of movement among prehistoric societies.
Archaeological Indicators of Migration

"Significant migrations that lead to permanent settlement into new territory will always leave a signature. Our problem is to recognize that signature" (Bellwood 2014:17).

In this statement Bellwood sums up the issues inherent to migration in prehistoric archaeology. Migrations leave signatures. Archaeologists, based on collective understanding of their regions, must be able to identify these signatures. Rouse (1958:64) provides a 5-step approach for doing so: "1) identify the migrating people as an intrusive unit in the region it has penetrated; 2) trace this unit back to its homeland; 3) determine that all occurrences of the unit are contemporaneous; 4) establish the existence of favorable conditions for migration; and 5) demonstrate that some other hypothesis, such as independent invention or diffusion of traits, does not better fit the facts of the situation." Although perhaps limited by culture historic language, Rouse's approach remains useful. This section provides a general framework for examining migration within a region that follows and augments Rouse's (1958) original methodology. This approach will be used in subsequent explorations of the spread of a Mississippian lifestyle into the Middle Ohio Valley.

Although authors tend to characterize one another as incorrect, or at least oversimplified (see Anthony's [1990] treatment of Rouse [1958, 1986], or Cameron's [2013] treatment of Anthony [1990]), it is useful to consider the merits of each approach. In many regions, an application of the strengths of culture historical, processual, and post-processual approaches to considerations of migration can provide useful insights. The methods originating from each of these theoretical paradigms provide a facet for a more holistic understanding of migration at different scales. This hierarchical approach spans the method/theory divide that is so often an issue in migration studies (e.g., Anthony 1990). The ultimate goal of this approach is to identify migration at the scale of archaeological sites and regions, understand the motivations behind migration and the form(s) it took, and attempt to parse out the social aspects and ramifications of specific migrations. Although accomplishing all three elements may be a task ultimately beyond the scope of any one project in many regions, with consideration of this approach, a solid
foundation can be laid regarding the exploration of migration in the prehistoric sequence of a particular region.

Anthony (1990:897) begins a list of 'the wrong questions' to ask in regard to migration with "how is migration to be identified archaeologically?" His main critique of this methodological question is that it is typically used as a starting point, without understanding how the process of migration works. In essence, this is a criticism of the classificatory approaches of Rouse (1958, 1986) and others, who used culture historic taxa and diagnostic artifacts to imply the movement of people. Anthony's critique reiterates those of processual archaeologists; we must understand cultural processes, not changes in artificial artifact/cultural groupings. Despite the simplicity of some of Rouse's migration scenarios (e.g., invasion of one cultural group by another), there is merit to the methodological concern of how to identify migrations in archaeological record. Anthony (1990) is also in danger of losing babies in the bathwater.

There are two scales at which identifying migration can be accomplished. Taken together they unify culture historical and processual approaches to migration. First, at the scale of a small region, one must be able to determine if a site or system of contemporary sites lies outside of the range of local cultural variation. This typically involves thorough examination of one or a few archaeological sites and the material culture therein to demonstrate a site-level 'intrusion' into a region (e.g., Rouse 1958). Second, at the scale of larger regions, one must be able to both identify likely source regions and to understand the processes through which migration occurred. This includes exploring those factors which catalyzed migration, such as possible push and pull factors (Anthony 1990), and provides insight into interregional connections and the motivations of prehistoric migrants. The archaeological correlates of each scale will be discussed in turn.

Identifying Correlates of Migration at the Regional Level

At the level of archaeological sites or a small system of sites, numerous lines of evidence can be used to infer the presence of migrants. In increasing levels of inferential power, material culture (artifact function and style), life-ways (i.e. diet, site grammar, households, etc.) and isotopic evidence (e.g., strontium) all provide evidence for the
movement of individuals or groups. In many cases only one or two of these lines of evidence are available, although in some cases the archaeological record provides overwhelming evidence. Such patterning is by necessity comparative both diachronically and synchronically. Diachronic analysis is required for understanding the cultural group in question and those people that immediately preceded them. Comparison in this way provides insight into whether change was gradual (i.e. stemming logically from preceding traditions) or abrupt (i.e. a notable disconnect between traditions). This method is also synchronic in that potential migrant communities or assemblages must be compared to other contemporary groups. This form of comparison provides insight into whether a site may be intrusive in a region, one of Rouse’s (1958) criteria for identifying migration archaeologically.

**Material Culture**

Material culture presents two possible avenues into examining migration in the archaeological record. First is the traditional method of identifying non-local or exotic artifacts, in the form of raw materials, technologies, and/or styles. In many regions, this approach underlies attempts to delineate and explain prestige goods and associated economies (e.g., Brown et al. 1990). However, this is a difficult line of evidence on its own. Non-local artifacts could alternatively point to down-the-line trade, the movement of individuals, or some combination of the two; items have varied and sometimes unexpected use-lives. At times, even goods thought to be imported through extensive trade networks can be compellingly argued to be the result of individual movement (e.g., DeBoer 2004). As a sole source of evidence, individual exotic goods must be interpreted using the context of the site from which they were recovered and placed in a broader local and regional framework.

The second way that material culture can be used to infer migration is on the level of site assemblages. This represents a more powerful line of evidence in that assemblages from an intrusive site frequently represent different suites of artifacts (reflecting different economic tasks and/or stylistic traditions) when compared to preceding or contemporary local sites. Along these lines, Rouse (1986:9) suggests that “if a household or village site
yields an alien complex, we may assume that its former inhabitants intruded from the homeland of that complex." Two important points are evident in this statement. First, migration processes at this level act and can be identified at the scale of households and/or villages. Second, when dramatically different assemblages are encountered at these scales, identifying a source region that matches these assemblages can help point to the movement of people, households, and communities. This is often more time consuming than the analysis of individual exotic goods, but differences at the assemblage level present meaningful evidence for the intrusion of non-local people.

Ways of Life

The general lifestyle of prehistoric small-scale societies encompasses subsistence and settlement patterns as well as mortuary behavior, each of which will be considered in terms of how they may be affected by both autochthonous change and change from external sources. It is critical to remember, however, that comparisons must be both diachronic and synchronic. In essence, this follows with Rouse’s (1986:11) consideration of suites of cultural characteristics in time and space: “insofar as a series or subseries is distributed through time, we can consider it a local development. If it is also distributed through space we can say that it expanded from one area to another. We are then faced with the problem of explaining the expansion.” Interests lie in considering both local sequences (e.g., the Woodland sequence in the Middle Ohio Valley) and the sudden appearance of non-local people.

Subsistence patterns include not only what people ate but also how dishes were prepared and served, how crops were planted, how fields were prepared, and how land tenure systems arose. These elements reflect an adaptation to environmental and social conditions in a region and represent the economic foundation of a society. Subsistence systems are generally conservative, considering novel forms of subsistence behavior can meet resistance and/or result in cultural disintegration (Rosenberg 1994:328). For this reason most subsistence change tends to reflect long-term human plant/animal interaction and domestication (e.g., Rindos 1984). Sudden changes in subsistence patterns can reflect diffusion of crops or the movement of people into a region with a different suite of crops.
and set of behaviors (Bellwood 2004). Change is most likely in situations of cultural contact or environmental change (e.g., Zvelebil 2001).

Loosely considered, settlement patterns incorporate everything from household architecture, to settlement layout, to site location preferences. Of particular interest in small-scale agrarian societies are household architecture and overall site grammar. Conceptualizations of households as social and economic units shift with the transition to agriculture (e.g., Watkins 2004), often reflecting changes in structures themselves. For example, in the Eastern Woodlands, wall-trench construction is distinct and related to the spread of a Mississippian maize-based lifestyle (e.g., Alt and Pauketat 2011; Pauketat 2007). In this sense, understanding changes in household architecture over time or the sudden appearance of novel architectural forms can help shed light on cultural contact and the movement of people. Site grammar reflects a shared understanding of site layout that is grounded in ideological systems (Lewis et al. 1998). In essence, how a community is designed often has ties to aspects of social elements like cosmology or kinship. Changes in site grammar are likely to reflect the implementation of novel rules in a society, potentially as a result of religious movements or the influx of new people and ideas about how communities should be formed.

Mortuary patterning is an important element of many societies and is often enmeshed within ideological systems. How people treat their dead is highly variable and culturally significant (e.g., Pearson 1999). Changes in mortuary patterns can reflect numerous changes in society. For example, among mobile societies, cemeteries are often used as territorial landmarks or communal gathering places (e.g., di Lernia et al. 2013), while agricultural societies often incorporate their dead into sedentary settlements (e.g., Cook 2008; Hodder and Pels 2010). Changes in the handling of actual physical remains are also telling. Whether burials were secondary, cremated, primary and flexed, or primary and extended are all important considerations. Transitions between these types of inhumations are also important to consider, as they may reflect differences in treatment of the dead.

These three cultural elements, how people subsisted, how they lived, and how they treated their dead form a general cultural system that can be characterized in the
archaeological record of many small-scale societies. Understanding changes in the elements of a cultural system, particularly the tempo and mode of change, can help highlight the processes behind such change.

**People**

Perhaps the most telling indicator of migration comes from the remains of humans themselves. Considerable effort has been spent honing bioarchaeological and geochemical approaches in order to inform on issues of migration. An approach which has been growing in popularity is strontium isotope analysis, which examines strontium ($^{87}$Sr/$^{86}$Sr) levels in bone and can be used to determine likely places of origin for both people and animals (e.g., Price et al 2002). In essence, because people uptake strontium through local drinking water, analysis of strontium levels in tooth enamel can provide levels of where a person grew up. This provides a powerful tool for identifying non-local individuals within a population and narrowing down the possible regions from which they came. One issue with this approach is that for a person to be a strontium outlier, they must be first generation migrants. Because this approach is influenced by local bedrock, the first generation of descendants would look local by strontium alone.

An example of successful applications of strontium analysis to the problem of migration can be seen in Price's (Price et al. 2007; Cook and Price 2015) explorations of population movement in the Mississippian world. The first example of this approach focuses on Aztalan, a site often cited as a Mississippian outpost in Wisconsin. Price et al. (2007) were able to determine that numerous individuals from this site have non-local signatures, some of which match the region around Cahokia. Along with archaeological lines of evidence, this paper supported the idea that Aztalan was founded and/or inhabited by non-local Mississippians. The second application of strontium analysis was to Fort Ancient sites in the Miami Valleys (Cook and Price 2015). Looking at skeletal remains from seven sites, the authors determined that non-local migrants constituted a significant proportion of the sample, especially at early Fort Ancient sites like Guard, Turpin, and State Line. Particularly relevant to the present study is that approximately 30% of the burials from the Fort Ancient burial mound at Turpin were shown to have been non-local
in origin. These migrants may have come from such places as Illinois, Indiana, and Tennessee. By sampling skeletal remains from these sites, Cook and Price (2015) were able to provide compelling evidence for the movement of numerous people during this formative time period.

**Migration in Regions**

The three lines of evidence outlined above provide a framework for identifying migration in archaeological contexts at the site or regional level. The strongest case for migration in a region can be made using all three lines of evidence. Consideration of a hypothetical strong case for migration in a region allows for the development of generalized expectations if the hypothesis that migration occurred is supported. First, artifact assemblages recovered from a site or sites are notably unlike assemblages from earlier and contemporary local sites. Second, subsistence, settlement, and mortuary patterns do not follow in line with gradual development. Often, this may be expressed in terms of new crops, novel household architecture, or new forms of site grammar. Finally, non-local individuals will be identified at sites, although this will likely not be a majority since second generation migrants will appear local if using strontium.

In a region in which all three of these lines of evidence are available, it would be difficult to deny that migration occurred. Less compelling cases can be made with two or even one of these lines of evidence, although it is important to have multiple lines of evidence to support an argument of migration in a region. In Chapter 9 I will return to these expectations in regard to the transition from Late Woodland to Fort Ancient societies in the Middle Ohio Valley.

**Identifying Migration Processes at the Macro-regional Level**

Numerous models exist for explaining the various forms of migration evident in prehistoric and historic sequences worldwide (e.g., Anthony 1990; Sanjek 2003; Zvelebil 2000, 2001). Many historic models emphasize economic aspects of migration (e.g., Sanjek 2003). Prehistoric models tend to emphasize evident archaeological patterns and use these to explore the complex processes which underlie migration. Three such models
are relevant to the discussion migration in small-scales societies. It is important to note that these models are not mutually exclusive; certain situations may reflect elements of each.

**Demic Diffusion Model**

The classic conception of the slow but steady movement of Neolithic farmers from the Levant, through Anatolia, and into Europe reflects the demic diffusion, or 'wave of advance' model (e.g., Ammerman and Cavalli-Sforza 1971). Underlying this model is the logic that early farming communities experienced greater population growth than contemporary non-agricultural groups, resulting in fissioning and displacement. This phenomenon has been termed the Neolithic Demographic Transition, and has been documented throughout the world (Bocquet-Appel and Bar-Yosef 2008). Zvelebil (2000:2) suggests that this model involves the "sequential colonisation of a region by small groups or households. It occurs over many generations and involves slowly expanding farming populations, colonising new areas by the 'budding off' of daughter hamlets from the old agricultural settlements in a non-directional pattern." Two elements are important to this sequence. First, population growth in early Neolithic settlements forced communities to fission into daughter communities, a process that Bandy (2004) links to scalar stress (sensu Johnson 1982) and conflict among community members. Second, Zvelebil suggests that demic diffusion is largely directionless; expansion occurs in a way that fills a landscape, instead of moving along direct paths.

Archaeological expectations of this model are threefold. First, a homeland must be identifiable from which populations and innovations emanated. This sets a foundation for understanding movement, as well as material culture, subsistence and settlement patterns. Second, spatial and temporal considerations must be determined regarding how long it took people to spread and what constraints existed on their expansion. Finally, a distance decay relationship is likely to exist from the homeland to the extent of migrants. Özdoğan (2008) identified this pattern in the Old World, in which elements of the Neolithic package developed in Anatolia either fell out of cultural packages or were replaced with local emulations over space and time. In a region in which demic diffusion occurred, we
should expect to see an initial appearance of non-local agricultural groups with a distinct homeland, likely tethered to large rivers (Davison et al. 2006). Over time, early villages should expand in size until a threshold is reached, be it demographic or social. At this point, daughter communities fission off and spread throughout uplands and/or along river valleys, seeking ecological conditions necessary to perpetuate their farming lifestyle.

Migration Stream Model

At the opposite end of the spectrum from demic diffusion, the migration stream model characterizes directional movement from a home region to a particular destination. Of particular importance is the preexisting connection necessary in order for migrants to successfully relocate. In regard to the effects of this model on archaeological materials, Anthony (1990:903) suggests that "stream migration will carry regionally defined artifact types from a circumscribed home region to a specified destination. Innovation in the new home might then lead to a sort of artifactual ‘founder’s effect,’ resulting in rapid stylistic change from what was in any case a narrowly defined pool of variability." In essence, new styles will appear in a region from the migrants' homeland, although these styles will only reflect a subset of those used by everyone in that homeland. The founder's effect postulated by Anthony would then result in the formation of new styles, linked to but different from the original styles.

Leap-frog Model

An intermediate between demic diffusion and migration stream models is the leapfrog model. Zvelebil (2000:2) defines this pattern as "selective colonisation of an area by small groups, who target optimal areas for exploitation, thus forming an enclave settlement among native inhabitations." The process through which leapfrog migration occurs is complex, but often involves multiple stages of movement. Anthony (1990:902) suggests that in contemporary agrarian societies, expansion occurs in a three-step process. First, scouts, or exploratory groups designate optimal destinations, which should reflect the basic ecological conditions of a homeland for continuation of subsistence practices. These scouting endeavors may be visible archaeologically through non-local
artifacts or isolated non-local settlements. Second, families are sent to settle in hamlets or small villages in predetermined optimal areas. The members of these settlements would have had an anchor from the initial settlements or connections established by scouting groups. Third, communities grew to a threshold of scalar stress and fissioned, creating daughter communities throughout a small region.

Archaeologically, this process would form a pattern characterized at first by isolated enclaves of intrusive communities, surrounded by indigenous populations or largely empty regions. Over time, expansion communities would develop, forming larger cultural regions that ultimately tie to a distant homeland. There are many examples of leapfrog migration among Neolithic societies. For example, using genetic and archaeological evidence, Richards (2003) suggests that the LBK expansion through Europe is best characterized by a leapfrog process. Similarly, Zeder (2008) identifies maritime migrants in the Mediterranean whose expansion followed a leapfrog model along coastlines, ultimately creating enclaves of migrants living among local populations. In the Mississippian world, a case could be made for Aztalan (e.g., Price et al. 2009), among others, as an enclave among local Late Woodland groups.

**Migration in Macro-regions**

Reducing the resolution for understanding migration and focusing on regional or super-regional scales allows for the characterization of patterns of movement. Analysis at this level allows for a broader picture that incorporates source regions of migrants as well as the processes through which migration occurred. Identifying archaeological correlates of these processes requires an understanding of regional patterns. If migration occurred in a given region, characterizing how that migration occurred allows for an understanding of the processes underlying regional archaeological sequences and can be used as a model for exploring the relationship between contemporary or sequential sites. Taken in conjunction with the site-level correlates explored above, this framework provides a multiscalar approach to understanding the archaeological signature of migration and starting to uncover the processes which underlie it.
Summary: Macroevolution, Multi-scalar Analysis, and Migration

This chapter has identified theoretical issues and limitations in archaeological thought in the Middle Ohio Valley and provided a method for understanding change in a more encompassing way. As a unified theoretical alternative, I suggest that macroevolutionary theory represents a robust framework for examining cultural change in past societies. This paradigm focuses on three primary elements for understanding cultural systems and cultural change. First, human agency is a key driver of adaptation, resistance, and change. Although change occurs at multiple levels, the actions of individuals and groups are the loci of innovation and adaptation. Second, cultures are arranged, influenced, and change based on hierarchical scales. As such, a macroevolutionary approach must utilize a multiscalar analysis in order to understand change. Finally, the general state of cultural systems is relative stasis; change occurs in punctuated events, catalyzed by stress or opportunity.

Building on the concept of multiscalar analysis, I outlined four scales of analysis used in this study. First, a broad understanding of environmental conditions and thresholds provides a necessary backdrop against which cultural change is interpreted. Second, dynamics at the site-level provide a critical foundation for understanding patterning at higher scales. Evidence at this scale includes architecture, material culture, and chronological data and allows for scales to be linked. Third, the scale of small regions provides an understanding of a contemporary system of culturally similar settlements. Finally, the broad region, referred to alternatively as culture areas or ethnoscapes, provides a backdrop of the spread of people as well as economic, technological, and ideological trends not explicitly evident at the level of individual sites, but which provide a context within which everyday actions occur. Using these four levels of analysis, the development of Fort Ancient village life in the context of broad environmental and social trends will be explored.

At the end of this chapter, I focused on the characteristics of migration in small-scale prehistoric societies. The relationship between migration and macroevolution is important to consider. Macroevolution represents a framework for understanding cultural change in the past, while migration reflects a historic process or event. The relationship
between these concepts is that of model and a potential mechanism for change. As suggested, macroevolution relies on the concepts of interrelated hierarchical processes and punctuated equilibrium. Migration events represent one of the many ways in which punctuations of cultural change can occur. These events are influenced by processes acting on multiple levels, and enacted at the scale of individuals and communities, fitting well within the framework of macroevolution. The net effect of the movement of social groups over long distances is the transference of part or all of the migrant group's cultural bauplan (Prentiss et al. 2009:10). These baupläne can then undergo adaptation to local environmental and social conditions. Migration acts as a catalyst for cultural change in a region, and has the potential to reflect the type of punctuation event critical to macroevolutionary change.

On one level, the goal of this project is to provide a case study for the application of macroevolutionary theory to the American Midwest, which involves testing hypotheses of autochthonous change, cultural contact, and migration to help refine our understanding of prehistoric sequences. The following research questions are framed through the scales of analysis described above and unlike many projects in this region, includes the potential of migration as a driver of change. These questions seek to examine the events that resulted in the establishment of village life at Turpin, and throughout the Middle Ohio Valley.
Chapter 3: Research Questions

As I have outlined, cultural change occurs as a result of many factors working at multiple levels (e.g., Kowalewski 1995; Zeder 2009). As such, the research questions that guide this project are based on increasing scales of analysis. At each level, questions contextualize data from the Turpin site and nest findings within broader patterns. It is only with a foundation of confidently excavated and analyzed data that we can begin to work at multiple scales and mitigate the pitfalls of the ecological fallacy. Data from a single transitional site, focused on examining each occupation as well as processes of change, represents the best way to begin building such a foundation. The scales of analysis utilized in this study reflect a combination of emic (household and community) and etic (regional and environmental) categories. By necessity, once comparisons transcend regional levels, questions become more abstract in nature; examining trends at the level of the Eastern Woodlands, for example, requires understanding of numerous complex cultural groups.

To understand changes at Turpin, four scales of analysis are used, as discussed in the previous chapter. The household/community level allows for understanding of the nature of and changes in everyday practices in the fundamental economic and social venues in a society (e.g., Lightfoot et al. 1998; Pluckhahn 2010). The scale of a region of communities traces patterns and linkages between contemporary, culturally similar communities in a circumscribed region. These communities are assumed to be more similar to each other culturally than surrounding groups and likely have economic, social, and historical ties. Examination of supra-regional trends seeks to contextualize local and regional trends within broader social, economic, and ideological patterns. These include Late Woodland social trends (e.g., Nassaney and Cobb 1991) and the formation of Mississippian polities in the central Mississippi Valley and Lower Ohio River Valley.
Environmental trends take into account changes in climate, contingent environmental thresholds, and potential human responses, which are critical to understanding macroevolutionary change (Zeder 2009). This combination of scales helps illuminate not only site-level trends, but how the emergence of Fort Ancient culture fits within a broader historical and ecological context.

**Household/Community Scale**

Households and village communities represent two of the most meaningful scales of anthropological analysis, as these levels represent the venues in which every-day practices unfold (Birch 2012; Canuto and Yaeger 2000; Douglass and Gonlin 2012). Cultural changes, even when influenced primarily by outside factors, are enacted at these levels by the decisions of individuals and social groups. As such, it is necessary to focus on this level to examine fundamental patterns and changes since it is at these levels that changes in practice are evident (Lightfoot 1995; Lightfoot et al. 1998).

**Question 1: What is the nature of early Fort Ancient occupation at Turpin? How does it relate to the preceding Late Woodland component?**

As I discuss in Chapter 6, previous work suggests that Turpin exhibits both Late Woodland and Fort Ancient habitation and mortuary contexts (Griffin 1956; Drooker 1997; Oehler 1976; Seeman and Dancey 2000; Starr 1960). Original excavations suggested that Late Woodland activities were limited to a stone burial mound and a structure beneath a Fort Ancient burial mound (Oehler 1973). Similarly, the Fort Ancient activity appears to exist throughout much of the landform (Metz 1885), but most confidently in the Fort Ancient burial mound (Oehler 1973). In order to understand long-term development at Turpin, it is necessary to determine the characteristics of these occupations and where they were located in the landform. Geophysical research at the site has revealed two circular patterns of house-sized anomalies which may indicate prehistoric communities (Burks and Cook 2011). These locations represent the primary focus of this project. Locus 1 is in the western portion of the landform and is marked by
distinct square magnetic anomalies. Locus 2 is in the eastern portion of the landform and contains circular anomalies.

Understanding the timing and structure of prehistoric occupation at Turpin will elucidate relationships between Late Woodland and Fort Ancient cultures and provide detailed information regarding chronology, material culture, and household and community patterning. Three potential alternatives may account for Late Woodland and Fort Ancient findings at Turpin, reflecting different levels of contact with contemporary Mississippian polities in the central Mississippi Valley and lower Ohio Valley. Each scenario will be outlined along with expectations for different archaeological lines of evidence, including dating, material culture, and architectural evidence. Following these expectations, implications for that alternative will be presented. These scenarios will be returned to in order to assess findings regarding the relationship between Late Woodland and Fort Ancient occupation of Turpin.

_scenario 1: Gradual in situ evolution of Late Woodland into Fort Ancient_

The first scenario posits that Fort Ancient culture reflects autochthonous development stemming from preceding Late Woodland traditions. This hypothesis follows commonly held models for the development of farming communities in the region (e.g., Church 1987; Church and Nass 2002; Pollack and Henderson 2000; Pollack et al. 2002) and acts as a type of null hypothesis for this project.

If this scenario is true, archaeological lines of evidence should reflect continuous change. First, dates from Late Woodland and Fort Ancient occupations should overlap, with no evident hiatus. Considering how well-dated Turpin is in terms of number of dates (n=18) and areas of the site that have been dated, all dates should provide a representative sample of occupations of the landform. Second, material culture should reflect a gradual evolution in forms and technology. Ceramic evidence should demonstrate the gradual introduction of shell as a tempering agent and over time decoration and diversity of vessel forms should increase (Riggs 1998; Turnbow and Henderson 1992). Evidence from stone tools should reflect a similarly slow pace of change. For example, the transition to bow and arrow technology, often posited to have occurred during this time
period (e.g., Seeman and Dancey 2000), should be evident. This includes Levanna points, an early style of arrow points in this region (Justice 1987). Third, as aggregation and sedentism increased during the transition to maize agriculture, household architecture and site structure should have undergone gradual transitions. In the American Bottom, the Range site (Kelly 2007 [1990]) exhibits change over 550 years not only in how houses were constructed, but also in how settlements were organized. People also utilized similar areas of the site over time. If similar gradual processes unfolded at Turpin, a generally comparable sequence of change should be evident. Finally, considering the focus on prehistoric mortuary activity at Turpin, which ultimately resulted in well over 300 burials (Drooker 1997), change in mortuary patterns should reflect a gradual pace of change if change occurred at all. This would likely be reflected in overlap in the areas utilized for interment, similarity in how the dead were treated, and a general consistency in mortuary practices over time.

In terms of the two loci identified as part of this project, cultural difference may be evident. Namely, one could be a Fort Ancient community while the other could be a Late Woodland community. This is potentially supported by the shape of magnetic anomalies. Locus 1 is composed of seemingly rectangular anomalies. Locus 2 is composed of what appear to be roughly circular anomalies. Given that presumably Late Woodland houses at sites like Lichliter appear to be circular (Baby 1971), it could be that the anomalies in Locus 2 reflect similar circular structures. If this were the case, excavations should produce patently Fort Ancient material (artifacts, structures, and dates) in Locus 1, while Locus 2 should produce diagnostic Late Woodland structures and material culture, accompanied by Late Woodland dates from secure contexts.

If available data support this scenario, there are two primary implications. First, Turpin reflects in situ development of early Fort Ancient communities from Late Woodland groups. In this case, long-term aggregation and the slow introduction of maize and gradual reliance on it as a staple crop result in the development of villages relying on maize agriculture. This reflects Bandy’s (2008) Type 1 sequence of village development. Second, external influence, as reflected in Mississippian goods and styles, was gradually introduced later in the Fort Ancient period and likely resulted from down-the-line trade
(e.g., Pollack et al. 2002). This scenario reflects one end of the spectrum of possible relationships between Late Woodland and Fort Ancient peoples at Turpin and fits well with conventional thinking in the Middle Ohio Valley.

**Scenario 2: No connection between Late Woodland and Fort Ancient occupations**

This scenario posits that despite having occupied the same landform at Turpin, Late Woodland and Fort Ancient groups were unrelated and unconnected. The underlying idea behind this hypothesis is one common to culture historic approaches. Namely, population replacement of some sort occurred. This concept does not need to be as dramatic as the invasion or conquest posited by some early culture historians (e.g., Prufer and Shane 1970; Rouse 1986; Starr 1960). This process can simply reflect the movement of non-local people into lightly or largely unoccupied regions.

If the Fort Ancient occupation of Turpin was independent of Late Woodland activities, archaeological indicators should reflect the abrupt replacement of one set of traditions with another. First, dates should reflect multiple statistically independent occupations, one from approximately AD 500-1000 and the second from AD 1000-1300. Second, material culture should exhibit a distinct break between Late Woodland and Fort Ancient assemblages. Ceramic assemblages would likely exhibit differences in tempering material (i.e. rock vs. shell), the sizes and forms of vessels, and a difference in the types of vessels (i.e. jars or bowls) represented. Lithic assemblages would reflect different general organizations of technology, including raw material choices, tool production, and curation expectations. Third, household architecture and site structure would likely be very different, considering people would have drawn on different traditions and conceptualizations of what constitutes a house and how they should be built. In this sense, new forms of household architecture would appear quickly in the archaeological record. Also, utilization of space at the site would probably have had different focuses in each time period. Finally, mortuary traditions would likely be quite different as they reflect the traditions of different groups of people. This may manifest itself in different usage of space, different types of burials (primary vs. secondary), different burial positions (flexed vs. extended) or different grave goods.
In regard to the two loci examined in the present study of Turpin, if this scenario were true, both communities could belong to a single cultural group. So, both could be Fort Ancient or both could be Late Woodland in origin. Given the frequency of shell tempered ceramics recovered from this site and Metz's (1885) discovery of wall trench structures (as discussed in Chapter 6), it is likely that if both communities are roughly contemporary, they would be Fort Ancient. If this were the case, both communities should produce wall trench (or comparatively sized set-post) structures that date within the Fort Ancient sequence. Additionally, material culture should reflect Fort Ancient types, including decorated, shell tempered pottery and triangular projectile points.

If these communities both reflect either solely Late Woodland or Fort Ancient occupations, their contemporaneity will be difficult to untangle. As such, these potential structures require a detailed dating regime, including Bayesian analysis of AMS dates of particular events. Contemporary but adjacent communities could point to different populations aggregating at the same location but remaining spatially discrete. Sequential occupations of different areas of the same landform could point to processes of house/village abandonment but a desire to remain in the same location. Samples will be taken from multiple contexts which will provide a logical sequence of events for Bayesian modeling (e.g., Krus et al. 2015). This will help refine understanding of the timing of these communities and in doing so, help refine understanding of prehistoric dynamics at Turpin.

The implications of this scenario are that Turpin represents a site-level ‘intrusion’ by non-local Mississippians. If true, this would suggest that Mississippian farmers migrated up the Ohio River, settling at Turpin (among other places). Broadly, this is consistent with the movement of prehistoric farmers on a global scale, many of whom followed rivers to find fertile locations for new villages (e.g., Davison et al. 2006). These findings would meet the first two criteria of Rouse's (1958) migration scheme: identifying an intrusive unit and tracing it back to a general source.
Scenario 3: Culture contact between Late Woodland and small number of Mississippians

The final potential scenario represents a middle ground between autochthonous and migration scenarios. This hypothesis reflects the idea that a small number of Mississippian migrants entered the region c. AD 1000-1200 and interacted with established Late Woodland populations, catalyzing change among them. If true, this interaction resulted in a reorganization of local populations and aggregation in a small number of villages.

In terms of archaeological evidence supporting this scenario, findings will be less clear-cut and tend to reflect hybrid situations (e.g., Alt 2006). In situations like this, dating the emergence of new ways of life will be difficult because of the error ranges typically associated with calibrated AMS dating. Additionally, the contemporaneity of Late Woodland people practicing traditional lifestyles and those who were aggregating into villages provides a transitional time period in which dating would not help clarify this transition. Material culture should exhibit signs of hybridity when comparing with preceding groups. Ceramic assemblages should exhibit hybrid forms, designs, and/or technologies. Alternatively, assemblages could reflect mixture of local and non-local ceramics. Stone tool assemblages similarly should reflect a mixture of diagnostic tool types. In the Middle Ohio Valley, for example, hybrid contexts may produce Jack's Reef and Raccoon Corner Notched Late Woodland arrow points along with Late Prehistoric triangle points (see Justice 1987 for definitions of these types). In terms of household architecture, hybridized construction could be evident. In the Richland context in the uplands outside of Cahokia in the Mississippi Valley, Alt (2006) found structures exhibiting both post (local) and wall-trench (Mississippian) architecture; this structure was interpreted as a hybrid house, potentially built by local people in contact with Mississippian groups. Additionally, communities exhibiting cultural contact of this nature could be composed of both wall-trench and post-constructed houses.

If this scenario is true, it implies that that an influx of Mississippian migrants settled near or with local populations, resulting in aggregation of local groups and a hybrid cultural situation between Mississippians and local Late Woodland people. Such contact situations are common throughout the Midwest. For example, contact between
Late Woodland and intrusive Mississippian peoples in the Lower Illinois River Valley resulted in what Delaney-Rivera (2004) termed a colony-acculturation situation. This situation resulted from the movement of Mississippian farmers into the region, and resulted in a hybridized Late Woodland tradition which included Mississippian characteristics. If a similar situation unfolded in the Middle Ohio River Valley, we should expect comparable cultural hybridity and resulting ethnogenesis to be evident in the archaeological record.

**Region of Communities Scale**

**Question 2: What is the tempo and mode of early Fort Ancient village development and how does Turpin fit into this picture?**

How villages emerged in the Middle Ohio Valley is largely unknown. Typical assumptions regard villages as the result of long-term, gradual aggregation (e.g., Church 1987; Church and Nass 2002). At this point, large early Fort Ancient villages appear to be constrained to the lower reaches of the Great and Little Miami Rivers (Comstock and Cook 2016; Cook et al. 2014; Vickery et al. 2000), suggesting that proximity to the main trunk of the Ohio River was an important factor for these early communities. A few small settlements have been identified in Kentucky (e.g., Muir [Turnbow and Sharp 1988]; Dry Run [Sharp 1984]; Thompson [Henderson and Pollack 1992]), although these sites require further investigation and may represent a different pattern than that identified in the Miami Valleys. The earliest known communities in the Middle Ohio Valley along the main trunk of the Ohio River are Guard and State Line, both in the lower Great Miami Valley, and Turpin, in the lower Little Miami Valley. Comparison of newly excavated findings from Turpin with those of other early Fort Ancient villages will help situate Turpin within a regional perspective and provide an initial foundation for understanding how early villages developed in this area. Such comparisons also help to highlight differences between these early communities, differences which may help flesh out understanding of this formative period.

Questions at this level are largely inductive since the early Fort Ancient period is just beginning to be characterized in the Middle Ohio Valley, in part as a result of this
study. Characterization of this period through a synthesis of findings from Turpin, Guard, and State Line will help address subsequent questions regarding the emergence of village life in the lower Miami Valleys. A second comparison will add Muir, Thompson, and Dry Run, resulting in six early Fort Ancient sites that characterize the range of early Fort Ancient occupation in this region. Comparisons will be made on two levels. First, each site will be characterized in terms of chronology, community structure, and household architecture. Second, characteristics of ceramic production and design will be analyzed and compared between sites. Although initial and exploratory, these lines of evidence will help highlight basic similarities and differences between early Fort Ancient sites, and help to formulate a broader understanding of village development in this region.

**Supra-regional Scale**

**Question 3: What influence did Mississippian societies have on the emergence of village life in the Middle Ohio Valley?**

Throughout many attempts by archaeologists to understand how cultures change, the themes of migration, cultural contact, and autochthonous change have played central roles. When examining cultural transitions that span regions, it is thus important to consider each of these themes as possibilities, along with their archaeological correlates and broader implications. The following scenarios closely mirror those from Question 1 at the site scale but take into account regional and supra-regional trends in order to consider the broader influence of Mississippian ideas and/or people on the emergence of what archaeologists refer to as Fort Ancient culture. This question ties into concepts of the spread of a Mississippian lifestyle, the process of Mississippianization, and the emergence of a Mississippian ethnoscape.

*Scenario 1: No Mississippian influence, gradual in situ cultural evolution*

Throughout the Middle Ohio Valley and many areas in the greater Midwest and Southeast, processual archaeologists have considered change through the lens of gradual sociocultural evolution (Milner 1998; Muller and Stephens 1990; see Pauketat 2007 for an extended discussion). In many ways this mindset has become so engrained that it
forms a sort of null hypothesis for many scholars. As such, it acts as one here as well. The first scenario posits that at a scale spanning regions, most Fort Ancient groups were fairly insular and with the exception of some trade goods, had little contact with early and middle Mississippian groups until the late Fort Ancient period (after AD 1400).

Work by Pollack and Henderson (2000) and Pollack et al. (2002) exemplifies this approach. They suggest that the Fort Ancient sequence is characterized by gradual aggregation and increases in settlement size. Additionally, Fort Ancient culture is seen as an isolated development: "for all intents and purposes, the Fort Ancient culture area during these periods can be viewed as a closed system made up of several small regional subsystems each relatively unaffected by events that occurred outside the Fort Ancient culture area" (Pollack and Henderson 2000:215). In this sense, the authors posit that external connections played no role until late during the Fort Ancient sequence (c. AD 1400), and even these are seen to reflect down-the-line trade. Fort Ancient culture is thus considered a result of gradual evolution out of preceding Late Woodland groups.

If autochthonous development of agricultural societies occurred in the Middle Ohio Valley, certain expectations must be met in the archaeological record. First, early sites like Guard, Turpin, State Line, Muir, Thompson, and Dry Run should resemble preceding Late Woodland sites which they are assumed to be an extension of, albeit with increased aggregation and the appearance of some non-local crops like maize and potentially beans (Pollack and Henderson 1992). Second, taken at the assemblage-level, material culture should exhibit overlap between Late Woodland characteristics and typical Fort Ancient characteristics. For example, change in ceramic style and technology should reflect the progression posited by Turnbow and Henderson (1992). Third, little to no Mississippian influence should be evident at these early sites.

The implications of this scenario are that the development of maize agriculture and village life in the region occurred gradually and largely in isolation. External influences (such as maize) are thus a result of diffusion and limited down-the-line contact. In terms of Zvelebil’s (2000) consideration of interaction between farmers and foragers, this scenario would reflect contact, or general communication and trade through
existing connections, but little to no movement of people. This is the least potent type of interaction, and reinforces the idea that Fort Ancient cultures developed autochthonously.

Scenario 2: Some Mississippian influence - Late Woodland and Mississippian hybridization (few migrants, but mostly local people)

The second potential scenario is a middle-ground position which posits that local Late Woodland/Fort Ancient groups in the Middle Ohio Valley had contact with Mississippian people to a small extent, but this contact influenced Fort Ancient development. This interaction falls under the heading of a periphery-peer relationship, in which development between neighboring groups is linked (Cook 2008; Renfrew and Cherry 1986). In the case of Fort Ancient, co-development with Mississippian groups depends on the timing of interaction; many authors suggests that such interaction occurred late during the Fort Ancient sequence (post AD 1400) (Drooker 1997; Pollack and Henderson 2000). The essence of this scenario is that Fort Ancient reflects a hybrid lifestyle incorporating Late Woodland and Mississippian characteristics, a situation common on the Mississippian periphery (e.g., Delaney-Rivera 2004).

If this scenario is true, most early sites should exhibit primarily Woodland characteristics (i.e. small aggregate villages or hamlets), with a small number of Mississippian additions. The makeup of populations in this situation should be primarily Late Woodland people, with few if any Mississippian migrants. This may not be identical across a region; interaction and the movement of people may have played out differently in different communities in a region. However, some non-local traits should be evident and traceable to Mississippian traditions. In other areas, this includes the mixture of post and wall-trench construction houses in communities and hybridity in ceramic assemblages, reflecting cultural syncretism (e.g., Alt 2006; Delaney-Rivera 2004).

The implications of this scenario are that local Fort Ancient development was influenced by interactions with Mississippian neighbors. This mirrors the findings of Cook (2008) for SunWatch, a middle Fort Ancient site near Dayton, Ohio. SunWatch is interpreted as a Fort Ancient community into which a small number of Mississippian individuals formed an enclave wall trench house in the northern portion of the
community. The wall trench structure was associated with shell tempered ceramics; the majority of other ceramics were tempered with crushed rock. The question that this scenario begs is who are these migrants? Zvelebil (2000) posits a number of potential alternatives for small migrant populations that range from farmers to elites. He suggests that if the influx of populations were farmers, they would have moved gradually and in groups. Another alternative is the movement of elites, who would have been set up in a position of authority and may have dominated (or at least influenced) local populations. Finally, the role of specialists must be considered. These individuals are thought to have infiltrated regions for economic or social purposes (Zvelebil 2000), an idea that fits well with the idea of proselytizing Mississippians (e.g., Pauketat 2004). Characterizing which of these types of contact, if any, reflects the relationship between Fort Ancient and Mississippian communities depends on the nature of data at individual sites as well as on a broader regional scale.

Scenario 3: Primarily Mississippian influence, migration/replacement (many migrants, some, if any, local people)

The final scenario posits that migration is a key mechanism for cultural change between the culture historic Late Woodland and Fort Ancient taxonomic units. Considerations of migration, en vogue in the early period of archaeology, have been discounted since about 1960 in this region (Trigger 2006). However, this theoretical hiatus does not preclude consideration of migration as one potential hypothesis. The essence of this scenario is that at approximately AD 1100 the movement of Mississippian people into the Middle Ohio Valley catalyzed cultural change, resulting in the emergence of what archaeologists call Fort Ancient culture. One important question is whether population densities in this region were sufficiently high that significant hybridization occurred or whether densities were low enough that incoming Mississippians settled in largely empty valleys.

As outlined previously, if migration occurred in this region, certain archaeological correlates should be identifiable at the site-level. Counter to conventional sequences, early sites should be large and have distinctly Mississippian traits. Also, considering
common Neolithic patterns of dispersal, early sites are likely to have appeared first along the main trunk of major river valleys or their immediate tributaries (e.g., Davison et al. 2006). Consideration of site-level intrusion of this nature requires an understanding of local populations. If early sites were large and predominately Mississippian (i.e. without distinct Woodland characteristics), population densities may have been low enough that these valleys may have been effectively (if not absolutely) vacant.

If these early villages represent migrant communities, this has implications for the nature of cultural contact in this region. In regard to Zvelebil's (2000) models for contact between foragers and farmers, this contact could take the form of elite dominance, infiltration by specialists (likely religious), demic diffusion, leapfrog colonization, or some unique combination of these processes. Numerous lines of evidence can be investigated at site, regional, and super-regional scales in order to help refine understanding of how events unfolded.

Environment

Question 4: How did changes in regional climate systems influence human behavior and cultural change in the Middle Ohio River Valley during the late Holocene (c. AD 500-1500)?

The environment sets general parameters within which humans act. Changes in these parameters, particularly abrupt and intense changes, likely forced people to alter their behaviors (e.g., Fagan 2001, 2008). Perhaps one of the most useful ways to examine the relationships between environment and culture is that of climate thresholds. Thresholds in the climate system are not often explicitly considered by archaeologists, although these thresholds play a large role in attempts to understand the causes and influences of modern climate change (Solomon et al. 2007). Typically, climate thresholds represent times when systemic change occurs to a point where the climate system cannot easily return to its previous state (Alley et al. 2003). Generally, these thresholds are identified by looking for deviations from the normal pace of change in long-term climate data.
Abrupt climate changes are those that take "...place so rapidly and unexpectedly that human or natural systems have difficulty adapting to it...[they are] likely to be significant, from a human perspective, if they persist over years or longer, are larger than typical climate variability, and affect sub-continental or larger regions" (Alley et al. 2003:14). Such abrupt changes can influence the social structures within which humans participated by altering ecological and economic aspects of society. Altering access to resources and how plants and animals behave influences shifts in subsistence patterns, which can have contingent effects on society. In essence, abrupt changes in climate systems which cross climate thresholds can act as punctuated events in human cultural systems, altering human behavior and the makeup of societies. In this sense, understanding of climate thresholds ties into a macroevolutionary understanding of cultural change, in which cultures change in response to punctuated events.

Given this consideration of climate thresholds and how they relate to human action and cultural change, determining if such thresholds existed in the late Holocene of the American Midwest may provide a line of evidence for interpreting archaeological trends. By design this research question is more inductive than preceding questions. It focuses on characterizing climate change between AD 500-1500 in the American Midwest and identifying potential climate thresholds which may have influenced human behavior. The end result will be a temporal and spatial understanding of prehistoric climate in this region, focusing on punctuated events and climate thresholds that may have influenced development and change in prehistoric societies. These trends will then be used as one line of evidence in interpreting the archaeological data generated through the previous three questions.

Summary

The questions outlined above represent inductive and deductive approaches to understanding cultural change in the Middle Ohio Valley and Eastern Woodlands at multiple scales. Scales operate from small (site-based) to large (supra-regional trends) and questions are nested within findings from each scale below. These scales are anchored through the Turpin site, which is characterized at the site-level and linked to
subsequent scales through material culture and community traits to regional (early Fort Ancient) and super-regional (Mississippian) trends, all of which is set against the backdrop of changes in the regional climate system. Archaeological data are generated to address questions regarding the prehistoric communities at Turpin. These data are then compared with contemporary sites to generate an understanding of the early Fort Ancient system. Patterns identified at this level are used to compare with early Mississippian communities throughout the Midcontinent in order to address questions regarding the nature of Mississippian influence on the development of early Fort Ancient communities. Once these levels are understood, characterization of the regional climate system during this time period will help provide a backdrop against which cultural patterns can be interpreted.

An important issue to consider when working at multiple scales is the ecological fallacy, which refers to issues of “linking results obtained at one scale of analysis to those obtained at another” (Harris 2006:46), particularly when applying findings from higher levels to lower levels. This project attempts to mitigate the effects of the ecological fallacy by working from the lowest analytical scale (i.e. the site) and creating archaeological links between site/region scales and site/region/super-region scales. Bridging these scales relies on characterizing assemblages of material culture, site structure, and community organization of multiple sites, and understanding the similarities and differences in these traits. Patterns produced at these levels are used to explore questions of population movement, the motivations behind migration, and the linkages between climate change and cultural change using a macroevolutionary framework. By doing this, I would not be saying that patterns identified at Turpin are indicative of the greater Fort Ancient system, nor would I be saying that broader patterns identified at the regional level can be used to characterize individual sites, each of which is an example of the ecological fallacy. I circumvent these issues by working within and between scales, and not assuming that findings at one scale reflect patterns at another.
Chapter 4: Culture History Overview

When Spanish explorers encountered the native inhabitants of what is now the southeastern United States, they encountered a broad range of societies practicing agrarian lifestyles and living in large, circular towns and villages (e.g., Clayton et al. 1995). This was assumed to be a lifestyle of great time-depth; corn and villages became synonymous with Native Americans east of the Mississippi. However, subsequent research has shown that this maize-based lifestyle was a relatively novel (~600 years) development at the time of European contact in this region. Maize itself is a nonlocal crop that was domesticated in the highlands of central Mexico (Piperno and Flannery 2001). Those North American societies who lived for the roughly 12,000 years before the introduction of maize agriculture practiced a foraging lifestyle and subsisted on locally available resources (e.g., Smith 2001).

A question underlying the present study is how and why this agrarian lifestyle spread, becoming almost ubiquitous throughout the Eastern Woodlands by AD 1500. To do so, Turpin, a key transitional site in the Middle Ohio Valley is used as a case study. In order to provide the context within which this transition occurs, an understanding of the history of cultural development in this area is necessary. This chapter provides an overview of the Late Woodland (AD 500-1000) and the Late Prehistoric (c. AD 1000-1650) periods of the American Midwest, including Fort Ancient societies and the broader Mississippian system. Particular attention is given to Late Woodland and Fort Ancient societies in the Middle Ohio Valley, since both groups occupied the Turpin site and straddle the time when maize became a staple crop in this region.
**Late Woodland**

"Any attempt to characterize Late Woodland societies across the entire Southeast requires gross generalizations about communities that were in reality historically and culturally diverse" (Nassaney 2001:161).

As the preceding quote by Nassaney suggests, the Late Woodland period in the Southeast, and I would argue in the Midwest as well, was a time of cultural and historical diversity. While necessary for an overview of broad themes during this time period, generalization masks considerable variability in cultural systems. For many years, the Late Woodland period (c. AD 500-1000) was considered as a time of cultural decline after the large-scale building efforts and trade networks of the Middle Woodland (i.e. Hopewell) period, and before the development of Mississippian societies. The discrepancies between these periods led one author to describe Late Woodland societies as "good grey cultures" (Williams 1963:297), reflecting their seemingly unremarkable material culture and social systems. However, work in recent decades has shed light on the shift in complexity of social arrangements during this period (Cobb and Nassaney 1995; Emerson et al. 2000; Nassaney 2000, 2001; Nassaney and Cobb 1991). Instead of a disintegration of social ties across the Eastern Woodlands, this period is now seen as a time when connections were reformulated and effort was refocused on strengthening regional ties as opposed to the inter-regional trade networks of preceding centuries.

McElrath et al. (2000) suggest that three key transformations occurred during the Late Woodland period across the Eastern Woodlands. It is important to consider these transformations as part of the backdrop against which local trajectories unfolded. A common theme among these shifts was the diffusion of traits into the region from various sources, which implies a general connectedness of populations through trade, despite evident segmentation. Historical processes that unfolded during this period set the stage for the development of marked social inequality in some areas and the spread of Mississippian culture throughout much of the Eastern Woodlands and thus represent a critical first step to understanding inequality, migration, and cultural hybridization.

The first transformation that occurred during the Late Woodland period is that of social and economic reorganization. After approximately AD 400, the social, economic, and ritual relationships that dominated regional and interregional connections during the
Middle Woodland period ceased. This post-Hopewell time was a period of cultural segmentation and 'Balkanization' in which the range of interaction decreased and cultural heterogeneity dominated, as suggested by increases in ceramic diversity in many regions (McElrath et al. 2000). However, this was not the decrease in complexity that some scholars suggest, but instead a shift in how people interacted.

The second transformation identified by McElrath et al. (2000) was the introduction of the bow and arrow into the region. This technological advancement allowed for greater mobility and hunting efficiency, as well as increased ability to conduct warfare (Blitz 1988; Milner 1999). It is unclear from where this innovation originated and spread, although Seeman (1992) suggests that eastern connections during this period may point to a northeastern origin. The introduction of this technology is marked archaeologically by a decrease in large dart points and the appearance of small arrow points (i.e. Levanna, Jack's Reef, Madison [Justice 1987]) in archaeological assemblages. In most areas, this transition appears to have occurred during the latter half (post-AD 700) of the Late Woodland period.

The final transformation during the Late Woodland period was the diffusion of maize into some regions of the Eastern Woodlands. The introduction of this crop was time-transgressive, however, appearing in different regions at different times (Nassaney 2001; Simon 2000, 2014). The sequence and geographical spread of this crop is not well understood, and there are conflicting stances on the importance of maize in Late Woodland economies. Hart (1999; Hart and Lovis 2013) suggests that maize was present in Woodland subsistence systems in the Northeast dating as far back as 300 B.C.. Simon (2014), however, finds little compelling evidence of maize in Late Woodland contexts in Western Illinois and the American Bottom; maize only appears to have entered this region after AD 900, becoming a staple for later Mississippian societies.

The role that maize played in Late Woodland societies is thus largely in question. It may have been introduced multiple times and failed more often than not, accounting for early dates in Ohio (Edwin Harness Mound) and Tennessee (Icehouse Bottom [Chapman and Crites 1987]). However, even if maize was available in low amounts, isotopic evidence suggests that it did not become a staple crop in these regions until AD
900/1000 (Greenlee 2002). Alternatively, Simon's suggestion that maize is not visible in archaeological contexts in the American Bottom simply because it was not there may apply to the broader Eastern Woodlands. If true, maize may not be as transformative as suggested by McElrath et al. (2000) throughout much of the region, at least until the very end of the Late Woodland period. If this is the case, the introduction of maize may have played a catalyzing role in the historical processes which resulted in the Mississippian emergence c. AD 1000.

Although societies differed in many ways throughout the Southeast and Midwest, particularly in the face of the transformations noted above, they did share similarities in subsistence and settlement patterns. In general, populations subsisted on local cultivated crops, and are typically classified as low-level food producers (Smith 2001). In this sense, Late Woodland societies were continuing a lifestyle that originated in the Archaic and earlier Woodland periods, in which the domestication and cultivation of Eastern Agricultural Complex crops provided a large portion of the subsistence base. It was not until late during this period (c. AD 900), and only in a few locations, that maize became a staple crop.

Late Woodland settlements were diverse. Some societies lived in nucleated villages, while others exhibited seasonal mobility patterns and lived in temporary camps. An important note is that the location of Late Woodland settlements rarely coincide with Middle Woodland or Mississippian groups (Nassaney 2001). This suggests that Late Woodland populations lived different lifestyles in regard to subsistence, settlement, and interaction than either preceding or subsequent groups. Nassaney (2001:163) interprets this disconnect as an indicator of sociopolitical instability and the inability of leaders to legitimize their authority with surpluses. He goes on to suggest that "a picture emerges of a rather fragmented social and political landscape composed of relatively small, locally integrated social groups brought into contact by short-term alliances, only to be disintegrated by irregular (though perhaps frequent), short-distance movements of individuals and groups." As noted, the general conceptualization of Late Woodland has progressed from a simplified collapse model to one of complex, fragmented societies with unique sociopolitical histories.
The Late Woodland Period in the Middle Ohio Valley

In Ohio, the Late Woodland period is divided into early (c. AD 400-700) and late (c. AD 700-1000) sub-periods based on perceived differences in material culture and ways of life (Seeman and Dancey 2000). The early portion of the Late Woodland, immediately after the Hopewell decline, is considered a period of brief aggregation, particularly along river bluffs and terraces (Burks 2004; Dancey 1988, 1992; Griffin 1952; Oehler 1973). Using an evolutionary framework, Dancey (1996) suggests this process may have begun as a response by peripheral groups to large-scale Hopewell networks, and it was nucleated communities that ultimately persisted. However, the relative paucity of fieldwork conducted at these sites, coupled with radiocarbon ranges that sometimes span hundreds of years (e.g., Seeman and Dancey 2000:588; Shott 1992: Figure 2) has made it difficult to determine whether these sites represent proto-villages or persistent places seasonally occupied by small populations (Clay and Creasman 1999). Well-known sites from this period include Straight (Burks 2004), Water Plant, and Zencor in central Ohio (Dancey 1988, 1992), Turpin and Sand Ride in southwest Ohio (Riggs 1998), Pyles (Railey 1984) and Hansen (Ahler 1988) in Kentucky, and Childers and Woods (Shott et al. 1990) in West Virginia.

In a broad sense, these early Late Woodland settlements are classified under Griffin's (1952) Newtown Focus. Newtown, a culture-historic taxon that was largely defined based on limestone/rock tempered, cord-marked pottery, and a single structure and dense midden at Turpin (which were interpreted as evidence of a village), often acts as a catch-all for sites that date to this period. The most glaring issue is the "Newtown Cordmarked" ceramic type, which originally was identifiable by its 'diagnostic' angular shoulder, cord-marked surface, and crushed rock (limestone or igneous) temper. While vessels with distinct angular shoulders may reflect a temporally diagnostic vessel form, there are two issues. First, these vessels have not been directly dated in a systematic fashion, leaving their temporal diagnosticity in question. Second, the importance of this form has prompted some to extend its diagnostic character to sherds that are cord-marked and rock-tempered (e.g., Railey 1984). This has led to the designation of a number of
sites as part of the Newtown focus based on tenuous artifactual and chronological data. This label carries with it assumptions of nucleated villages (Clay and Creasman 1999), meaning that when cordmarked, rock tempered ceramics are recovered from sites there is a danger of categorizing them as Newtown villages, without detailed examination of site structure or chronology. Reexamination of assemblages and sites, coupled with targeted dating of ceramics, is needed to help clarify cultural dynamics and archaeological constructs during this important time period.

The late Late Woodland period in Ohio is notable for a shift toward a more mobile lifestyle concurrent with the introduction of the bow and arrow (Seeman 1992; Seeman and Dancey 2000). Perhaps as a result of this increased mobility, few large sites are known in the region. Potential exceptions occur in the lower Miami Valleys, and include Sand Ridge (Riggs 1998), Haag (Reidhead 1976), and Turpin (Oehler 1973; Riggs 1998). Each of these three sites are large, complex and have multiple components with potentially mixed middens (Clay and Creasman 1999), suggesting that thorough examination is necessary before these are confidently classified as large late Late Woodland settlements or villages. There are very few well-documented sites with clearly defined late Late Woodland components from this time period. The only late Late Woodland site located in the Miami Valleys is Clark (Church and Cook 2016). This site reflects a short-term, repeat use camp with spatial clusters relating to Jack's Reef, Levanna, and Madison triangular points.

A critical article by Clay and Creasman (1999) written in response to widespread assumptions of village life during this period asks "where's the beef?" The issue, in this case “involves archeologists’ expectations of the settlements they excavate in the Middle Ohio Valley, thorny problems of site context, sampling, and the interpretation of early excavated data, together with the more direct interpretation of specific archeological features” (Clay and Creasman 1999:1). The authors examine each case of supposedly nucleated villages often cited in the record of the Middle Ohio Valley, concluding that many of these areas likely reflect repeat-use, seasonal camps at persistent places on the landscape. After reviewing the literature on these sites, much of which is in difficult to find or access site reports, I tend to agree with this assessment. We don't confidently
know what we think we know. Evidence for nucleated villages is tenuous at best. Available data appears to better reflect seasonal use camps of mobile foragers. I wholeheartedly agree with Clay and Creasman's call for additional fieldwork at these sites. The paucity of work during this period focused on examining factors such as settlement, site structure, and diachronic change is one issue which prompted the present study.

**Mississippian Culture**

"As a most common denominator, 'Mississippian' is probably nothing more than an ill-defined constellation of traits involving subsistence, settlement and technology" - Feathers and Peacock (2008:289).

As this quote suggests, there are definitional issues when considering what Mississippian culture was and what traits characterize it. These issues arise from temporal and spatial variation evident across much of the Midcontinent, variation which was condensed into "Mississippian culture" by early culture historians. This section provides an overview of Mississippian societies, taking into account this variation while also parsing characteristics which might help identify these groups archaeologically. The goals of this section are to develop a set of traits and processes to accurately characterize Mississippian societies and to create a framework with which to compare excavated assemblages in the Middle Ohio Valley.

After approximately AD 1000, a new way of life spread throughout many river valleys of the Midwest and Southeast, reflecting a "wide variety of adaptations made by societies which developed a dependence upon agriculture for their basic, storable food supply" (Griffin 1967:189). These agrarian societies are referred to throughout the Eastern Woodlands as "Mississippian." While many point to agriculture and a storable surplus as defining criteria of this culture (e.g., Griffin 1967, Milner 1998; Muller and Stephens 1991), the question of "what is Mississippian?" is notoriously difficult to answer (e.g., Blitz 2010; Cobb 2003). This may be because the concept of Mississippian has changed with ebb and flow of theoretical paradigms (e.g., Smith 1984). In early classificatory/descriptive approaches (e.g., Philips et al. 1951), basic traits such as ceramic characteristics and elements of site structure (i.e. mounds and plazas) were used
to generate a normative definition of Mississippian culture throughout the Eastern Woodlands. In essence, these characteristics acted as proxies for people; as traits changed, so to, it was assumed, did people. Processual approaches focused on the adaptation of emergent Mississippian societies to floodplain habitats and the introduction of maize (e.g., Muller and Stephens 1991; Smith 1978). Closely related to this adaptation was storage and the generation of surplus, and how these were linked to the rise of social inequality. Stemming from this approach was a focus on understanding prestige goods economies and the mechanisms elites used to gain and maintain power (e.g., Brown et al. 1990; Peregrine 1995). More recently, scholarly focused has shifted away from constructs like chiefdoms (Pauketat 2007), and toward the importance of historical events, individual agency, practice, and cultural hybridity (e.g., Alt 2006; Beck and Brown 2011; Beck et al. 2007; Blitz 2010; Pauketat 2001, 2007; although see Beck 2013). Tied with this focus is a trend toward conceptualizing the rise and spread of Mississippian culture through the lens of religion, missionaries, migration of individuals and communities, and the spread of a larger worldview (e.g., King 2007; Pauketat 2002).

Briefly touching on these diverse perspectives again raises the question of what is Mississippian? Or perhaps more appropriately, what did it mean to be Mississippian? Is it merely a set of abstract archaeological traits? Was it a set of adaptations? A set of economic links between elites? A shared religion and worldview? The difficult and likely correct answer is all of the above and more; holistic examination of Mississippian culture must include elements of each perspective. The overview presented below attempts to incorporate these perspectives into a generalized understanding of Mississippian culture. Patterns in subsistence strategies, settlement systems, and material culture are highlighted, while also considering the historic processes of Mississipianization (sensu Pauketat 2002) and cultural hybridization.

Mississippian Subsistence and Settlement

As Griffin (1967) noted, Mississippian subsistence patterns centered on maize agriculture. For the first time, people began to aggregate in relatively dense communities for purposes related to planting, tending, and harvesting this tropical crop. The surplus
generated from maize is thought to underlie the development of complexity in this region (e.g., Milner 1998; Muller and Stephens 1991). Charred remains, the remains of agricultural fields (e.g., Fowler 1969), and isotopic examinations of diet (e.g., Schurr and Schoeninger 1995) all point to the importance and ubiquity of this crop at Mississippian sites. Although maize was present at sites throughout this region prior to AD 1000 (e.g., Chapman and Crites 1987; Hart and Lovis 2013), it does not appear to have been a significant part of prehistoric diets until after AD 900 in the American Bottom (Simon 2014).

A key element of Mississippian settlements is a planned site grammar linked to a broader shared cosmology (Lewis et al. 1998). Three types of Mississippian sites are generally recognized, towns, mound centers, and outlying settlements. Mississippian towns were composed of habitation areas arranged around a communal space like a plaza (Lewis et al. 1998:5). These communal spaces typically, but not always, had a mound close by. Mound centers were ritual spaces that did not typically include habitation areas but contained earthworks of some sort (e.g., Rafferty 1995). The importance of plazas in a greater architectural grammar is worth noting. Lewis et al. (1998:15) suggest that "...plazas are public areas, where individuals interact and community consensus is built. They are not independent worlds within a community; they are a means of orientation and a representation of shared community spatial concepts." More broadly, Rautman (2000) sees plazas in general as a venue of community integration, an important consideration in coalescent, growing communities. In essence, the plaza was a place where community was made and enacted, problems resolved, and a place where individual households integrated into a meaningful whole. Mississippian plazas were a key element of a larger ethos reflecting a shared cosmology.

Smaller plaza-oriented communities, not specifically mentioned by Lewis et al. (1998), represent a third type of Mississippian site. These sites reflect more of a village than a town in size, with lower population densities and a general lack of administrative complexes. Many of these sites were not within the direct sphere of influence of a chiefdom center, but people in them still lived a qualitatively Mississippian lifestyle. This category possibly includes settlements like Richland Complex communities (Alt 2002,
2006), although these have been argued to be economically tethered to Cahokia. Additionally, sites argued to reflect Mississippian colonization like Audrey, in the Lower Illinois Valley, appear to be small, relatively egalitarian plaza-oriented communities (Delaney-Rivera 2004). Although these sites are not discussed as often as primary and secondary centers, it is important to consider these smaller village communities as part of the Mississippian system.

In the middle of the 11th Century, a novel form of Mississippian household architecture rapidly increased in popularity in Cahokia, eventually spreading throughout much of the Midwest. Wall trench architecture, a traditional hallmark of Mississippian societies (e.g., Griffin 1967), involves the excavation of a trench, within which a prefabricated wall is placed (see Alt and Pauketat [2011] for a discussion of this method). This differs from earlier methods of construction that involved digging holes for each wall post (referred to as set-post architecture); the archaeological signature of these methods is distinct. Wall trench architecture has been argued to reflect Mississippian culture, in that building houses in this fashion tied into a larger Mississippian cultural grammar (Alt 2001, 2006; Alt and Pauketat 2011). Alt and Pauketat (2011:111) suggest that this form of architecture is "part and parcel of the transregional Mississippianization process" and that "wall-trench construction was inextricably linked to a cult-like spread of a new cultural and political order." This stance suggests that the presence of this house form implies participation in a broader Mississippian system.

Tracing the spread of wall trench architecture out of the Central Mississippi Valley, Pauketat (2007) notes that this style originated in Cahokia around AD 1050. It spread quickly north and south, spreading as far as Eveland in Illinois and Moundville in Alabama by AD 1100. By AD 1150/1200 this style spread throughout most of the Southeast. An important trend noted in this map is a series of early enclaves of wall trench communities. These are present in southern Wisconsin at approximately AD 1050, and in Alabama and Georgia around AD 1100. This pattern points to early Mississippian communities spreading throughout the Mississippi Valley and beyond. The state of the Middle Ohio Valley in this map is unclear. The limit of this style up the Ohio River is approximately at Prather, at the Falls of the Ohio, suggesting that this form of
architecture did not spread beyond this point. An updated version of the map (Alt and Pauketat 2011) adds SunWatch (see Cook 2008), but more recent work suggests revision is again necessary since early Fort Ancient villages are marked by wall trench structures (Cook 2012; Cook and Genheimer 2015; Cook et al. 2015; Comstock and Cook 2016).

*Mississippian Material Culture*

Many Mississippian communities produced similar assemblages of utilitarian and ritual ceramic ware, although in many places different local types have been created to characterize them. Most of these local types are derivations of general themes. The first type is the most commonly found at Mississippian sites (e.g., Angel [Hilgeman 2000]; Wickliffe [Wesler 2001]), but has seen the least analytical attention. Mississippi Plain Pottery, which is generally defined based on shell temper, a lack of decoration, and plain or smoothed surfaces (Hilgeman 2000; McGill 2013; Phillips 1970), was the everyday utilitarian ware at many Mississippian sites. At the Angel site, this form constitutes the majority (92%) of the Mississippi Ware ceramic assemblage (Hilgeman 2000). McGill (2013) found significant variation with the Mississippi Plain type, alluding to differences in function, different utilization in different areas of the site, and the techniques and traditions of individual potters and families. Such site-level examinations of this ubiquitous, if unassuming, pottery type are an important element in understanding the everyday life of Mississippian people. Although this catch-all term of Mississippi Plain pottery undoubtedly condenses numerous meaningful types, production techniques, functions, and pottery traditions into one overarching 'type,' plain shell-tempered ceramics are considered as a quotidian Mississippian trait. Consideration of this type in regard to the movement of small communities is a key part of the present study.

On the other end of the spectrum of Mississippian ceramics are those purposefully designed and decorated to convey meaning, identity, and power. Symbols are an important method of conveying meaning, and ceramics offer multiple media with which symbols can be displayed (e.g., Hegmon 1992). Ceramics are thus an important avenue of exploring identity at both the site level and across regions. Multiple decorative techniques, including incising, punctating, burnishing, painting (both positive and negative), and the
use of colored slips, were used to produce pots, bowls, and other vessels in Mississippian communities that were steeped in meaning. Although this topic has been studied in great detail (Griffin 1943; Hilgeman 2000; Philips et al. 1951; Philips 1970; Steponaitis 2009), two particular types of decorated Mississippian ware will be discussed at further length.

The first is a set of designs known as *Ramey* or *Ramey-like*, that is thought to stem from the American Bottom and relate to elite authority and mythology in this region (Pauketat and Emerson 1991; Emerson 1989). Emerson (1989) suggests that the limited but specific contexts within which Ramey motifs are recovered points to a socio-ritual role. He goes on to suggest that the function of these rituals are likely integrative, and may reflect early versions of the Green Corn Ceremony, a common community ritual of renewal in historic Eastern Woodlands groups (Hudson 1976; Wallace 1956). In terms of the meaning of the motifs, it has been suggested that these spirals represent water, renewal, and the continuity of life (Emerson 1989). Pauketat and Emerson (1991) link the centralization and distance decay of *Ramey* motifs in the American Bottom to the centralization of authority at Cahokia and an attempt by elites to maintain hegemony over outlying communities.

A recent study of residues on vessels with *Ramey* motifs and *Powell Plain* ceramics from Cahokia suggests that these vessels may have been used solely for the preparation of the black drink and other medicinal and ritual beverages (Miller 2015). These findings fit well with findings from a study of beakers from Cahokia and surrounding sites (Crown et al. 2012) which found consistent evidence of the ingredients needed for the black drink. Together, these studies suggest that *Ramey*-designed ceramics and other specialized vessels from Cahokia were used in ritual beverage production, and likely were instrumental in the serving and dissemination of these drinks. Use of the black drink was recorded ethnohistorically and it appears to have acted as a form of ritual cleansing before important activities (Crown et al. 2012).

The function and meaning of these ceramics in Cahokia proper may have "served to convey the Cahokian cosmos to the populace" (Emerson 1997:216). As people moved out of the American Bottom and colonized regions throughout the Midwest and Southeast, the symbolism tied to this set of motifs was likely reinterpreted. Instead of
socio-ritual ties to elites at specific polity centers, the meaning of these *Ramey* motifs may have transformed, focusing instead on maintaining connections with the Mississippian worldview in general. This trend was likely most common in early colonizer communities. As one example, the majority of *Ramey* or *Ramey*-emulation ceramic designs found in the lower Miami Valleys come from early Fort Ancient communities like Guard (Cook et al. n.d.), State Line (Vickery et al. 2000), and Turpin (Comstock and Cook 2016; Drooker 1997; Griffin 1943). Such early examples far from Mississippian centers may reflect attempts to maintain ideological ties via symbolism and ritual to distant homelands. The fact that many of these motifs are emulations may reflect a stylistic (and perhaps ideological) evolution stemming from initial migrant communities. This could explain why many early Fort Ancient motifs are curvilinear in nature.

A second form of decoration used among Mississippian potters was painting. Painting typically occurred in one of three ways (Wesler 2001). Positive painting involves the application of a pigment directly to the surface of a vessel. Negative painting involves applying a dark background to a vessel but leaving key areas blank; the voids form meaningful patterns. Slipping involves covering the entire vessel with colored pigment. In the Ohio Valley, this method of decoration is most common in the Lower Valley, toward the confluence of the Mississippi and Ohio Rivers. Sites like Wickliffe, Kincaid, and Angel produced significant numbers of painted vessels (Hilgeman 2000; Wesler 2001). Angel, in particular, is notable for its negative painted plates, bowls, and jars (Hilgeman 2000). Outside the Ohio Valley, sites in the Nashville basin also exhibit distinct negative painted motifs.

Often noted among Mississippian sites is an increase in the diversity of vessel forms and functions when compared to earlier sites (e.g., Hilgeman 2000). In Woodland contexts throughout much of the Southeast and Midwest, ceramic assemblages are composed primarily of large jars used for cooking and storage. In contrast, jars, bowls, plates, water bottles, beakers, salt pans, and other vessel forms appear at sites throughout the Mississippian world. It is during this time that ceramics became the predominant tool type among the societies of the Eastern Woodlands. This is reflected in the general
disparity in artifact types recovered from sites occupied during this time period; ceramics invariably dominate assemblages (e.g., Black 1967). The presence of vessel forms like bowls, plates, and pans can be used as an indicator of trade with and/or the presence of Mississippian people (e.g. Pollack et al. 2002).

An important technological characteristic of Mississippian ceramics is the use of crushed mussel shell to temper vessels (e.g., Philips et al. 1951). However, the origin, spread, and cultural affiliations associated with shell tempering are complex issues (e.g., Feathers and Peacock 2008). Based on its common appearance in stratigraphically late deposits, early archaeologists (e.g., McKern 1939) used shell tempering as part of the 'checklist' for Mississippian societies. As such, it became linked in the mind of many archaeologists with maize agriculture, sedentism, and Mississippian culture in general (Feathers and Peacock 2008). In reality, not all Mississippian potters used crushed shell, and not all shell-tempered vessels are Mississippian; variation exists across much of the Midwest and Southeast, both spatially and chronologically in regard to if and when this technology was adopted.

In Cahokia, shell was used as a tempering agent in low to moderate levels (20-30%) around AD 1000. After AD 1050, the frequency of shell in ceramics increased to well over 90%, and over 75% in outlying farming settlements (Pauketat 2001). Pauketat (2001) links punctuated changes, including the transition to shell-tempered pottery, to the historical events that catalyzed the emergence of Cahokia as a polity. Shell-tempered vessels were a large part of this novel arrangement, ranging from everyday cooking pots to community rituals. In many ways, they may have acted as overt indicators of these new social forms and this acted as participatory elements of an emerging ideological system.

Once one moves beyond questions of the initial genesis and reasons for the adoption of shell tempering, the link between the spread of shell as a tempering agent and the spread of Mississippian people/culture is compelling. Although diffusion and migration were considered mechanisms for the spread of shell tempering during the culture historic period (Feathers 2006), recent examples of this approach are more nuanced. In many regions, shell temper appears as a sudden addition to regional
sequences and a departure from local developments. In Lower Chattahoochee-
Apalachicola River Valley, for example, shell temper is one line of evidence used to
identify an influx of Mississippian migrants (Blitz and Lorenz 2002). In this situation, the
appearance of shell tempered ceramic assemblages that are distinct from earlier
assemblages is seen as an indicator of migration. This pattern may be useful in other
regions for aiding in the identification of migrant communities.

Feathers (2006:93) suggests that the pattern identified by Blitz and Lorenz (2002)
in northwest Florida is an outlier and that migration can be discounted in most areas
based on continuities in Late Woodland and Mississippian ceramic traditions. In the
Middle Ohio Valley, Feathers (2006:98) suggests that shell tempering was introduced at
approximately AD 600 and that the increase in frequency around AD 1000 is a result of
local developments. However, this supposition is based on one date from a multi-
component site (Rafferty 1974). Additionally, it is suggested that there is clear evidence
of continuity between Late Woodland and Mississippian assemblages. This assertion is
based on the recovery of shell tempered Newtown angled shouldered vessels, the rock-
tempered version of which are diagnostic of the Late Woodland period in this region
(Seeman and Dancey 2000). However, there is a danger of conflating all angled shoulders
with Late Woodland; Mississippian shell tempered vessels with distinct shoulders have
been recovered from this region (e.g., Griffin 1943). Cook and Fargher (2008)
alternatively suggest that shell tempering appears in the Middle Ohio Valley closer to AD
1000.

**Mississippian Social Organization**

A final criterion shared by many Mississippian societies is social inequality.
Classically referred to as chiefdoms, the characteristic portrayal of Mississippian
societies includes a chief living in a large structure on a temple mound and ruling over
the common members of society. Although formalized social inequality was likely
reserved to a chief/commoner dichotomy, informal hierarchies existed based on charisma
and skill (Hudson 1976:203). Ethnohistorically, chiefdoms and paramount chiefdoms
were common in the southeast (Ethridge 2010; Hudson 1976). The complexity evidenced
by these societies in terms of social organization, and the ability of elites to mobilize labor and tributes, stands in contrast to the essentially egalitarian lifestyles of their Woodland predecessors.

Beyond the level of the individual site, Mississippian groups were often characterized by the existence of distinct settlement hierarchies (Cobb 2003; Hudson 1976; Smith 1978). This pattern is perhaps most clear in the largest polities like Cahokia and Moundville. At these sites, the pattern consists of "a very large multi-mound center, subsidiary centers with a single or only a few mounds, sizable villages without mounds but often with plazas, and a hodgepodge of smaller settlements consisting of as few as one to two structures" (Cobb 2003:68). Such small villages or hamlets were tied into social, political, and religious events in the larger centers, but their inhabitants likely lived relatively egalitarian lifestyles on a day-to-day basis. In the American Bottom region, Pauketat (1994:75) identified a central/rural pattern in which rural communities contributed shelled maize to larger political centers, suggesting this relationship may have been extractive in nature.

Pauketat (2007) recently argued that the application of Sahlin's (1963) Polynesian chiefdom type of social organization to Mississippian society has been detrimental to the ultimate goal of understanding Mississippian societies. He suggests that the label of chiefdom for Mississippian groups creates a highly unrealistic conception of these polities as homogenous copies of one another. Instead, the history of each polity, although related to broader trends in the Mississippian world, followed a unique trajectory. Searching these ‘imaginary institutions’ of chiefdoms has framed archaeological method and theory against uncovering the specific historical processes involved in how chiefdoms rise and fall. The alternative suggested by Pauketat (e.g., 2001, 2007) is an exploration of the particular historical processes that contributed to the rise of social inequality in the development of ranked society.

Although typically considered as having ranked social organization, there is debate as to the magnitude of social inequality among Mississippian societies. Some scholars believe that chiefly positions were not considerably different than most other levels of society and that the power involved in Mississippian chiefdoms has been
exaggerated (Muller 1986). These economic approaches (e.g., Milner 1998; Muller and Stephens 1991) stress the importance of agriculture, the generation of surplus, and a related emergence of elites who managed these surpluses. The other side of this argument stresses political and ideological factors and how these related to the level of power in society (e.g., Emerson 1997; Knight 1986; Pauketat 1994). In essence, this stance posits that the political organization of Mississippian societies was governed and reinforced by the ideological power and legitimization of elite tiers of society.

Much of this debate focuses on the level of social inequality at polity centers like Cahokia, Moundville, Kincaid or Angel. Little attention has been given to whether this level of social organization extends throughout the Mississippian world. An important question to ask is whether or not all Mississippian societies demonstrated marked social inequality. Is it inherent to what constituted Mississippian culture, or is it merely overwhelmingly evident at large centers like Cahokia, Etowah, Moundville, Spiro, and a dozen smaller polities? Cobb (2003:67) suggests that a "large number of hamlets of uncertain affiliation were liberally sprinkled around the Southeast." What was the nature of political organization at these sites? Were they tethered to distant chiefly centers in an economic fashion or did they live egalitarian lifestyles but participate in a shared ideological system? These are important questions that reflect the disproportionate amount of research that has been conducted at polity centers as opposed to outlying communities. Addressing these questions may help shed light on the meaning of being Mississippian, both for archaeologists and the people we study.

Mississippianization

Discussion of the incorporation of outlying or peripheral communities into a broader Mississippian organizational and ideological system requires an understanding a process referred to as Mississippianization. This term is used to discuss the specific historical processes involved in becoming part of and participating in the Mississippian system (Pauketat 2002). It includes elements such as social organization, ritual practice, household architecture, and community arrangement. Tied to this process is the spread of people and ideas from primary Mississippian centers like Cahokia into peripheral regions,
ranging from the Illinois River Valley (Delaney-Rivera 2004) to Wisconsin (Price et al. 2007) to Georgia and Florida (Blitz and Lorenz 2002). In many ways this mindset harkens back to earlier models of the spread of Mississippian culture (see Smith 1984), although recent approaches, involving site-level and regional analyses, and biological data, are more nuanced and compellingly trace population movement.

Social change as a result of transformations in practice is at the heart of the Mississippianization process (Alt 2006; Pauketat 2001, 2007). This process is related to the idea of "culture-making" or "how people made themselves Mississippian" (Pauketat 2005:188). Culture-making is an active process that involves the intersection between everyday practice and the structures that form society (e.g., Giddens 1984). Alt (2006) makes a compelling argument that new identities in the farmlands outside of Cahokia were forged through culture contact and hybridization. Evidence points to a coalescence and in-migration of people from distant areas into the Richland Complex of agricultural villages in the uplands approximately 30 km southeast of Cahokia. Identities in these diverse “thirdspaces” (sensu Bhabha 1990) were formed through negotiation of local traditions and emerging Mississippian ideals. Evidence suggests that this process likely occurred in analogous situations where Mississippians came into contact with local groups (e.g., Blitz and Lorenz 2002; Delaney-Rivera 2004). The presence of migrant communities acts as a catalyst for cultural change.

*Early Mississippian Chronology*

A final point to consider is the timing of Mississippian cultural development, especially in the early portion of the Late Prehistoric period (c. AD 1050-1300). Cahokia will be used as a brief example of the rise and fall of a Mississippian polity in the context of environmental change. Isotopic and direct dating evidence suggests that beginning around AD 900, maize agricultural systems emerged in the American Bottom, followed by approximately 150 years of intensification (Simon 2014). At approximately AD 1050, events unfolded at Cahokia that fostered the rapid development of Cahokia as the foremost polity in the region (e.g., Pauketat and Emerson 1997). The Lohmann phase (c. AD 1050-1100) is marked by abandonment of Late Woodland settlement systems, large-
scale construction in a predetermined site layout, new ways of making houses (wall trenches), and the emergence of marked social inequality. Benson et al. (2009) have noted a relationship between these developments and a wet period in American Bottom history. It is suggested that these ameliorative conditions, which would have been optimal for growing maize and EAC crops, fostered population aggregation at and around Cahokia and also led to the development of upland farming communities like the Richland Complex (e.g., Alt 2002, 2006).

Subsequent developments at Cahokia during the Stirling phase (c. AD 1100-1200) allude to changes in the sociopolitical makeup of this settlement and its populace. Throughout the early Stirling phase, the trends of mound building and development of political/ritual administrative systems began in the Lohmann phase were continued. At approximately AD 1150, these practices appear to have waned sharply, and the construction of the first of numerous palisades was begun. Benson et al. (2009) note the strong association between these mid-Stirling phase shifts and the onset of numerous multi-decadal droughts starting around the mid-12th Century and lasting through the mid-13th Century. Such droughts may have affected the system of upland farming communities tethered to Cahokia as well. These Richland Complex farming communities, which appear to have participated in the Mississippian system and supplied surplus maize to Cahokia, were abandoned by the beginning of the Moorehead phase (AD 1200-1275). Benson et al. (2009:478) suggest that "...even if Cahokians attempted to maintain the social and political status quo, they would have done so in the face of people leaving Cahokia and, quite likely, the region surrounding Cahokia" (478). This disaggregation of people around Cahokia likely further influenced the decline of Cahokia and created numerous migrant communities searching for greener pastures.

Over the course of about 200 years, Cahokia witnessed a dramatic rise to power and influence, with connections spanning the midcontinent (e.g., Kelly 1999), and a steady decline marked by emigration. This general process, referred to as chiefdom cycling (Anderson 1994) or a fusion/fission process (Blitz 1999), appears to have been common throughout the Mississippian world (Cobb 2003). Little attention, however, has
been given to how the dispersal of people from these centers throughout their lifetimes influenced development on the peripheries.

Summary

In this section, I have provided a basic overview of commonalities held by most Mississippian societies and some of the characteristics that are used to define them. With this in mind, I suggest that Mississippian culture reflects a generalization of societies living in the Eastern Woodlands between AD 1000 and European contact which (i) depended on maize agriculture for the majority of their subsistence; (ii) lived in villages or towns arranged according to a shared site grammar; (iii) constructed houses using wall-trench techniques; (iv) utilized primarily crushed mussel shell to temper ceramics; and (v) lived lifestyles ranging from egalitarian to ranked. These characteristics, while general and neither mandatory nor exclusive, constitute the understanding of Mississippian used in the present study.

Fort Ancient

"Fort Ancient is a construct of archaeologists conceived in error, perpetuated by conceptual rigidity, and misinterpreted by some serious and some imaginative archaeologists" - Griffin (1993:53).

Along the Middle Ohio River and its tributaries, societies that lived in large villages and practiced maize agriculture between AD 1000 and AD 1650 are referred to as Fort Ancient (Cook 2008; Drooker 1997; Essenpreis 1978; Graybill 1981; Griffin 1943; Henderson 1992; Pollack and Henderson 2002; Pollack et al. 2000) (Figure 4.1). Stretching from present-day southeastern Indiana to West Virginia and from central Ohio to the Bluegrass Region of Kentucky, these farming societies are one of the most archaeologically visible cultures in the region. Griffin (1993) defines Fort Ancient as the result of gradual adaptation of Late Woodland societies to broader transitions (i.e. maize agriculture) in the Midcontinent. In this sense, these societies are thought to reflect adaptations similar to neighboring Mississippian groups, but are generally held to have developed independent of contact with these societies (e.g., Pollack et al. 2002). Prevailing theories regarding the origins and development of Fort Ancient culture invoke
autochthonous change, a gradually developed reliance on maize, population aggregation, and minimal contact with other groups until late in this sequence (after AD 1400). In addition to these gradual changes in lifestyle, it is held that crushed shell as a tempering agent in ceramics, along with complex design elements and handles on jars and a diversification of ceramics vessel types, gradually developed in association with larger community aggregations (Henderson and Turnbow 1992).

With typical eloquence, Griffin (1993:53 - see quote above) suggests that there are critical issues with Fort Ancient as an archaeological construct. It is odd that much of the foundation of Fort Ancient studies stems from Griffin (1943) himself; indeed, his foundational work may have led to many of the issues he cites (Henderson and Turnbow 1992:12). It is true that the Fort Ancient construct suffers from 'conceptual rigidity;' regional differences have not been systematically explored and there is a generally poor control on chronology. This has led in some cases to insularity and a tendency to reify regional phases and traditions. However, a history of strong archaeological research in this region (e.g., Cook 2008; Drooker 1997; Essenpreis 1982; Graybill 1981; Henderson 1992; Pollack and Henderson 2016) have produced considerable support for a general shared set of adaptations and social norms reflecting a Fort Ancient cultural group. This does not mean that there is no room for clarification and modification, just that Griffin's assessment may be a bit patronizing and defeatist.

**Cultural/Chronological Schemes in Fort Ancient**

Numerous cultural schemas reflecting the placement of sites within regional chronologies have been developed to account for the spatial and temporal variation between Fort Ancient sites (Cowan 1987; Henderson et al. 1992; Graybill 1981; Griffin 1943; Prufer and Shane 1970). The seminal delineation was conceived by Griffin (1943), who used ceramic styles to define four 'foci' in the Fort Ancient 'Aspect' (Figure 4.2). Following McKern's (1939) taxonomic method, these foci, all of which fall under the larger heading of Fort Ancient, reflect roughly contemporary but geographically bounded groups of sites. These foci include Baum (central Ohio), Feurt (southern Ohio and
northern Kentucky), Anderson (northern Miami Valleys), and Madisonville (southern Miami Valleys and north-central Kentucky).

Of particular interest is the Madisonville Focus, which includes the primary region of interest for this study. This Focus is derived primarily from the Madisonville site, one of the best known sites in the region at the time of Griffin's work, although also includes material from the Fox Farm site in Kentucky. The Madisonville Focus contains the most sites and in general the largest villages (Griffin 1943:188). In regard to pottery at sites in this Focus, Griffin (1943:192) suggests that "That the basic pottery tradition which dominated the Madisonville Focus is Middle Mississippi there can be no doubt, and it alone of the four foci has completely shell-tempered ware. The vessel shapes... the varieties of jar-shaped vessels, the strap and lug handles, the effigy-headed bowls, the round-bottomed jars, and the incised decoration, particularly the curvilinear designs, indicated Mississippian connections." From this description it is clear that sites in the southwest of the Fort Ancient Aspect stand apart from those in other regions in their distinct similarity to Mississippian sites in the Lower Ohio and Central Mississippi Valleys.

The issue with Griffin's scheme is that it lacks a chronological component; temporal variation is condensed into ahistorical geographic units. Subsequent work has helped refine this chronological deficit through the Fort Ancient region. The following sections reflect amendments to Griffin's foci, organized primarily by region.

**Southwest Ohio**

In the Miami Valleys of southeast Indiana and southwest Ohio, Cowan (1987) classified sites to the Turpin Phase (AD 1000-1250), the Schomaker Phase (AD 1250-1400), and the Mariemont Phase (AD 1400-1670). Cowan is one of the few scholars during this time who was comfortable thinking outside of culture-historic boxes and acknowledging non-local connections. The Turpin Phase, of which Turpin is the type-site, is identified by a rapid transition to village-based maize agriculture. It also includes primarily plain shell tempered pottery, along with designs that are suggested to mimic those of Mississippian groups. Cowan (1987:15) suggests that "Turpin Phase pottery and
other artifacts clearly reveal the impact that societies outside the Tri-state area had on the emerging Fort Ancient peoples." Also evident are the earliest incidence of handles on vessels, as well as wall trench houses. Burial patterns focused on communal mounds, such as the one identified by Oehler (1973) at Turpin. Overall, Cowan links developments during this time period to western connections down the Ohio River.

The Schomaker Phase is described as one of lower population density, but considerably more "baroque" than the preceding Turpin Phase. This phase is marked by highly decorated pottery, including guilloche patterns, line-filled triangles, and punctations. Villages retained their circular arrangement around a plaza, although structures at these sites are thought to have been semi-subterranean pit houses. Also new to this phase is the development of large, cylindrical storage pits, thought to be used for storage of maize. It is during this time that a shift in mortuary patterns is evident, from the mounds of the Turpin Phase to a delineated ring of burials around the central plaza. This pattern becomes crystallized as part of the Fort Ancient pattern during the Schomaker Phase, and is evident at SunWatch (Cook 2008) and other villages throughout the region.

The Mariemont Phase reflects what some refer to as the Madisonville Horizon (see Drooker 1997). This horizon-marker includes shifts in site locations, ceramics, and burial patterns. Ceramics in this phase are largely undecorated, have flared rims, and a diagnostic 'pie-crust' rim decoration. Handles become more standardized, typically including four finely made handles per vessel. The circular village pattern disappears, replaced by "hodgepodges of houses with no particular village arrangement" (Cowan 1987:19). Houses were typically three to four times larger than those in earlier phases, potentially representing a shift from nuclear to extended family households.

**Central Ohio**

Prufer and Shane (1970) added a temporal dimension to Griffin's original concept, creating chronological phases for the Fort Ancient Tradition in the Scioto Valley and surrounding regions. It is important to understand that these phases were conceptualized using the migration framework developed through work at Blain Village (Prufer and
Shane 1970). Put briefly, the authors suggest that Blain reflects an intrusive community of Mississippians. Their ideas regarding each Fort Ancient phase reflect this assumption.

Regarding the Early Fort Ancient period (AD 950-1250), Prufer and Shane (1970) define the Baum Phase for Central Ohio, the Baldwin Phase for Eastern Ohio, and the Brush Creek Phase for Western Ohio. Within this time period, the Baum Phase is marked by Mississippian contact, as evidenced by circular communities, plazas, associated burial mounds, and ceramic assemblages containing shell tempered vessels. Baldwin and Brush Creek Phases are seen as more localized (i.e. Woodland) settlements, as they lack circular layouts, plazas, and primarily have rock tempered cordmarked ceramics. The relationship between these phases is that of intrusive communities (Baum Phase) and acculturation settings (Baldwin and Brush Creek Phases).

During the Middle Fort Ancient period (AD 1250-1450), two phases are evident, reflecting "lineal descendents" (Prufer and Shane 1970:263) of previous phases. The Feurt Phase of central and eastern Ohio is seen as a spread of divergent characteristics from the Baum Phase (i.e. shell tempering, circular villages), a spread which is seen to have supplanted more localized Baldwin Phase traditions. The Anderson phase of western Ohio is seen to be a continuation of Brush Creek Phase traditions. Western Fort Ancient is thus seen as a relatively Woodland adaptation in comparison to the central Scioto Valley. This is distinctly different from interpretations of this region by Griffin (1943) and Cowan (1987).

The Late Fort Ancient period (AD 1450-1750) is marked by a decline of regional differences and appearance of shared traits throughout much of the region. Prufer and Shane (1970:263) note that this period is the most "complex and diversified Fort Ancient unit." As the other regional overviews suggest, the Madisonville Horizon appears to have been a departure from preceding Fort Ancient developments.

**Northeastern Kentucky**

Henderson et al. (1992) developed a chronological system of phases based on an analysis of five key sites in northern Kentucky. The first, ranging from AD 1000-1200 is the Croghan Phase. Many elements of this phase reflect continuity with preceding Late
Woodland societies, although subsistence and settlement patterns differentiate sites in this phase. Sites included in this phase are Feurt, Thompson, and Scioto County Home, all in the general Scioto/Ohio Rover confluence area. In general these sites are poorly understood and appear to have multiple components. In many ways it is similar to the Baum Phase of central Ohio, but the given the distance, the authors decided "that the assignment of these sites to the Baum phase would have unnecessarily diluted its concept" (Henderson et al. 1992:255). Vessels are all Baum-series jars and are typically rock-tempered, with a small number of shell-tempered sherds recovered. Projectile points are all Type 2 (see Railey 1992). Subsistence patterns reflect a shift to maize, supplemented with wild plants and nuts. Although very little is known about site size, community structure, or household architecture, the authors suggest (based on comparisons with eastern Kentucky sites) that these sites were small and composed of small set-post structures.

Manion Phase (c. AD 1200-1400) sites exist on the floodplains and terraces of the Middle Ohio River as well as in some ridge tops in northern Kentucky. The Fox Farm ceramic series characterizes this phase, but ceramics in this period are marked by variability and an increase in shell temper. Jar forms still resembled Late Woodland precursors. Decoration is variable and distinct. Angular incised line motifs like chevrons and line-filled triangles dominate, although some curvilinear guilloche is present. Projectile points are predominately Type 3 (see Railey 1992), although types 2 and 5 are commonly present as well. Subsistence, much like the preceding Croghan Phase, was dominated by maize, along with beans and squash. Settlements during this phase are larger and occupied longer than previous times, and are arranged in circular or linear patterns. Houses were constructed using dug wooden posts and contained only central hearths. Based on a small sample, average structure size was 52 square meters, suggesting that they were inhabited by 9-12 people (Henderson et al. 1992:265).

After the changes associated with the Madisonville Horizon around AD 1400, two phases are defined, delineated largely based on the presence of historic artifacts. The Gist phase extends from AD 1440-1550, while the Montour Phase extends from AD 1550-1750. Gist phase villages are generally poorly understood; collections are derived
primarily from surface surveys and private collections. Sites are assigned to this phase by the presence of Madisonville-style ceramics. In general, subsistence patterns remain relatively consistent from previous phases. Villages are thought to have been more permanent and larger than before, although most were arranged in a linear fashion. However, very few have been extensively excavated, so patterns are tenuous. In general, the inclusion of new ceramic vessel types, such as bowls, plates, and pans is thought to reflect an increased association with neighboring Mississippian communities. The Montour Phase generally represents the continuation of trends seen in preceding phases, including larger villages, higher population density and increased indicators of non-local connections. Some communities toward the end of this period may reflect multi-ethnic, coalescent populations. Key among these is the presence of European trade goods toward the end of this phase.

Summary

Griffin's (1943) taxonomic system and the regional amendments summarized above frame how many scholars consider Fort Ancient culture. Variation is neatly partitioned into regional entities and temporal categories. Although these categories allow archaeologists to talk within and between regions, their very makeup may be the rigidity Griffin was referring to in the quote that began this section. As Brew (1946:44) notes, "we are dealers in conceptual schemes, and we must keep before us at all time the realization that we are dealing with them." There is a danger of reifying these categories in theory and in practice, and making derived geographic and temporal borders real in one's mind. The ability to revise these categories as new data are acquired is critical, otherwise data are forced into these schemes, which become static, rigid, and further from representing reality. With these caveats and dangers in mind, the general temporal breakdown used in the present study follows Cowan's (1987) framework. It was constructed using data from the immediate region in question and in appears to accurately reflect dynamics in the lower Miami Valleys. Following this scheme, Fort Ancient is broken into Early (AD 1000-1250), Middle (AD 1250-1450) and Late (AD 1450-contact)
periods. It should be noted that these are not considered entirely arbitrary boundaries, but appear to reflect meaningful breaks in the archaeological patterning of this region.

**Fort Ancient Material Culture**

*Ceramics*

Ceramics are the most common artifact type recovered from Fort Ancient sites, a fact which points to their importance prehistorically. Typically, local clays were used to make large globular jars and at some sites bowls, plates, pans, and pipes. Vessels were typically tempered with crushed mussel shell, crushed rock, limestone, and less commonly, sand and grog. Ceramic vessels were used for a number of activities, including cooking, storage, and serving meals. They also acted as one of the most visible media for the portrayal of symbols at the individual, family, and community levels. As such, studying technological and design aspects of ceramic assemblages has long been a key element of Fort Ancient studies (e.g., Cook 2008; Cook and Fargher 2008; Drooker 1997; Griffin 1943; Turnbow and Henderson 1992).

Turnbow and Henderson (1992) provide a diachronic overview of vessel form and composition in Kentucky, which is consistent with the generally held sequence throughout most of the Fort Ancient region. They suggest that Fort Ancient vessel technology and form evolved from antecedent Late Woodland industries. In this sequence, early Fort Ancient vessels were primarily rock tempered cordmarked vessels with straight rim/neck areas and no handles. Decoration was rare. Middle Fort Ancient vessels marked a transition to shell-tempering and vessel handles, as well as an increase in both plain (i.e. not cordmarked) and decorated vessels. Late Fort Ancient vessels reflect the onset of the Madisonville tradition, which involved fairly standardized vessels with diagnostic pie-crust rim forms, four handles, and general lack of guilloche patterns seen in earlier periods. Additionally, this period saw an increase in variability in vessel form, including jars, bowls, plates, and pans. It is thought that this shift in vessel form, along with some decorative choices, reflects an increase in extra-regional connections. Although this sequence is commonly held throughout the region, it does not fit well with that of Cowan (1987), who suggested an alternative trajectory in the Miami Valleys (see
above). This may point to regional differences in the evolution of ceramic form and style, an issue which will be revisited later.

**Stone Tools**

The use of stone among Fort Ancient societies focused on pragmatism and utility. In general, the organization of technology focuses on a few formal tool types, such as projectile points, drills, knives and more rarely, scrapers. Expedient tools, such as retouched flakes, were used to perform a number of tasks (Comstock and Cook 2014; Railey 1992). Raw material utilization typically focused on locally available low-to-medium quality cherts (Henderson 2008), although some projectile points were made from higher quality cherts (e.g., Comstock and Cook 2013). In general, most flakes were produced from cobble cherts found locally in streams and rivers. Bipolar reduction was also relatively common. The relative lack of energy put into procuring high-quality cherts from long distances appears to be a common trend in the Late Prehistoric period and is assumed to be related to increased sedentism (e.g., Jeske 1992).

Projectile points are the only temporally diagnostic stone tool among Fort Ancient assemblages. These generally triangular points, also known as Madison points (Justice 1987), are ubiquitous at Fort Ancient sites. The first confident typology of these tools was formulated by Railey (1992) based on Kentucky assemblages. Using projectile point assemblages from five sites, he determined that in general, forms progressed from incurvate side/excurvate base (Type 2, flared base) in the early period, to serrated triangles (Type 3 serrated) in the middle period. Straight side/straight base (Type 5) become population in the middle period and extend throughout the late Fort Ancient period. In the late period, small, excursive sided points (Type 4) and larger concave-based points (Type 6) dominate. In general, this typology has held up to criticism (e.g., Carmean 2009; Cook and Comstock 2014) and has been further augmented by Henderson (2008).

Cook and Comstock (2014) assessed the validity of this well-tested, but regionally-specific typology using a series of well-dated sites in Miami Valleys of southwest Ohio and southeast Indiana. Using metric traits and multivariate analyses, the
authors confirm that Type 2 is most frequently recovered from early sites and that Types 4 and 6 are constrained to late sites. They push the extent of Type 5 through the entire Fort Ancient sequence, essentially suggesting that it is not a temporally sensitive style. There were not enough Type 3 projectile points at the sites in question to test their chronological placement; these may reflect a style specific to northern Kentucky. Results from this work will be used to help interpret projectile points in the present study.

**Models for Fort Ancient Cultural Development**

Four theoretical perspectives are evident in the prehistoric inquiry of the Middle Ohio Valley. Each perspective was heavily influenced by overarching theoretical paradigm of their times, and resulted in general models for the evolution of Fort Ancient cultures of the Middle Ohio Valley. These perspectives are summarized below.

*Early Migrationist*

Like many regions in which formative fieldwork was conducted during the 19th and early 20th Centuries, early explanations of Fort Ancient development were grounded in migration and diffusion. This stance was common throughout North America (Trigger 2006). Working with legacy collections from early excavations and attempting to identify local patterns and broad connections, Griffin (1943) made one of the first compelling cases for a Fort Ancient - Mississippian connection. He posited that "The Fort Ancient Aspect appears to have been strongly influenced by Middle Mississippi, both by actual migration of peoples bearing a 'Mississippi' culture into the southwestern part of the Fort Ancient territory and by diffusion of traits" (Griffin 1943:257). He goes on to suggest that the Ohio River provided an ideal avenue for the movement of people and traits. The origins of people moving into this region are suggested to have been the Central Mississippi Valley and eastern Tennessee (Griffin 1943:259). Included in the list of similarities between these regions are small, triangular projectile points, discoidals (aka chunkey stones), shell agricultural hoes, smoking pipes (from Tennessee in particular), effigy bowls, and diversity of pottery vessel types. Notably, none of these traits (with the potential exception of pipes) appear in preceding Late Woodland period sites in this
region. It is surprising that crushed mussel shell temper does not make this list. Given Griffin's inclusion of this temper as a defining component of Madisonville (i.e. southwest Ohio Fort Ancient) ceramics (1943:133), I would expect this to have been one of his proposed shared characteristics. This omission may be related to the fact that most shell tempered ceramics are constrained to the southwestern portion of the Fort Ancient region. Regardless, Griffin's theories regarding the development of Fort Ancient are an important starting point. This perspective evoked a particularly isolationist response among some subsequent Fort Ancient scholars.

The other often cited example of Mississippian migration into Ohio is Blain Village. Based on excavations at Blain Village in Ross County, Ohio, Prufer and Shane (1970) posited that the site was a result of an influx of Mississippian people. Citing material culture and a village organization focused on a central burial mound and plaza, the authors suggest that it is difficult to explain the appearance of Fort Ancient as a gradual development. The sentiment is nested in the language of culture historians, including a discussion of the "...invasion of southern Ohio by Mississipians, resulting in the physical and/or cultural annihilation of the older Woodland cultures" (Prufer and Shane 1970:258). Despite this language and its implications, the recognition that there is a disconnect between the archaeological record of Late Woodland and Fort Ancient in the area is important to consider. In reality, it does not seem as though Mississipians moved wholesale directly to Blain Village. However, given the shell temper, guilloche patterns, and settlement layout, I would argue that this site, and the nearby Baum village (Mills 1906) may reflect the destination of groups that fissioned from early Fort Ancient/Mississippian communities in southwest Ohio or perhaps from Feurt village (Mills 1917), near the confluence of the Scioto and the Ohio River. Consideration of this process of village fissioning, while key to understanding Neolithic societies elsewhere (e.g., Bandy 2004), is understudied in this region.

Gradualist

The prevailing interpretation of Fort Ancient development in the Middle Ohio Valley is that of gradual change from small settlements to large villages (e.g., Church and
The mechanism underlying this change is evolutionary, suggesting that village life is a result of co-evolutionary processes (*sensu* Rindos 1984) between human societies and the environmental niches which they shaped over time. In this scenario, the gradual incorporation of maize as a staple crop fostered the emergence of agricultural systems, population aggregation, and settlement growth (*Figure 4.3*) (e.g., Henderson et al. 1992).

Pollack et al. (2002) provide a summary of Late Prehistoric dynamics south of the Ohio River. The general trend put forward is that during the early Fort Ancient period (AD 1000-1200), people lived in small communities of 6-10 houses with short occupation spans, with no evidence of burial ritual or extra-regional exchange. In the middle Fort Ancient period (c. AD 1200-1400), aggregation increased, and large circular, plaza-focused communities emerged. These communities were occupied longer and included communal cemeteries and some evidence of social inequality. The late Fort Ancient period (c. AD 1400-1750) includes the development of the Madisonville Horizon, which includes homogenized ceramics, very large villages, and inter-regional interaction with Mississippian groups. The general trend suggested here is that of slow aggregation over centuries, largely in isolation until the 1400's.

Church and Nass (2002), suggest a similar pattern of gradual development in central Ohio. They see the early Fort Ancient (c. AD 1000-1200) as a transitional Late Woodland/Fort Ancient period in which small sites, organized in a linear fashion, were occupied for short periods of time. Many of these sites appear to have either incorporated previous burial mounds or developed their own burial mounds within a village pattern (e.g., O.C. Voss [Brady-Rawlins 2007]). After AD 1200, the authors suggest a new form of settlement organization emerged, which involved large circular communities like SunWatch (Cook 2008), Anderson Village (Essenpreis 1978), and Philo II (Carskadden and Morton 2000), arranged around central plazas. The main argument of this summary is that as maize became a higher ranked resource in the system of Late Woodland and Late Prehistoric societies, settlement and social systems began to reflect community-focused, maize-based adaptations.
In a general sense, these views reflect the processual paradigm that dominated archaeological thought between the mid-1960's and the late-1990's. Gradual evolutionary change based on adaptation to one's local environment is a staple of these approaches (Trigger 2006). Additionally, the relatively closed-system approach evident in Pollack et al. (2002) and others reflects the dismissal of non-local influences and a focus on the culture as an adaptive unit are fundamental to the New Archaeology. This is not to say that these scholars are not careful or are patently wrong, but merely that many interpretations are the products of their times.

**Interactionist**

An alternative approach to strict migrationist or gradualist positions has recently been put forth by Cook (2004, 2008; Cook and Fargher 2008; Cook and Schurr 2009), who in many ways built on the work of Essenpreis (1978). This middle-ground position suggests that while gradual processes may have initiated Fort Ancient development, interaction with and population movement between neighboring Mississippian communities and individuals fostered cultural change. Interaction of this nature is posited to be a periphery peer relationship, in which development among neighboring societies occurs in parallel, and interaction between groups helps shape this relationship (Cook 2008).

Essenpreis (1978) suggested that Fort Ancient is best represented by two phases. The earlier Anderson Phase (c. AD 1000-1400) was thought to reflect the interaction between Mississippian and Late Woodland peoples. The Fort Ancient people, in this sense, were primarily Late Woodland populations who incorporated some Mississippian characteristics into their lifestyles. Much of her argument is a response to Prufer and Shane's (1970) idea that Mississippians came in and wiped out Late Woodland people in Ohio. She suggests that "by defining Late Woodland groups as those that lack obvious Middle Woodland ceremonialism and also lack the Fort Ancient ceramic traits of shell tempering, strap handles, and curvilinear guilloche designs, Ohio archaeologists have established a taxonomic unit which, by definition, cannot develop into Fort Ancient" (Essenpreis 1978:148). This is a sound taxonomic critique that highlights issues with the
Late Woodland period in Ohio (e.g. Burks 2005; Seeman and Dancey 2000). The later Madisonville Phase (post-AD 1400) was seen as a period of population movement and aggregation at a few key sites. Essenpreis differed from many of her contemporaries in that she was comfortable considering the development of a largely localized Fort Ancient culture within the broader context of the Mississippian world.

Cook (2008; see also Cook and Fargher 2008; Cook and Schurr 2009) uses SunWatch, a well-studied middle Fort Ancient site near Dayton, to support the hypothesis that contact with Mississippian groups affected community development. By thoroughly examining assemblages from this well-excavated site, he provides sound archaeological evidence that a small group of Mississippians moved into this village, living alongside local Fort Ancient people. In the first stages of this community, occupation follows a sequence that supports Essenpreis' model; Late Woodland people are living a relatively Mississippian lifestyle. In the later stage of the village, a wall trench structure was constructed in the northern portion of the village that is a locus of shell-tempered ceramic production. In essence, Cook's exploration of SunWatch identified not only a Mississippian-like village, but also provided strong evidence for the movement of a non-local Mississippian family or lineage into the village.

**Neo-migrationist**

An emerging perspective has been driven by the ongoing work of Cook and others (Comstock and Cook 2014, 2016; Comstock et al. 2015; Cook and Price 2015; Cook et al. 2015; Schulenburg and Cook 2016) at the Guard and Turpin sites in the lower Great and Little Miami Valleys, respectively. In spirit this approach builds on the work of Griffin (1943), who identified Mississippian influences in this region, and Cowan (1987), who suggested that Mississippian influence acted as a catalyst (or "kick") for the emergence of Fort Ancient societies. Until recently, this hypothesis went largely untested because of the overwhelmingly isolationist approach of the time and a lack of systematic fieldwork at early sites along the Ohio River.

What I have labeled here as a neo-migrationist approach builds on isotopic (Cook and Price 2015), biodistance (Cook and Aubry 2014), chronological (Cook 2014; Cook...
and Comstock 2015) and archaeological (Comstock and Cook 2014, 2016; Cook et al. 2015; Cook et al. n.d.) studies of communities and people within the Fort Ancient system. These new datasets reveal the importance of migration in the formative stages of Fort Ancient life in the lower Great and Little Miami Valleys. Contrary to expectations of gradual approaches, sites like Guard and Turpin, both of which date between AD 1050-1275 (Cook 2014; Comstock and Cook 2016), appear to be complex communities arranged in circular patterns with houses constructed using wall-trenches. Additionally, Cook and Price (2015) found that up to 30% of people buried in a mound/cemetery complex at Turpin exhibited non-local strontium signatures. Numerous Mississippian artifacts (Ramey ceramic motifs, chunkey stones, anthropomorphic pipes, copper earspools) have been recovered from these sites (Comstock et al. 2015; Cook and Genheimer 2015). Archaeological and biological evidence both point to these early sites near the confluence of major rivers with the Ohio River as entrepôt sites, largely created by Mississippian migrants. It is unclear at present the relationship between these incoming populations and local Late Woodland people. They may have integrated into these new communities or perhaps population density was not significantly high in this region; migrants may have entered into largely uninhabited valleys.

The present study and my own future work in this region will focus on exploring processes of migration and Mississippianization throughout the Great and Little Miami Valleys and tying these processes to broader Neolithic trends. At present, mounting evidence suggests that a neo-migrationist perspective is at least warranted in this small region, and that future work in the Fort Ancient system should include migration or Mississippian contact as a potential hypothesis for cultural change.

*Fort Ancient Models in Perspective*

The perspectives outlined above present alternative models for Fort Ancient cultural evolution in the Middle Ohio Valley. The key contention is whether or not, when, and to what extent Mississippian contact influenced Fort Ancient cultural development. For the last 40 years, processualist isolation has been standard, reflected in statements like Pollack and Henderson’s (2000:215) summary of Fort Ancient: "for all
intents and purposes, the Fort Ancient culture area during these periods can be viewed as a closed system made up of several small regional subsystems each relatively unaffected by events that occurred outside the Fort Ancient culture area." This statement is followed with the assertion that Fort Ancient cultures maintained an egalitarian way of life because they opted not to become Mississippians, and exemplifies the mentality of this approach.

An alternative to the closed-system approach of strict processualists is consideration of Mississippian influence during the Fort Ancient period, or perhaps even as a catalyst for Fort Ancient development, as Cowan (1987) and early Griffin (1943) suggested. In many ways, Fort Ancient villages, particularly those in the Miami Valleys, are very similar to Mississippian villages. Similarities are most explicit early in this sequence (Comstock et al. 2015; Cook et al. 2015). Coupled with recent isotopic data (Cook and Price 2015), it is clear that in villages in some regions, Mississippian contact or actual migrants had an influence on the unique histories of these communities.

One important issue that must be considered is that regional differences in history and environment may have resulted in different trajectories of what we refer to as Fort Ancient. This taxonomic unit tends to be a catch-all for Late Prehistoric agricultural societies in the Middle Ohio Valley and likely masks significant regional variation. The perspectives outlined above are generally regionally-specific. Gradualist interpretations have primarily been made using data from northern Kentucky (Pollack et al. 2002; Pollack and Henderson 2000) and the central Scioto Valley (Church 1987; Church and Nass 2002), while interactionist interpretations used data from the upper Great Miami Valley (Cook 2008; Essenpreis 1978) and neo-migrationist interpretations use data from the lower Great and Little Miami Valleys (Comstock et al. 2015; Cook et al. 2015; Cook et al. n.d.). It must be considered that perceived theoretical divides may be a result of actual cultural differences, resulting from different historical trajectories and adaptations to different environments.

**Summary**

This chapter provides an overview of cultural development in the Eastern Woodlands, focusing specifically on Late Woodland and Late Prehistoric societies. At
local scales the Late Woodland period (c. AD 500-1000) was one of segmentation and complexity. At broader scales it was a period marked by diffusion, particularly of the bow and arrow, and late during this time period (c. AD 900), maize agriculture. In Ohio, I suggest this period is marked by low-level food production, seasonal movement, and reoccupation of key points on the landscape. After the introduction of the bow and arrow (c. AD 700), mobility may have increased, resulting in more ephemeral sites.

Following the Late Woodland period, cultures with distinct Mississippian characteristics became prevalent throughout the valleys and uplands of much of the Midwest and Southeast. These societies are marked by floodplain adaptations linked to maize agriculture, large villages and towns, social inequality, and religious practices. In many ways, Mississippian, if this construct is indeed legitimate, appears to reflect a shared cosmology as much as an adaptive system. Notably, Mississippian polities underwent frequent fission/fusion cycles, resulting in periodic emigration from these chiefly centers. A series of enclaves developed throughout the southeast (e.g., Pauketat 2007) may be related to this dynamic. The results of these historical processes on peripheral societies are just beginning to be explored (e.g., Blitz and Lorenz 2002; Cook 2008; Delaney-Rivera 2004).

Fort Ancient societies, which existed on the northeastern periphery of the Mississippian world, are notable for many of the same adaptations as Mississippians, although they do not exhibit marked social inequality. Fort Ancient people lived in villages, often arranged circularly, sometimes around plazas with central posts (e.g., Cook 2008), and farmed maize on the floodplains and terraces of the Ohio River and its tributaries. Regional chronologies and phases suggest that there may be geographic differences in the expression of Fort Ancient culture, although these remain unexamined systematically. Mississippian influences and/or contact at the inception of Fort Ancient culture are just beginning to be explored, particularly in the lower Miami Valleys.

Specific attention has been paid, when appropriate, to the role that Turpin plays in the culture historic sequence of the Middle Ohio Valley. In Griffin's seminal work, it was a Madisonville Phase village (Griffin 1943) and the type site for Late Woodland Newtown villages (Griffin 1952). The Madisonville Phase was later suggested to be a late
Fort Ancient phenomenon (e.g., Drooker 1997), but Griffin's original delineation was ahistorical. In Cowan's work, Turpin was the type site for early Fort Ancient villages in the Miami Valleys. These villages, he suggested, exhibited ties to Mississippian neighbors. Church and Nass (2002) suggest that it was only late during the Turpin Phase (post AD 1200) that circular villages develop in this area; prior settlements are thought to have been less permanent. Others have suggested that early villages in this region exhibiting Mississippian ties must have heretofore undiscovered late components that explain these extra-local connections (e.g., Pollack et al. 2002). These often conflicting views on the chronological and cultural affiliations evident at Turpin, as well as any potential links between Late Woodland and Fort Ancient cultures which can shed light on this transition, prompted further study into this site.
Chapter 4 Figures

Figure 4.1: Map of known Fort Ancient sites in the Middle Ohio Valley.
Figure 4.2: Fort Ancient Foci from Griffin (1943).
Figure 4.3: Gradual model of village development in the Middle Ohio Valley
Chapter 5: Middle Ohio Valley Climate Change between AD 500-1500

The influence of shifting environmental and climatic conditions on human behavior is important to consider when exploring changes in cultural systems. Archaeologists have long attempted to reconstruct past climates in order to better understand the context within which prehistoric people lived (e.g., Fagan 2001, 2008). Examining changing environmental parameters allows for long-term changes in subsistence, settlement patterns, and inter-regional interaction to be nested within broader ecological trends. The timeframe of the present study (c. AD 500-1500) spans numerous well-documented Late Holocene climate anomalies, including the Roman Climate Optimum (c. AD 1-500) (Bianchi and McCave 1999), the Medieval Climate Anomaly (c. AD 900/1000-1300/1400) (Hughes and Diaz 1994; Lamb 1965; Fagan 2008; Mann 2002; Mann et al. 2009) and the Little Ice Age (AD 1300-1850) (Fagan 2001; Mann 2002). The onsets of these global climate anomalies were relatively rapid, likely influencing how people lived throughout the world. Although evident on a global scale, the effects of these transitions varied geographically. In some areas, for example, the Medieval Climate Anomaly resulted in favorable conditions, population growth and the emergence of social complexity (e.g., Fagan 2008), while in other areas it produced multi-decadal droughts, starvation and population dispersals (e.g., Kohler and Varien 2012). Understanding the interplay between climate change and human action in specific regions is necessary to fully conceptualize particular cultural trajectories.

In the Midwestern United States, Griffin (1961) was one of the first to link amelioratory climatic conditions to the development of Mississippian culture, including sedentary villages, maize agriculture, and social complexity. He also posited a converse relationship during the Little Ice Age, in which shorter growing seasons and drier conditions were hypothesized to have resulted in shifts in cultural organization. Although
Griffin did not imply a deterministic linkage between climate change and culture change in the Midcontinent, he noted several compelling correlations. More recent work has sought to explore the links between climate change and culture change in the greater Midwest, although this work is inordinately focused on the development and collapse of chiefdoms (e.g., Benson et al. 2007; Benson et al. 2009). In the Middle Ohio Valley, peripheral to the development of chiefdoms in the Mississippi Valley, a recent paper by Nolan and Cook (2010) used a human behavioral ecology approach to examine potential human responses to changing climate in a small time period. Beyond this, the region has seen comparatively little modern attention. Rarer still are studies that seek to examine interregional connections as they relate to changes in the climate system.

In this chapter, available proxy data for climatic and environmental change in the Midcontinent are reviewed and basic trends in these data for the period between AD 500 and AD 1500 are identified. Few high-resolution datasets are available in the immediate Middle Ohio Valley region at this time, so local sources are limited to the reconstructed drought atlases, which rely on the Palmer Drought Severity Index (PDSI) (Cook et al. 2004; Cook et al. 2010). Using PDSI-based models, two scales of analysis are used to explore environmental trends in the midcontinent. First, century-level trends will be examined between AD 500 and AD 1500 to determine if changing conditions are evident. Second, if results are promising, the resolution of the analysis will be increased to 25-year time slices, which approximates a generation. Findings at this level will help to understand whether or not relatively rapid environmental change occurred. Additional datasets beyond this immediate geographic region are also explored in order to create a generalized overview of late Holocene climate trends in interior eastern North America. If these datasets, including speleothem and isotopic examination of faunal remains, support the general trends noted in the PDSI reconstructions, it will lend credence to these models and the general trends derived from them.

This section purposefully approaches the paleoclimate record of the study region inductively, with the goal of identifying patterns and avoiding issues of environmental determinism and circularity, persistent problems in archaeological approaches to paleoclimate (e.g., Coombes and Barber 2005). Environmental determinism is considered
as the causal link between changes in environmental variables and cultural responses, and
has long been a thread of discourse in the social sciences. Coombes and Barber (2005)
identify a movement toward ‘soft’ environmental determinism, a stance that
acknowledges the link between environment and culture, and concedes that the
environment sets parameters on human action, but does not create causal links between
them. The proposed outlook is thus not particularly deterministic; authors who tend
toward this approach consider the environment to be one of many influences on cultural
systems, and that models of cultural development must account for such multifaceted
influences. This approach fits well with macroevolutionary theory, a theoretical approach
which views the environment as one possible catalyst of punctuated change.

**Palmer Drought Severity Index and Background of the Problem**

The Palmer Drought Severity Index (PDSI), which forms the foundation of
analyses in this section, is a proxy for past moisture conditions derived from tree ring
data. The PDSI is a modeled reconstruction of past soil moisture created using annual-
resolution tree ring data. By correlating historic moisture data with tree rings from the
same era, a measure of past soil moisture can be extrapolated based on tree ring records
which extend into the past. The method used to do this is a point-by-point regression
procedure outlined in Cook et al. (1999). In North America, two generations of
paleoclimate reconstructions based on the PDSI are available. First, the North American
Drought Atlas (NADA) uses reconstructed PDSI data to interpolate a continental climate
model in a 2.5x2.5 degree grid comprised of 286 points based on 835 tree ring
chronologies (Cook et al. 2004). Second, the Living Blended Drought Atlas (LBDA)
utilizes an updated database of tree ring data to create a higher resolution continental map
at a 0.5x0.5 degree resolution of 11,396 grid points based on 1,845 tree ring chronologies
(Cook et al. 2010). Data from each of these atlases will be used to present patterning in
wet/dry cycles in the Eastern Woodlands. The LBDA will be used to explore regional
trends between AD 500-1500 at both century and 25-year increments. The NADA will be
used to examine trends in southwest Ohio during this time period using the closest data
point to the region of interest. Together, these datasets help characterize both regional
and local moisture conditions and help to paint a broader picture of the ecological thresholds that influenced prehistoric people in this region.

The NADA and LBDA have been used to identify past droughts and times of abundance, and have been successfully used as an interpretive tool in archaeological contexts (Benson et al. 2007; Benson et al. 2009; Cook et al 2004; Cook and Nolan 2010). These data provide useful proxies for drought/wetness, especially in the arid American Southwest, in which long histories of drought have been recorded (Cook et al. 2004). Coupled with a high archaeological resolution thanks to dendrochronology, the effects of climate change on human societies in this region have been examined over centuries (e.g., Kohler and Varien 2012). In the more temperate Midwest and Northeastern regions, this proxy is less frequently used since there are fewer dendrochronological samples available. However, modeled NADA and LBDA data provide a method of examining trends within this region. Coupling them with independent lines of supporting evidence is the best way to confidently identify patterns in past climate systems.

One application of this approach in the Midwest uses NADA data to model Ohio Valley climate between AD 800-1400 within the framework of evolutionary ecology, relying heavily on the Winterhalder-Kelly (W-K) model (Nolan and Cook 2010). PDSI data were used to create 50-year averages in terms of moisture and variability. General findings suggest that between AD 800-900, conditions were very dry across the region, a trend which continued to a lesser extent between AD 900-1000. At approximately AD 1000, conditions improve to the extent that there is no moisture shortage. This lasted until approximately AD 1100, after which moisture shortages are identified in the west (Illinois/ Missouri), although the Middle Ohio Valley remained relatively wet. For most of the AD 1100-1200 periods, conditions remained relatively wet, although after about AD 1300, drought (probably associated with the Little Ice Age), begins to become prevalent in the region. For each time period, the authors posit potential cultural responses based on W-K model expectations. However, despite a suggestion that these responses fit well with regional data, some responses (e.g., the development of agriculture and social complexity between AD 900-1000) seem a century or more off.
Although coarse, findings from Nolan and Cook (2010) are similar to the general overview provided below for PDSI data in the Midcontinent. However, an issue arises when the theoretical framework used to create inferences from these data is considered. Findings are contentious to some extent because of the nature of the data (e.g., Benson et al. 2010) and the general utility of optimal foraging theory models in archaeology (e.g., Smith 2015). The use of W-K model is problematic for predicting human behavior, largely because of their ahistorical nature (Smith 2015). In response to Nolan and Cook, Benson et al. (2010:985) point out that “…to warrant the applicability of the Winterhalder-Kelly model, Nolan and Cook make certain essentialist assumptions about human behavior and social organizations.” Nolan and Cook (2010:68) note that a strength of the W-K models is their divorce from history. However, such models do not take into account the multifaceted nature of the relationship between environmental change and cultural systems. History is one such facet; the accumulated knowledge and traditions inform heavily on decision-making. The fundamental issue with this approach is that, in the case of Nolan and Cook, it is assuming that decisions regarding subsistence, settlement, and contact between groups are being made based on soil moisture.

The present study seeks to avoid similar issues by identifying patterns inductively and then using these patterns as one line of evidence for interpreting local and regional archaeological data. As suggested by multiscalar frameworks for social evolution and cultural change (e.g., Zeder 2009), shifts in the ecological parameters within which people acted are an important facet of macroevolutionary change. The following examination of environmental context of will be structured around identifying general trends at the scale of the Midwest followed by specific examination of patterns in Southwest Ohio. After patterns have been identified at each scale, two independent lines of paleoclimatological evidence from the region will be cited to support these trends. Although such paleoclimate proxies are rare in this area, isotopic analyses of fish otoliths and speleothems provide independent but supporting glimpses into past environmental conditions.
Regional Trends

The study area selected to examine regional trends in moisture availability is located between 35°N and 45°N latitude and 80°W-100°W longitude, which includes Ohio, Indiana, Illinois, Kentucky, Iowa, Missouri, and parts of surrounding states (Figure 5.1). This was selected in order to capture trends in the Ohio River Valley, the middle Mississippi Valley, and surrounding regions. This study region works well in terms of the availability of LBDA data between approximately AD 1000-1500, but suffers from limitations between AD 500 and AD 1000. For this reason, the AD 500-1000 time-slices are limited to Ohio and parts of the surrounding states.

Patterning in regional moisture data is explored first at the century level between AD 500 and AD 1500 in order to examine temporally course but persistent trends. Resolution is then increased to 25-years for the period between AD 1000-1300, which approximately generation-length spans, to examine patterns at a level that would have influenced the lives of individual people and communities during the early Mississippian period. For each time-slice, annual LBDA data were averaged for each grid point. These were then imported into ArcGIS 10.2 for spatial analysis. Coverages were interpolated using the Inverse Distance Weighting (IDW) option in the Spatial Analyst extension of ArcMap. Findings were mapped using standard PDSI categories (see Table 5.1). A brief summary of general trends will conclude this section.

Patterns Identified at Century Scales

In order to concisely discuss century-level trends, a modeled overview of each century between AD 500 and AD 1500 time period is presented for the Central Mississippi, Lower Ohio, and Middle Ohio Valleys when possible. Data are not available for Central Mississippi and Lower Ohio Valleys between AD 500 and AD 1000, leaving only the Middle Ohio Valley as a window into patterns during this period. The entire study region is available for the period between AD 1000 and AD 1500.

The summary of basic trends in moisture availability between AD 500 and AD 1500 across the study area suggest that there is a difference in climate regimes between the Central Mississippi and Lower Ohio Valley region and that of the Middle Ohio
Valley region. Moisture availability during the centuries between AD 500 and AD 1000 remained notably consistent (Figure 5.2). Although some droughts were evident in the northern and southern portions of the study area between AD 800 and AD 1000, moisture conditions along the main trunk of the Ohio River remained consistently similar to modern conditions. During the AD 1000-1100 time period the study area is almost consistently at or above contemporary moisture levels (Figure 5.3). Beginning around AD 1100 and continuing through the remainder of the study period, the majority of the region experienced drought conditions. The exception to this pattern continues to be the Middle Ohio Valley, which does not experience these extensive droughts until after AD 1500.

These general trends provide an informative overview of moisture availability during the 1000 year span between AD 500 and AD 1500. Of particular note are three patterns. First, during the Late Woodland period, moisture remains consistent at the century scale. Any droughts were not persistent enough to effect findings at this scale. Second, the period between AD 1000 and AD 1100 is notable for its increased moisture availability throughout the study region. This period is the wettest in the span studied here. Third, after AD 1100, most of the region is marked by droughts that extend through at least AD 1500. These trends, particularly the periods of marked moisture availability and subsequent droughts, demand an increased resolution to parse important peaks and troughs in the climate of this region.

Patterns Identified at 25-year Scales

AD 1050-1099

Between AD 1050 and AD 1074, most of the study region experienced relatively wet conditions after approximately 50 years of minor droughts (Figure 5.4). PDSI values range between -2.24 (moderate drought) and 1.37 (slightly wet). However, most of the study area ranges between -0.30 (comparable to normal) and 1.37 (slightly wet). Considered spatially, this is one of the most consistently wet periods examined in the present study. To note, the Middle Ohio Valley, particularly between the Falls of the Ohio (near the Prather Site) and southwest Ohio, experienced wetter than normal
conditions. Emerging Mississippian polities like Cahokia, Wickliffe, Kincaid, and Angel experienced conditions comparable to modern moisture levels.

In the period between AD 1075 and AD 1099, drought affected the northern and western portions of the study region, while relatively wet conditions were experienced in the Middle Mississippi Valley and the Lower Ohio Valley (Figure 5.5). PDSI values range from -2.40 (moderate drought) to 1.21 (slightly wet). Although much of the northern Great Plains experienced drought conditions, the central part of the continent was comparatively amelioratory. Particularly, the confluence area of the Ohio River and the Mississippi River, including the centers of Wickliffe and Kincaid, experienced wetter than normal conditions. The area around Cahokia experienced wet conditions as well. The lower Ohio Valley experienced similarly wet conditions, which include the centers at Angel and Prather. During this period, conditions in the Middle Ohio Valley were comparable to modern moisture levels. This period is consistent with the Lohmann Phase of the American Bottom, which saw marked social reorganization and the construction of large-scale public works.

AD 1100-1199

Between AD 1100 and AD 1124, most of the study region experienced drought conditions (Figure 5.6). PDSI values range between -1.25 (mild drought) and 1.59 (slightly wet); the ubiquity of drought and locations of particularly dry conditions are notable. Much of the Great Plains experienced drought at this time, as did portions of the central Mississippi Valley. In particular, the Mississippian center at Cahokia experienced some of the driest conditions during this time period. Wickliffe, Kincaid, and Angel also experienced droughts, but to lesser degrees. Notably, the Middle Ohio Valley is the only area in the study region to experience conditions at or wetter than modern averages. As one moved up the Ohio River, conditions gradually became wetter. The theme of dry conditions in the Central Mississippi and the Lower Ohio Valleys and relatively wet conditions in the Middle Ohio Valley continues throughout the next century.

The previously identified drought extends into the AD 1125-1149 time period (Figure 5.7). PDSI values range from -3.12 (severe drought) to 0.39 (incipient wet spell);
this range is considerably larger and skewed toward negative values than any prior period. However, the most intense droughts occurred in the northern portion of the study region (modern Michigan) and may relate to Great Lakes micro-climates. Many populations throughout the Great Plains and Eastern Woodlands still experienced moderate droughts. Mississippian centers at Cahokia Wickliffe, Kincaid, and Angel experienced droughts that extended from the previous period and became more severe. Many of these centers would have experienced approximately 50 years of primarily drought conditions on average. The only portion of the study area that continued to experience conditions at or above modern values was the Middle Ohio Valley. Beginning at approximate the Falls of the Ohio and extending up the Ohio Valley, conditions were generally comparable to modern moisture values.

Between AD 1150 and AD 1174, droughts continued across most of the study region (Figure 5.8). PDSI values range from -3.07 (severe drought) to 1.05 (slightly wet). The driest conditions were experienced in the northwest portion of the study area, in modern day Nebraska and South Dakota. The only wet conditions were around Lake Erie and in the deep southwest of the study region. Most of the Lower Ohio Valley experienced drought, while the Middle Ohio Valley continued to experience average conditions. Mississippian centers at Cahokia, Wickliffe, Kincaid, and Angel continued to experience dry conditions. Although on average these droughts were not severe, they were consistent and extended on the order of 75 years of relatively dry conditions.

In the period between AD 1175 and AD 1199, the majority of the region continued to experience drought conditions (Figure 5.9). PDSI values range between -3.38 (severe drought) and 1.08 (slightly wet), which is consistent with the previous 25 years. The only areas that did not experience droughts through this period were the Middle and Upper Ohio Valleys, extending from just east of the Falls of the Ohio (near the Prather Site) through Ohio, West Virginia, and Pennsylvania. To note, Cahokia, Wickliffe, and Kincaid continued to experience moderate to severe droughts, extending the drought period in the central valley and the confluence area to approximately 100 years of on average drought conditions.
**AD 1200-1250**

Between AD 1200 and AD 1224, the severity of drought lessened throughout the study area, although much of the region still experienced drought conditions (Figure 5.10). PDSI values range from -1.51 (mild drought) to 1.62 (slightly wet). Most of the wettest values in the region are in the southwest of the study area and are largely inconsequential to the present study; the majority of this area still experienced slight droughts. The most notable area of drought was experienced in the central Mississippi Valley, the Lower Ohio Valley, and the Wabash River Valley. This area includes Cahokia, Wickliffe, Kincaid, and Angel. The Middle Ohio Valley experienced, on average, incipient dry spells during this period.

During the time period between AD 1225 and AD 1249, extensive droughts covered the northwest portion of the study region and moderate droughts affected much of the rest of the area (Figure 5.11). PDSI values range between -4.48 (extreme drought) and 0.5 (wet spell). The central Mississippi Valley and the Lower Ohio Valley continued to experience drought, although of a less severe nature. Most of the Middle Ohio Valley experienced slight drought to slightly wet conditions.

**AD 1250-1299**

The period between AD 1250 and AD 1274 reflects the end of a period of drought conditions that lasted almost 150 years across much of the Midcontinent (Figure 5.12). PDSI values range from between -0.91 to 1.09; this small range suggests that much of the region experienced relatively similar conditions during this period. Areas that experienced the wettest conditions tend to be in the Middle Ohio Valley, near the Falls of the Ohio, and the Lower Ohio Valley. The Central Mississippi Valley near Cahokia again experienced wet conditions not seen since the end of the 11th Century. The confluence area of the Mississippi and Ohio Rivers experienced slight drought. The driest areas tend to be modern Michigan and the southeast part of the study region, including parts of Virginia, Tennessee, and North Carolina. This pattern may be linked to the return of the climate pattern seen in the 11th Century.
Between AD 1275 and AD 1299, much of the region is split between drought and relative wetness (Figure 5.13). PDSI values range between -1.44 and 0.60; the droughts that return in this period are less severe than those of the previous centuries. The driest areas in the region during this period are in Michigan and northeast Ohio, and in the Central Mississippi Valley. Mississippian centers like Wickliffe and Kincaid experienced the most severe droughts; Cahokia and Angel experiences less severe droughts. The Middle Ohio Valley, along with parts of West Virginia and eastern Kentucky, experienced the wettest conditions in the study area during this time period.

Summary

Two general patterns are evident in the time span between AD 1000 and AD 1300 (Figure 5.14). First, the effects of global climate shifts manifested in the American Midcontinent, although they were geographically variable. The Medieval Climate Anomaly appears to have begun by approximately AD 1100. It resulted in different conditions throughout the region. In the Central Mississippi Valley and the Lower Ohio Valley, this began a period of centuries-long drought on average. In the Middle Ohio Valley a converse trend is evident. While much of the region experienced droughts, this small area continued to experience wet conditions. For much of this period, the Middle Ohio Valley is the wettest in the study region.

The Little Ice Age was also a driving factor in the study area, beginning at approximately AD 1300 and lasting through the end of the 1000 year period in question, at AD 1500. Examinations of data not in the timeframe of this study suggest these conditions persisted through the beginning of the 20th Century. During the Little Ice Age, moisture data suggest that much of the area was drier than average. For much of the Midcontinent, this meant the persistence and deepening of droughts experienced during the Medieval Climate Anomaly. In the Middle Ohio Valley conditions regressed from consistently wet to persistent droughts much like the rest of the study region.

Second, conditions in the areas of interest to this study provide some insight into cultural patterns in the region. The Mississippian heartland experienced fluctuating conditions, particularly between AD 1000 and AD 1300. Benson et al. (2007, 2009) have
noted the relationship between these droughts and the solidification of Cahokian authority in the Stirling Phase (AD 1100-1200) and also with the reorganization of decline of this polity in the Moorehead Phase (AD 1200-1275). The Fort Ancient heartland followed a different trajectory. Early villages in this region were established during an ameliorative environmental period. It appears as though early Fort Ancient villages were founded during a time that saw the rise of Mississippian polities at Cahokia, Wickliffe, Kincaid, and Angel, and also a window of wet conditions. While social inequality increased in the central Mississippi Valley, villages in the Middle Ohio Valley remained relatively egalitarian.

Local Trends

At this point, I have explored paleoclimate trends on a regional scale, suggesting that spatial and temporal variability in moisture availability existed throughout this region as a result of shifting climate conditions. In order to explore detailed trends in a specific location, the NADA data point closest to southwest Ohio is used (#236). For this location, moisture data are presented between AD 500 and AD 1500. Annual data are presented with a 5-year running average. Additionally, averaged 5-year data are presented for a more interpretable dataset. Using these averaged data, thresholds and trends are identified. Thresholds are defined as periods in which distinct changes in moisture availability occurred rapidly. These periods and are identified visually using the slopes of data for each period. Frequency data for each PDSI category are then used to examine trends before and after these thresholds. Examination of the extreme ends of the spectrum also provides useful insight. In this examination, the goal is to provide detailed understanding of environmental change, to identify potential thresholds, and to characterize the nature of the periods of relative stasis between thresholds.

In order to characterize the nature of environmental change in southwest Ohio, a data point near present day Dayton (number 127) was used. Examination of yearly (Figure 5.15) and 5-year average (Figure 5.16) data series highlights three trends in terms of relative moisture. First, the period between AD 625-1025 is notably and consistently drier than any other era in this range. Although there is also considerable
variability, the period is well below average moisture levels. Particularly notable are the period between AD 625 and AD 725, which was almost entirely in drought, and the period between about AD 800 and AD 1000, which cycled between drought and normal conditions at the rate of about every 25 years. Second, the period between AD 1025 and AD 1275 was one of relative wetness. During this period, available moisture was variable, but most years were at or above modern levels. This period stands in contrast to the prior four centuries, and corresponds with the Medieval Warm period. Third, after AD 1300, conditions got considerably drier. They remain dry until at least AD 1500, which is the end of this analytical period. This dry period corresponds with the Little Ice Age. These data are largely consistent with the regional trends noted above.

Three time periods between AD 500 and AD 1500 have been qualitatively identified as significant environmental periods. The transitions between these periods are equally as important. The first, period between AD 975 and AD 1025, marks a transition from drought to wetter conditions and occurs within about 50 years (Figure 5.17). Notably, this is the time period in which the transition from Late Woodland to Fort Ancient is thought to have occurred. The second transitional period occurred between AD 1335 and AD 1350 and marks a return to drier and more variable conditions (Figure 5.18). This shift, while not as dramatic as the first, took place over a shorter time span and generally corresponds with changes associated with the Madisonville Horizon in the Middle Ohio Valley (c. AD 1400).

When examining the number of years categorized as each PDSI category (Table 5.1), the difference between these time periods is distinct. Specifically, between AD 500-1025, the majority of days were dry (n=284; 53.8%), while the rest were either wet (n=133; 25.2%) or normal (n=109) (Figure 5.19). Between AD 1025 and AD 1275 the pattern changed. Years were split relatively evenly between wet (n=98; 39.2%), dry (n=60; 36.8%), and normal (n=92; 24.0%). While these data are telling, it is perhaps more informative to examine the relatively proportions of extremely wet or dry years during these time periods. Between AD 500 and AD 1025, 109 years (20.8%) are classified as moderately to extremely dry, while 28 years (5.3%) are classified as moderately to extremely wet (Figure 5.20). Again between AD 1025 and AD 1275, the
pattern shifts. During this time period, 27 years (10.8%) are classified as moderate to extremely wet, while 22 years (8.8%) are classified as moderate to extremely dry.

Examining patterns in available moisture in southwest Ohio between AD 500 and AD 1500 has produced two notable trends. First, three different climatic periods are evident in these data that bracket the period of interest. Between roughly AD 625 and 1025, dry conditions dominated the area. After AD 1025, a period of relatively moist conditions consistent with the Medieval Warm Period is evident until approximately AD 1300. After this point, conditions become more variable and drier, consistent with the Little Ice Age. In essence, the Middle Ohio Valley appears to have been influenced by broader climate trends that affected many areas of the world. Second, two periods of transition are evident, one between AD 975-1025 and the second between AD 1335-1350. Each of these transitions occurred over the course of one or two generations. With these findings in mind, the periods identified here can be considered as periods of stasis bracketed by potential environmental thresholds.

**Paleoclimate Proxies**

An important question when dealing with paleoclimate proxies is whether or not perceived trends are evident in independent datasets. Using NADA and LBDA data, I have suggested that in the American Midwest (and particularly Ohio), the effects of global environmental transitions such as the Medieval Climate Anomaly and the Little Ice Age were considerable. Although paleoclimate data in this region are sparse, especially for the period of interest, two proxies are available. Speleothem data from West Virginia and zooarchaeological data from Tennessee provide independent lines of evidence and should help corroborate the general patterns identified above.

**Speleothems**

In karstic regions of the world, speleothems are increasingly turned to for high-resolution climate data (McDermott 2004). Because they grow incrementally in part as a result of percolated precipitation, stalactites and stalagmites reflect $\delta^{18}O$ levels from the environment. These levels provide information regarding the relative temperature and
precipitation rates during the past. At times, resolution can approach sub-annual level, although this is dependent on the rate of percolation in a karstic system, often resulting in decadal or coarser resolution. In some areas, archaeologists have begun to use high-resolution climate data derived from speleothems to provide climate patterning against which cultural patterning can be interpreted (e.g., Kennett et al. 2012).

In the American Midwest, there are very few speleothem studies which span the Late Holocene period. The only one in close proximity to the Middle Ohio Valley is from Buckeye Creek Cave in south central West Virginia (Springer et al. 2008). The stalactite used in this study grew between 7000 B.P. and present, with an average resolution of 34.7 years. In the time period in this study (AD 500-1500), the average resolution is approximately 55 years. Because of this low resolution, I expanded the range from AD 1 - 1500 in order to better highlight diachronic trends. These data highlight four trends (Figure 5.21). First, relatively warm and wet conditions consistent with the Roman Climate Optimum are evident, ending at approximately AD 575, although it was preceded by approximately 150 years of cooler, drier temperatures. Second, the following three hundred and fifty years (c. AD 575-1025) are marked by a trend of cooler, drier conditions. Third, from approximately AD 1025 until AD 1350, warmer, wetter conditions are evident. This is consistent with expectations for the Medieval Climate Anomaly. Finally, beginning around AD 1400, conditions were cooler and drier, a period lasting until the mid 1700's and generally consistent with the Little Ice Age. These periods are consistent with the LBDA and NADA patterns identified above.

Faunal Remains

Fish otoliths represent a useful paleoclimate proxy for riverine environments, although analyses are often cost prohibitive and require excellent preservation. These aragonitic structures grow accretionally, and provide a resolution of yearly banding (Wurster and Patterson 2001). Because they grow relative to the conditions of the river in which fish live, otoliths provide a record of past environmental conditions, which can be examined by analyzing the \( \delta^{18}O \) values of carbonate in these structures. Wurster and Patterson (2001) present an analysis of 24 samples from a stratified rockshelter in Eastern
Tennessee which spans the Late Holocene period. Overall, the authors suggest that the Holocene, typically characterized as a relatively stable climate period, was notably variable. Five of these samples provide insight into the period between AD 500 and AD 1500. Three patterns are evident in these data. The Late Woodland period (c. AD 500-1000) was cooler than preceding or subsequent centuries. Between AD 800 and AD 1000 temperatures increased. After AD 1000 warmer temperatures were coupled with increased precipitation. This coincides with the frequently cited Medieval Climate Anomaly. The resolution of the period between AD 1000-1300 is low (two samples), but the authors note that temperatures decline markedly after this period, signaling the onset of the Little Ice Age. The authors also note that "warm conditions did not continue through the Mississippian Cultural Period" (Wurster and Patterson 2001:95), addressing an intuitive assumption, namely that Mississippian societies persisted as a result of favorable climate conditions. These periods are consistent with the LBDA and NADA patterns identified above.

Do Proxies Support PDSI Data?

I have presented two available paleoenvironmental proxies to explore the question of whether or not the patterns identified using NADA and LBDA data are supported by independent lines of evidence. Analysis of speleothem data from West Virginia (Springer et al. 2008) between AD 1 and AD 1500 suggests that the same general trends are evident. Examining fish otoliths (Wurster and Patterson 2001) provides another supporting line of evidence. Although the sample size is small, isotopic analysis of these remains demonstrates the same general patterns through the Late Woodland, early Fort Ancient and middle Fort Ancient periods. These are two of the few proxies available in this region for the time period in question, but they each support the PDSI data. This suggests that the general and specific trends noted above in both NADA and LBDA are viable. In this sense, the paleoenvironmental patterns identified above can be used as a line of evidence in interpreting cultural patterns outlined in preceding chapters.
Conclusions

This chapter presented a paleoenvironmental analysis of the Midcontinent between AD 500 and AD 1500. Using the Palmer Drought Severity Index, two trends have been identified that are relevant to the study of cultural patterns in this region. This analysis was approached both extensively and intensively. First, I examined trends across the Midcontinent at century and 25-year time scales. This provided an understanding of past climate in both the Middle Ohio Valley and greater Midwest, including Mississippian centers in the Lower Ohio and Central Mississippi Valleys. Second, I examined data from a single point in southwest Ohio to characterize diachronic climate trends in a small location. This allowed for the identification of potential environmental thresholds in this area. After this study, I examined two additional paleoenvironmental proxies in order to justify the use of drought data in this region. Patterns from both speleothems and fish otoliths mirror those identified in the PDSI data, supporting the validity of the identified trends.

The primary finding in this chapter is the presence of spatial variation in environmental conditions evident across the Midwest and how these shifted over time. Building on the findings of Benson et al. (2007; Benson et al. 2009) that were specific to Cahokia, I expanded the scale of analysis to see how these conditions may have influenced groups on the Mississippian periphery. A time-slice approach was used to see how conditions changed over time at a 25-year interval. Findings suggest that between approximately AD 1000 and AD 1100, most of the region experienced relatively wet conditions. During this period, many Mississippian polities, including Cahokia, Kincaid, Wickliffe, and Angel, were founded. Additionally, early Fort Ancient communities in Southwest Ohio were established. After about AD 1100, most of the Central Mississippi and Lower Ohio River Valleys experienced drought conditions that persisted through AD 1400; some droughts were severe (Benson et al. 2009). The Middle Ohio Valley, however, continued to experience relatively wet conditions, and stood in stark contrast to downriver areas. The disparity of conditions in these regions may have created push and pull factors (in the sense of Anthony [1990]) influencing the movement of people. This possibility will be discussed in Chapter 10.
Another key finding came from examining moisture availability in southwest Ohio in greater detail. The prior spatiotemporal examination identified the Middle Ohio Valley as a place of relatively moist conditions throughout the AD 1000-1300 time period. A deeper look at these trends highlighted two periods of stability and two periods of rapid change. First, the Late Woodland period (c. AD 500-1000) was consistently drier than preceding or subsequent periods. Following this, the early Late Prehistoric period (c. AD 1050-1300) was a period of consistently wetter conditions. Between these periods of relative stasis, a rapid transition occurred; conditions got notably wetter over the course of approximately 50 years. This may reflect an environmental threshold that resulted in increased opportunities for the inhabitants of this region.

After AD 1300/1350, a period of rapid transition occurred in which conditions got drier over approximately 20 years. Notably, this period corresponds with the end of occupation of early Fort Ancient sites such as Guard, Turpin, and State Line, and the emergence of the so-called Madisonville Horizon around AD 1400. During this period, many Fort Ancient sites were depopulated and populations coalesced in a few large villages near the Ohio River (Drooker 1997). Griffin (1961) was the first to note that the conditions of the Little Ice Age may have catalyzed this shift. In this sense, the transition to Little Ice Age conditions may reflect and environmental threshold, forcing people to adapt to cooler, drier environments.

Considerations of macroevolutionary change require an understanding of how shifting environmental conditions may have influenced societies. This chapter has provided a broad understanding of the environmental backdrop against which cultural change unfolded in the Midcontinent between AD 500 and AD 1500. Examination of paleoclimatic conditions resulted in patterns which correspond well with cultural changes evident in the archaeological record of this region. Results point to two periods of relative stasis. The Late Woodland period was consistently dry throughout the study region. The early Late Prehistoric was consistently dry in the Mississippian region (with the exception of AD 1000-1100) and consistently wet in the Middle Ohio Valley. Between these periods, there were relatively rapid changes in environmental conditions, which may reflect the thresholds which catalyzed cultural adaptation and change.
Figure 5.1: Study area and key sites
Figure 5.2: Century-level PDSI patterns in the Middle Ohio Valley between AD 500-1000
Figure 5.3: Century-level PDSI patterns in the Midcontinent between AD 1000-1500 by century
Figure 5.4: PDSI Values in the study region - AD 1050-1074

Figure 5.5: PDSI Values in the study region - AD 1075-1099
Figure 5.6: PDSI Values in the study region - AD 1100-1124

Figure 5.7: PDSI Values in the study region - AD 1125-1149
Figure 5.8: PDSI Values in the study region - AD 1150-1174

Figure 5.9: PDSI Values in the study region - AD 1175-1199
Figure 5.10: PDSI Values in the study region - AD 1200-1224

Figure 5.11: PDSI Values in the study region - AD 1225-1249
Figure 5.12: PDSI Values in the study region - AD 1250-1274

Figure 5.13: PDSI Values in the study region - AD 1275-1299
Figure 5.14: Moisture availability at key sites between AD 1000 and 1300.

Figure 5.15: Annual PDSI Data from Grid Point 236 (Ohio) with 10-year Running Average (red)

Figure 5.16: Annual PDSI Data from Grid Point 236 (Ohio), 5-year average data with 5-year running average
Figure 5.17: Regression of PDSI value and year between AD 975 and AD 1025.

Figure 5.18: Regression of PDSI value and year between AD 1335 and AD 1350.
Figure 5.19: Percent of years that were wet, normal, or dry for southwest Ohio between AD 500 and AD 1275.

Figure 5.20 Percent of years that were moderate to extremely wet or moderate to extremely dry in southwest Ohio between AD 500 and AD 1275.
Figure 5.21: Buckeye Creek Cave (WV) Speleothem $\delta^{18}$O between AD 1-1500. Data from Springer et al. (2008).
<table>
<thead>
<tr>
<th>Value</th>
<th>Condition</th>
<th>Period AD 500-1025</th>
<th>Period: AD 1025-1275</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0 or more</td>
<td>extremely wet (0)</td>
<td>2 (.4%)</td>
<td>1 (.4%)</td>
</tr>
<tr>
<td>3.0 to 3.99</td>
<td>very wet (1)</td>
<td>6 (1.1%)</td>
<td>4 (1.6%)</td>
</tr>
<tr>
<td>2.0 to 2.99</td>
<td>moderately wet (2)</td>
<td>20 (3.8%)</td>
<td>22 (8.8%)</td>
</tr>
<tr>
<td>1.0 to 1.99</td>
<td>slightly wet (3)</td>
<td>49 (9.3%)</td>
<td>37 (14.8%)</td>
</tr>
<tr>
<td>0.5 to 0.99</td>
<td>incipient wet spell (4)</td>
<td>56 (10.6%)</td>
<td>34 (13.6%)</td>
</tr>
<tr>
<td>0.49 to -0.49</td>
<td>near normal (5)</td>
<td>109 (20.7%)</td>
<td>60 (24%)</td>
</tr>
<tr>
<td>-0.5 to -0.99</td>
<td>incipient dry spell (6)</td>
<td>72 (13.2%)</td>
<td>27 (10.8%)</td>
</tr>
<tr>
<td>-1.0 to -1.99</td>
<td>mild drought (7)</td>
<td>103 (19.6%)</td>
<td>43 (17.2%)</td>
</tr>
<tr>
<td>-2.0 to -2.99</td>
<td>moderate drought (8)</td>
<td>82 (15.6%)</td>
<td>17 (6.8%)</td>
</tr>
<tr>
<td>-3.0 to -3.99</td>
<td>severe drought (9)</td>
<td>25 (4.8%)</td>
<td>5 (2.0%)</td>
</tr>
<tr>
<td>-4.0 or less</td>
<td>extreme drought (10)</td>
<td>2 (.4%)</td>
<td>0 (0.0%)</td>
</tr>
</tbody>
</table>

Table 5.1: Percentage of PDSI values per category for southwest Ohio between AD 500 and AD 1275.
Individual sites must be thoroughly understood in order to begin addressing the problems outlined in the previous chapters at multiple scales. Honing understanding of Turpin, the type-site for the Late Woodland Newton Focus (Griffin 1952; Seeman and Dancey 2000) and a Madisonville Focus Fort Ancient village with evidence of Mississippian connections (Drooker 1997; Griffin 1943), will help clarify the nature of the early Fort Ancient communities and their connection (if any) with preceding Late Woodland societies. This chapter serves as an overview of previous excavations and resulting interpretations of Turpin, many of which have become entrenched in the literature with minimal reassessment. Following this summary, new interpretations and questions gleaned from archival and site structure research on the Late Woodland and Fort Ancient components will be presented.

Turpin is an archaeological site on the National Register of Historic Places (#74001514) and is widely recognized as an important Late Woodland and Fort Ancient settlement (Cook 2008; Drooker 1997; Griffin 1943; Oehler 1973; Seeman and Dancey 2000; Starr 1960). The site is located on the second terrace above the Little Miami River near its confluence with the Ohio River, east of Cincinnati, Ohio (Figure 6.1). Previous projects have generated a popular understanding of the site in which it is held that Turpin represents a Late Woodland (Newtown Focus) village stratigraphically overlain by a Fort Ancient village (Drooker 1997; Griffin 1956; Oehler 1973; Riggs 1998; Seeman and Dancey 2000; Tankersley and Haines 2010). However, with few exceptions past work primarily focused on two burial mounds associated with the site (Drooker 1997; Oehler 1973). Using Oehler's (1950) excavation data, Griffin (1952:187) classified the Newtown Focus based on limestone-tempered pottery and a dense Late Woodland midden at
Turpin, which became its type-site: “since the Turpin Farm is well known as a Fort Ancient site, it is suggested that this complex be referred to as Newtown…At this particular site there is little or no indication of a gradual development from the Newtown Focus into the Turpin Component of the Fort Ancient culture.” This explains both Griffin’s nomenclature (Turpin is located near Newtown, Ohio) as well as his initial impressions regarding connections between the Late Woodland and Fort Ancient components of the site. Following conventions at the time, cultural change at Turpin was considered a result of sequential migration (e.g., Starr 1960:61).

A series of three primary investigations have been conducted at the Turpin site, spanning over a century. The first, conducted in 1885 by Harvard, focused on exploring the landform, which was known locally as a rich archaeological site. The second, conducted in the 1940’s and 1970’s by the Cincinnati Museum of Natural History (CMNH), focused on two burial mounds and a few small excavation blocks throughout the terrace. The most recent excavation was conducted by Rodney Riggs (1998) as part of a dissertation project at the University of Wisconsin-Madison. Each of these projects will be discussed in terms of methods and findings, with new insights gleaned through detailed examination of their field notes when relevant.

Harvard Excavations

Turpin was first excavated by Dr. Charles Metz, a local avocational archaeologist, at the behest of Dr. Fredrick Putnam of the Peabody Museum, Harvard. Excavations occurred from June to December of 1885. Metz explored several sites throughout the local vicinity, ultimately excavating a cemetery, segments of numerous structures, and several pit features on the Turpin site proper (Metz 1885). There has been some confusion as a result of the Turpin family owning multiple properties throughout the region, which has led to false association of some artifacts with the Turpin site. This issue will be discussed below. Metz’s excavations at Turpin helped set the foundation for Fort Ancient studies, as Griffin (1943) used these collections to complete his seminal analysis of stylistic and temporal trends in Fort Ancient ceramics. Using these data, Griffin assigned Turpin to the Madisonville focus of southwest Ohio. Although this taxon was
later suggested to be late (post-AD 1400) in the Fort Ancient sequence, Griffin's original classification was ahistoric and primarily geographic.

For excavations in the late 19th Century, Metz's methods and field notes were surprisingly thorough. Excavations appear to have been well-conducted and field notes are thorough and include maps and descriptions of features. Unfortunately, at the scale of the site, Metz's notes do not allow any cultural features to be reliably placed on the landscape. Excavations were accurately mapped in blocks, but blocks have no spatial reference to reality other than the coarse resolution provided by the natural terrace edge (Figure 6.2). Attempting to anchor these blocks to the landscape demonstrates how problematic this issue is (Figure 6.3); many of these blocks appear to have measured approximately 75m (~250ft) to a side. Despite this issue, coarse spatial patterning in diagnostic material and architectural styles can still be examined. In considering Metz's findings, architectural features from each block will be reconstituted from his original field notes, after which the spatial distribution of diagnostic artifacts will be presented.

Metz’s excavations were reconstructed with the above limitations with mind in order to understand basic trends in site structure. This was made difficult because the field notes on file are a photocopy of a photocopy and Metz’s notes were handwritten in script. However, in most cases excavation areas were able to be reconstructed. Measurements were taken for each feature from a center point (assumed here to be the center point of the block) using a traditional tape and compass approach, so all points are in feet and degrees. Using these data, points were input into Draftsight, a freeware CAD program, which allows for the measurement of distance and angles. The following findings in terms of architecture reflect the results of this reconstruction.

Metz (1885) discovered numerous wall trench structures at Turpin (e.g., Figure 6.4). Although these features are referred to as “ditches” or “ditches and pockets,” it is clear that they are wall trench segments. Once mapped, the distribution of these features suggests that wall trench structures were largely ubiquitous across the terrace, with the exception of Block 2 in the center of the landform (Figure 6.5). Architectural remains were present in Block 2, but are indicative only of wooden post structures, a more traditional form of architecture in this region (e.g., Baby 1971). In the western end of the
landform (Blocks 3 and 4), the remains of at least four wall trench structures were encountered, along with the remains of wooden post structures. In Block 3, it appears as though wall trench buildings and wooden post buildings were spatially (if not temporally) proximate. In the eastern portion of the landform (Blocks 1 and 5), the remains of at least four additional wall trench structures are evident. In Block 1, much like Block 3, wall trench structures are spatially related to what appear to be the remains of wooden post structures. The general trends noted from examination of these field notes are that wall trench structures were common, although not in the very center of the landform, and that in terms of density, most of the habitation-related activity seems to have taken place in the central portion of the landform (Blocks 1, 2, and 3). These findings fit well with a recent study of wall trench structures in the region (Cook and Genheimer 2015).

In addition to architectural information, mapping the general distribution of diagnostic artifacts recovered by Metz proves useful. Previous overviews suggest that some sherds were identified at Turpin with *Ramey-like* designs (e.g., Drooker 1997: Figure 4-8; Griffin 1943: Plate LXXXIV), which are common in and around Cahokia (e.g., Pauketat and Emerson 1991). A sample of sherds analyzed from the Peabody museum suggests that Metz recovered at least five sherds with *Ramey-like* motifs from Turpin in addition to numerous motifs that are not typically encountered at Fort Ancient sites. Additionally, a vessel identified as a Mississippian *Powell Plain* style (Griffin 1943) was recovered from Turpin. Mapping the distribution of Ramey sherds with confident proveniences in Metz’s excavation blocks suggests that they were limited to the center of the landform, in Blocks 1 and 2 (Table 6.1; Figure 6.6). These blocks are also where the Late Woodland stone mound and Fort Ancient earthen mound were located.

In addition to style, ceramic technology is roughly diagnostic of time period in this region (e.g., Riggs 1998). Rock temper is typically of Late Woodland origin, while shell temper more is more likely Fort Ancient. Because sherds from Metz’s excavations were overwhelmingly shell-tempered, determining spatial patterning in rarer limestone tempered sherds is more informative. Although evidence of limestone tempering in Metz’s collection is minimal, it is largely constrained to the center of the landform.
(Table 6.1; Figure 6.6), near the early Fort Ancient burial mound and evidence of Late Woodland habitation identified by Oehler (1973).

Temporally diagnostic projectile points were also mapped in order to determine spatial patterns (Table 6.1; Figure 6.6). This includes Late Woodland Lowe Cluster spear points (Justice 1987:208), late Late Woodland Jack’s Reef arrow points (Justice 1987:215-219), and Fort Ancient triangular arrow points (also referred to as Madison Points) (Justice 1987:224-230). Lowe Cluster points are concentrated in the central portion of the site (Block 2), with lower density in the eastern portion and none in the west. Jack’s Reef points are also concentrated in the central portion of the site (Blocks 1, 2, and 3) with none on either terrace edge. Fort Ancient Triangle points were primarily limited to Block 1, with low densities in Blocks 2, 4, and 5; none were recovered from Block 3. As a general trend, Late Woodland points were most commonly constrained to the center of the landform while Fort Ancient points were recovered most frequently from the eastern and western terraces edges.

Although preliminary, examination of Metz's field notes for spatial patterning of diagnostic characteristics suggest that Late Woodland activity at Turpin may have been limited to the area surrounding the Late Woodland stone mound as well as the early Fort Ancient burial mound. This is also the case for Ramey-style vessels, suggesting a link (or at least spatial redundancy) between Late Woodland and/or early Fort Ancient activity and Mississippian influence. Remains of Fort Ancient habitation are generally located on the eastern and western edges of the terrace, with the exception of the earthen burial mound itself. Although these patterns may not hold given continued testing, they represent an educated estimate based on Metz’s excavations and provide patterns against which new data can be tested.

Cincinnati Museum of Natural History Excavations

The Cincinnati Museum excavations were primarily conducted from 1946-1949 (and again briefly from 1976-1979) and largely focused on investigating two burial mounds on the Turpin property (Oehler 1973), along with two other small contexts on the terrace (Figure 6.7). Excavations were led by Charles Oehler. Excavation followed
Glenn Black’s methodology, who had recently headed excavations at the Angel site in Indiana (1939-1942) as part of a WPA project (Black 1967). Black helped set up the site grid at Turpin and aided in excavation on a number of occasions (Oehler 1973). Black’s “Angel Method” as it has become known, typically involves a 5 or 10 foot grid arranged around a center line, with units to the west of this line labeled Left or L, and those to the right labeled Right or R. The 0-0 point is at the base of the grid on the center line, so a unit 5 up and 3 to the left of the center line would be denoted as 5-L-3. At Turpin, both 5 and 10-foot grids were used. In the “Mound Area” around the Fort Ancient mound (discussed below), a finer 5-foot grid\(^2\) was used (Figure 6.8), while in the remaining areas, a more general 10-foot grid was used.

Two burial mounds were excavated in the 1946-1949 field seasons. The first mound, labeled the “Stone Mound,” is located on the northwestern terrace edge and contained numerous secondary burials (i.e. cremations and bundles), a number of flexed individuals (interpreted as Late Woodland in origin), and a small number of extended intrusive Fort Ancient burials. The conclusion that this feature represents a Late Woodland burial mound is consistent with the spatiotemporal distribution of stone mound mortuary facilities in this region (e.g., Kellar 1960; Seeman and Dancey 2000:595). The earthen burial mound, referred to in excavation notes as “Mound,” contained primarily extended burials with a small number of cremations. This mound was surrounded by a unique burial pattern (referred to as “Mound Area”) in which individuals were placed in a large continuous oval pattern around the burial mound, leaving an open space east of the mound (Oehler 1973: Photo 54; Figure 6.9). Together, the Mound and Mound Area produced evidence of at least 229 burials (Drooker 1997:93). Notably, with the exception of two individuals, the burials in this area were all extended, a pattern that stands in contrast to the earlier Late Woodland style.

Remnants of at least two structures were also discovered. Postmolds of the first were visible beneath the Fort Ancient mound at the base of a Late Woodland midden which was discovered beneath the mound (Oehler 1973: Photo 6). This structure measured \(~13\times 7\) feet \((3.9 \times 2.1 \text{ meters})\) and was interpreted as a Late Woodland house.

\(^2\) Although in each other area this grid was oriented North-South, the Mound Area excavation grid was rotated 270 degrees, so that the 0-line was in the east and the grid numbers increased as one moved west.
The second, located approximately 60 meters to the northwest near the historic Turpin farmstead, measured ~14 x10 feet (4.2 x 3.0 meters) and has been interpreted as a Fort Ancient house (Oehler 1973: Photo 5). Based on the burial mounds noted above, these two structures, and middens with large amounts of ceramic, stone, and faunal debris, Turpin was interpreted as two successive villages. Oehler (1973:59) suggests that “there must have been a number of late Woodland (Newtown Focus) towns already established and flourishing on the sites of most of these late Ft. Ancient villages…at the time of the Mississippian (Ft. Ancient) intrusion.” In this statement we see a) the extrapolation of one structure to not only Turpin as a town, but the supposition of multiple Late Woodland towns, and b) the idea that the Fort Ancient component reflected an intrusion of new people.

A comprehensive site map of Oehler’s (1973) excavations at Turpin was never published. As such, general site structure and the relationship between Late Woodland and Fort Ancient occupations are not thoroughly understood. Despite interpretations of two potentially successive villages with related burial mounds, the spatial relationships of structural remains are ambiguous. Diachronic trends beyond assumptions of cultural ‘intrusions’ at Turpin are understandably unclear. Using field notes to map all post-molds and burials in addition to the outline of the burial mound itself provides insight into the relationship between these features.

The Fort Ancient burial mound and the pattern of burials around it were mapped first in order to determine the accuracy of Oehler’s (1973: Photo 54) original image, which implies a burial pattern inconsistent with any other that I am aware of in the Midcontinent. This pattern was accurate; burials are located both within the mound as well as in a large oval pattern around the mound with the majority of heads in the pattern pointed toward the central mound (Figure 6.10). Two characteristics stand out about the burials within the mound. First, interments are not distributed equally within the mound’s boundary. Instead, they are tightly clustered within a ~20x20 foot area at the mound center; most also occur within four feet of the top of the mound (Figure 6.11). This pattern could be explained by a sub-mound structure, earthen platform, or earlier mound complex like that seen at the Baum site in central Ohio (e.g., Brady-Rawlins 2007:Figure
Preliminary mound profiles support this interpretation (Figure 6.12). Based on this profile map, it is possible that this initial construction reflects a platform mound upon which the first burials were placed. Second, the most notable individual in the earthen mound, a male buried with copper ear spools and bounded by charred logs or bark (Oehler 1973: Photo 53), was interred outside of the central cluster of burials. He was located beneath the western edge of the mound, significantly deeper than other burials, and potentially within a previously unidentified structure.

Beneath the earthen burial mound were a number of postmolds, many of which likely represent the remains of structures. The most apparent was a small (~13 x 7 ft) rectangular structure reported by Oehler (1973: Photo 6), interpreted as a Late Woodland house. An additional, previously unidentified structure or structures to the west of the mound became evident when all postmolds were mapped (Figure 6.13). Notably, the male burial discussed above was interred within the boundaries of this potential structure. Two other concentrations of postmolds are noteworthy. First, a cluster of posts northeast of the mound may represent another previously unidentified structure. Second, a loose cluster of posts southeast of the mound may also represent prehistoric architecture associated with a cluster of burials, although this case is less clear. It should be noted that all postmolds associated with these potential structures are of similar depth and appear stratigraphically beneath the Late Woodland midden in sterile subsoil. This may explain Oehler’s justification for classifying the most evident structure as Late Woodland. However, it is probable that at least some of these posts are the result of Fort Ancient architecture which extended through the ~40 cm deep Late Woodland midden.

A more complete understanding of the spatial relationship of features excavated by the CMNH clarifies questions regarding burial patterning but raises questions regarding mortuary practices and Late Woodland habitation. It is likely that this location was central to activities that occurred at Turpin; burials and architecture appear to be oriented to the burial mound. Burials in the pattern around the mound suggest a continuation of mortuary ritual beyond the initial burial event(s). It is clear that many

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3 This assumption has precedent. Excavations in Test Unit 1 (see Appendix C) revealed the remains of a Fort Ancient wall trench structure at 80 cm below surface. This feature had cut through a preceding Late Woodland midden. If all midden had been removed as in the case of the CMNH excavations, this feature would appear as a series of deep posts.
burials were intentionally placed so that their heads pointed toward the mound and their bodies faced away. These findings bring into question interpretations that architecture in spatial association with the mound was domestic in function (Figure 6.14). It is difficult to tell from these limited lines of evidence, by at least some of the architectural remains identified here as being proximate to the mound/pattern may have served a mortuary function (i.e. charnel facilities), an interpretation which would influence generally held theories of successive villages at Turpin.

Riggs Excavations

As part of his dissertation, Rodney Riggs (1998) analyzed ceramic assemblages in the lower Miami River Valley to explore diachronic regional trends in technology and style. His analysis, which included Turpin, supported the general occupational history suggested by Oehler (1973). Riggs excavated three test units near the CMNH mound excavation block (see Figure 6.7). Stratigraphic and chronological data suggest that a ~40cm Late Woodland midden, dated by Riggs to cal. AD 766-1043, existed below a ~50 cm Fort Ancient midden, dated between cal. AD 1040-1425 (Riggs 1998). This represents the first systematic radiometric dating study at Turpin. Results are unclear regarding temporal overlap between Late Woodland and Fort Ancient components.

Based on material from these excavations, Riggs (1998) noted a shift in ceramic technology in the Lower Little Miami Valley from rock temper to primarily shell temper over the course of the Woodland and Late Prehistoric periods (Figure 6.15), a finding consistent with regional trends (e.g., Cook and Fargher 2008). Among the earliest deposits in his study (undated Hopewell/Middle Woodland), rock (grit and/or limestone) temper dominates (100%). In the Late Woodland (Newtown) contexts, rock temper still dominates (97%), but shell (3%) was introduced. In the Fort Ancient (Madisonville) contexts studied by Riggs, shell becomes the primary (77%) material used to temper ceramics, with rock used less frequently (33%). At Turpin, Fort Ancient assemblages consisted of 42% shell tempered ceramics and 58% rock tempered ceramics. This proportion may be suspect, however; Late Woodland and Fort Ancient contexts here may be more mixed than suspected.
Temporal Examinations

Turpin is one of the best-dated sites in the region, having seen multiple rounds of dating over the past 50 years (Table 6.2; Figure 6.16). Despite this, our understanding of what actually occurred at Turpin is limited. Early dates like Griffin’s (Crane and Griffin 1961) were submitted merely to provide a general temporal anchor for the site. Large error ranges for dates like this, which calibrates to AD 1020-1521, meant that such general placement is all that could be hoped for. In this case, Griffin’s date (M907) confirms that a log in one pit somewhere on the landform (it is unclear where or who excavated it) is Fort Ancient in origin.

Riggs’ (1998) approach to dating was geared towards the problem of understanding the timing of Late Woodland and Fort Ancient occupations at Turpin. In this sense, his strategy of dating midden levels and encountered features in test units makes sense. Four of these dates were sampled from Late Woodland contexts (Table 6.2) and date from Middle Woodland (UGA4485; cal. AD 80-406), early Late Woodland (WIS1751; cal. AD 425-670), early/late Late Woodland (WIS1750; cal. AD 603-881), and late Late Woodland (WIS1749; cal. AD 695-1021) periods. Two dates also came from Fort Ancient contexts, ranging from cal. AD 1037-1268 (UGA4483) and cal. AD 1040-1285 (WIS1793). Riggs’ research suggests that Turpin was occupied at least intermittently at some points between the Middle Woodland and Late Prehistoric periods, or for about 1200 years between cal. AD 80-1285.

A series of new radiocarbon dates (Cook 2014) has helped expand our understanding chronology in this region, especially at Turpin (Table 6.2). These dates provide a richer understanding of the relationship between the Late Woodland and Fort Ancient occupations at the site. Cook’s (2014) research focused on dating annuals and human bone in an attempt to understand the relationship between Oehler’s mound and sub-mound contexts. Confidence ranges for dates from the “Old Village” component (Oehler’s [1973] original designation for Newtown) span from cal. AD 656-989.

4 Old Village is a confusing term. Griffin (1943) uses this in reference to a phase of American Bottom prehistory. Oehler (1973) presumably uses Old Village to describe the Late Woodland/Newtown component at Turpin. Presumably, he was using this term descriptively (i.e. it is an older village than the Fort Ancient materials), rather than in reference to the American Bottom like Griffin.
extending primarily through the late Late Woodland period. Some earlier dates exist, although their context (“2nd Old Village”) is unclear based on field notes. These may represent spatially distinct (either vertically or horizontally) contexts. Fort Ancient dates extend from cal. AD 1023-1295, which largely corresponds with the early period of this sequence. Thorough absolute dating provides a revised understanding of Turpin in which occupation extends from the early Late Woodland through the Fort Ancient period. The relationship between these occupations remains unclear.

Isotopic Examinations

Diet

Turpin has long been used to examine the transition to maize agriculture using carbon isotopes (Greenlee 2002; Cook and Schurr 2009; Van der Merwe and Vogel 1978). One of the earliest examinations of prehistoric diet using isotopic evidence was Van der Merwe and Vogel’s (1978) study into the diet of Eastern Woodlands groups. Of the 10 sites examined, Turpin provided the strongest evidence for maize consumption, suggesting that people on the periphery of the classic Mississippian heartland ate more maize in general. This work set the stage for using Turpin as an avenue for examining subsistence change in this region.

Greenlee’s (2002) dissertation provides an intensive examination of subsistence practices in the Middle Ohio Valley, including isotopic examination of skeletal material from three contexts from Turpin: the stone mound, the earthen mound, and the surrounding cemetery pattern. Findings suggest that individuals from Fort Ancient contexts (the earthen mound and surrounding burials) ate more maize than those from Late Woodland contexts (the stone burial mound). However, the stone burial mound produced mixed results; half of the sampled individuals produced evidence of maize consumption on par with Fort Ancient individuals, while the other half ate very little to no maize (Figure 6.17). This may either reflect Late Woodland maize consumption or it could be a result of intrusive Fort Ancient burials in the Late Woodland stone mound, as a few extended (typically considered to be Fort Ancient) burials were placed into this
mound. Both options are also possible without better chronological understanding of these burials.

Cook and Schurr (2009) use Turpin in a broader examination of subsistence and settlement change in the Middle Ohio Valley. They found that in general, larger site size and Mississippian artifacts correspond with a higher percentage of maize in the diet. Using this information, they highlight the utility of examining subsistence change as a line of evidence indicating cultural contact and migration. Notably, sites in the lower Miami Valleys like State Line, Guard, and Turpin, stand out as large communities with Mississippian influence whose inhabitants ate significant amounts of maize.

Migration

Recently, Turpin has also been used in an attempt to trace the moment of people within and between regions. Cook and Price (2015) used strontium isotopes collected from archaeological fauna and local water samples to set signatures for areas throughout the Midwest. With this foundation in place, they then tested human remains from seven Fort Ancient sites, including Turpin. Results suggest that not only was migration an important factor in Fort Ancient life, but that the highest proportion of non-local individuals were interred in the burial mound and pattern at Turpin (Figure 6.18). While 65.7% of sampled individuals (n=46) demonstrated values in line with local ratios, the remaining one-third originated from many parts of the Mississippian world. In descending order, 15.8% produced values consistent with the region around Cahokia, 12.8% were from either the Middle Cumberland region of Tennessee or the South Park site of Northeast Ohio (which have overlapping local signatures), 4.3% were from the South Park site, and 1.4% were from the Angel site in Indiana.

These regions, particularly Cahokia, Angel, and the Middle Cumberland, are well in line with archaeological evidence from Turpin and other early Fort Ancient villages in the lower Miami Valleys. One thing to note regarding strontium and migration is that the non-local values identified above only would identify first-generation migrants. The second generation, or the children of these initial migrants, would appear local since they had been consuming local food and water. Because of this, the suggestion that one-third
of the people sampled from Turpin were non-local in origin is conservative (Cook and Price 2015). Put another way, a multi-generation cemetery of a migrant community would look like a mixture of local and non-local individuals, which may be the case at Turpin. This idea will be revisited after a thorough investigation of domestic contexts at Turpin.

**Refocusing Questions**

**Late Woodland Period**

Griffin’s (1952) recognition of the Late Woodland component of Turpin as the defining Newtown site had important ramifications for understanding and studying Late Woodland period dynamics in the Middle Ohio Valley. It codified the sub-mound structure and related material culture (including rock tempered, cordmarked ceramics) identified by Oehler as representative of Late Woodland settlement in Southwest Ohio, ultimately resulting in the classification of this component of Turpin as the Newtown type site. Subsequent studies have attempted to identify Newtown sites and components (e.g., Genheimer 1981; Railey 1984), but the Newtown Focus remains understudied (Seeman and Dancey 2000). This is potentially because of problematic assumptions regarding the Late Woodland at Turpin.

Turpin, as the type-site for sedentary Late Woodland peoples, should provide compelling evidence for village life including markers of sedentism, agricultural production and social reproduction (e.g., Bandy 2008; Byrd 1994, 2005; Kolb and Snead 1997; Kuijt 2000, 2002). Remapping previous excavations has raised questions as to whether Turpin represents a Late Woodland village. First, is the architecture identified beneath the earthen mound domestically or ritually oriented? Evidence is unclear at present; there are few Late Woodland domestic structures with which to compare the sub-mound structure(s). An alternative explanation is that this structure could represent a mortuary preparation facility similar to those found at the Collins site in Illinois by Douglas (1976) and at Aztalan in Wisconsin (e.g., Price et al. 2007). Seeman (1979) and Brown (1979) note that mortuary preparation facilities and charnel houses are common in prehistoric Woodland contexts as well as in ethnohistoric accounts of southeastern
groups. The spatial association of structures with the earthen burial mound suggests that interpretations of a Newtown village must be viewed critically.

Second, considering villages are defined based largely on sedentism and agricultural subsistence (e.g., Braidwood 1961), is there evidence in the Late Woodland midden of agricultural debris? Evidence of maize is present at this site in the form of both charred kernels and cobs. Of six maize samples dated (Cook 2014), three came from the “Old Village” level, Oehler’s (1973) term for the Late Woodland midden (see Table 6.2). Notably, these three cobs are 8-row (cal. AD 689-950), 10-row (cal. AD 777-989), and 12-row (cal. AD 567-636) variants, suggesting that a diversity of maize variants were present during the Late Woodland occupation of Turpin. However, it is unclear if these burned cobs reflect behaviors associated with farming or behaviors associated with ceremonies (potentially a proto-Green Corn Ceremony [e.g., Wallace 1956]), much like is suggested for limited evidence of Hopewell-era maize (Wymer 1992). Ethnobotanical sampling was not conducted during early excavations, limiting our understanding of subsistence practices at Turpin. Intensive use of maize at Turpin during the Late Woodland period is not supported by isotopic evidence (Greenlee 2002), further calling into question assumptions of agriculture.

The spatial distribution of diagnostic artifacts helps sharpen understanding of Late Woodland occupation on the landform. Late Woodland projectile points (Lowe Cluster and Jack's Reef types) occur almost exclusively in the central portion of the landform. Similarly, limestone tempered ceramics, typically indicative of Late Woodland ceramic production, are also constrained to the center of the landform. Because the resolution of Metz’s excavation blocks is coarse, further inferences are limited. However, the basic trend is that of constraint to the central portion of the terrace, which points to close association of Late Woodland material with the stone burial mound and/or the earthen burial mound locations.

In summary, initial interpretations of a Late Woodland village at Turpin are questionable. It is clear that the site was occupied during the Late Woodland period, but whether this occupation reflected year-round habitation, repeat use of a persistent place, or a locus of mortuary ceremony remains unclear. Also unclear is precisely where on the
landform Late Woodland activities occurred, although coarse information from Metz suggests that these activities may have been constrained to the central portion of the landform.

**Fort Ancient Period**

Based on previous work, Drooker (1997) differentiates Turpin into two Fort Ancient occupations. Referencing Oehler’s (1973) work, “Turpin 1” represents a “village site with large burial mound” (Drooker 1997: Table 4-4) that was occupied between AD 1100-1500. Assumedly this refers to the structure identified by Oehler (1973) located 60 meters north of the earthen burial mound. “Turpin 2” is based on Metz’s (1885) excavations, and represents a village east of Turpin 1 with Anderson and Madisonville ceramics tentatively dated to AD 1200-1650. To summarize, the Fort Ancient component at Turpin may reflect two villages and extend throughout the entire Fort Ancient sequence. Reexamination of field notes from each excavation suggests that these interpretations may be problematic.

The first issue is the presence of late Fort Ancient (i.e. Madisonville) material. Turpin is often considered to have been occupied late into the Fort Ancient sequence (c. AD 1400-1650) based on the presence of Madisonville-style ceramics recovered by Metz (e.g., Drooker 1997; Griffin 1943). In order to assess the spatial distribution of these artifacts, provenience information was examined for Madisonville-style sherds from Metz’s excavations, which are curated at the Peabody Museum, Harvard. It turns out that none of these sherds were recovered from Turpin proper. All evident Madisonville-style ceramics in this collection were recovered from the Johnston Turpin site (33HA699), a nearby but archaeologically distinct location. Similarly, a diagnostically late disk pipe originally cited as having been recovered at Turpin was incorrectly assigned; it was recovered from the Peach Orchard site, a nearby hilltop occupation. These new findings remove styles traditionally indicative of a late Fort Ancient component at Turpin; remaining diagnostics point to Late Woodland and early Fort Ancient occupations.

Alternatively, diagnostic artifacts point to an occupation early in the Fort Ancient sequence. Ceramics are primarily undecorated or decorated with guilloche motifs, which
are recovered most commonly from early to middle Fort Ancient sites in this area (Cowan 1987). Diagnostic triangular projectile points are primarily excurvate-based (Type 2), suggesting an early occupation (e.g., Cook and Comstock 2014; Railey 1992). Additionally, wall-trench architecture, which some scholars may falsely presume is a late form in this region, may have appeared earlier than generally accepted. Overall, a reassessment of the Fort Ancient occupation at Turpin supports an early occupation of the site, generally not extending beyond the middle Fort Ancient period (c. AD 1300), a finding consistent with available radiocarbon dates.

The earthen burial mound represented a focal point for Fort Ancient activities at Turpin. Bone samples from three individuals were submitted for AMS dating in order to explore differences between within-mound burials and those from the surrounding pattern (Cook 2014; see Table 6.2). Findings suggest that this mound/cemetery complex was utilized throughout the Fort Ancient occupation of Turpin. The within-mound burial (#116) dates from cal. AD 1024-1207, suggesting it was early in the Fort Ancient sequence. Two individuals from the burial pattern dated to cal. AD 981-1162 (burial #75) and cal. AD 1169-1295 (burial #167), which are indistinguishable from the mound burial, suggesting this pattern likely existed during and after the construction of the burial mound. This mortuary complex undoubtedly served as an important ritual integrative facility (sensu Adler and Wilshusen 1990) for the Fort Ancient community members. Overall, dates point to early use of the mound itself, followed by burial in the surrounding pattern until the site was abandoned c. AD 1300.

**Examining Site Structure at Turpin**

The preceding overview and reassessment of past fieldwork at Turpin has highlighted the unique nature of this site and its ability to address questions of cultural transitions. It has also revealed key deficiencies in earlier research strategies, including judgmental sampling and a focus on burial mounds. Reinterpretation of earlier findings raises new questions. The overarching questions are (i) what was the nature of Late Woodland activity at this site, and (ii) when and how did Fort Ancient people occupy this landform? In order to address these questions, a systematic understanding of the spatial
structure of prehistoric occupations at Turpin is required. To generate the data required to understand site structure, a three-part geophysical and archaeological survey was conducted. The foundation of this research into site structure is a magnetic gradiometry conducted by Burks and Cook (2013), which is described below. Using this work as a starting point, a mechanical bucket auger survey and a magnetic susceptibility survey are used to ground truth gradiometry results and refine understanding of the horizontal and vertical distribution of occupation on the landform.

Geophysical Prospection and Interpretations

A magnetic gradiometry survey was conducted at the Turpin site in January 2013 by Drs. Jarrod Burks and Robert Cook using a Fluxgate Gradiometer (Figure 6.19). Data were collected at eight readings per meter in 50 cm transects, which is the standard for this region and has been shown to effectively identify prehistoric features (e.g., Cook et al. 2015). The limitations of dense land-cover around the periphery of the terrace prevented survey of large areas, including where an earthen burial mound and a stone burial mound were once located (Oehler 1973). Survey results from the available area were nonetheless informative and helped shape this project's research strategy.

Two areas are immediately evident in terms of their magnetic signatures (Figure 6.20). The first, located west of the historic driveway, is a small circular arrangement of approximately six rectangular anomalies, which are located between where the earthen burial mound and stone burial mound once stood. This area will be referred to as Locus 1. The magnetic anomalies in this area are reminiscent of burned Fort Ancient structures identified through geophysical survey and ground-truthed through excavation by Cook et al. (2015) at the Guard site in southeast Indiana. These anomalies at Turpin are tentatively interpreted as structural in nature, although investigation is required to confirm this hypothesis.

The second area of interest, referred to as Locus 2, is a similar cluster of four to five anomalies located east of the historic driveway, although these are less explicit in the geophysical data. The most evident pattern associated with these anomalies is that of a small central area with a high magnetic signature surrounded by less magnetic soil, all of
which is surrounded by a roughly circular pattern of more magnetic soil. The relatively ephemeral signature of these anomalies may be because they were unburned structures of some sort, or perhaps structures with a different architectural style (i.e. shape, size, or construction technique) than those in Locus 1. Not all of these anomalies are as clear as others, but they are identifiable and arranged in a circular pattern around an area that is comparatively free of magnetic anomalies, which could represent a plaza. This Locus will be investigated to assess the nature of prehistoric occupation on this part of the terrace.

Although these two areas will garner much of the focus for purposes of determining site structure and cultural affiliation, there are other areas of interest in the magnetic survey which will be investigated as time allows, but are not part of this dissertation. Many of these anomalies are likely pit features or earth ovens and thus may speak to secondary refuse or cooking facilities, respectively.

**Oakfield Soil Core Survey**

Small soil cores are frequently used to delineate site boundaries and understand stratigraphic relationships in archaeology (e.g., Stein 1986, 1991), as well as to provide preliminary verification of sub-surface geophysical anomalies (e.g., Pacheco et al. 2009; Kvamme 2008). In order to delineate site boundaries and identify areas of overlapping midden at Turpin, a coring survey was conducted. This survey utilized a ¾ inch diameter Oakfield core to gather soil data at a 20 meter interval (see Figure 6.21). A systematic sampling strategy with a 20 meter interval was used because the extent of the site was unknown; a larger interval would have risked missing important data while a smaller interval across the landform was time-prohibitive. Each location was cored to a depth of 90cm (the full length of the probe) when possible, typically resulting in three 30cm soil columns per sample location. Previous work suggests that most deposits at Turpin rarely exceed 100cm, so 90cm of data in each location should provide representative information. For each successful 30cm core segment, a photograph was taken and a soil sample was collected. Soil characteristics (color and texture) and changes in stratigraphy were noted in detail for each location.
One soil sample from each 30cm segment of each core was collected for geophysical tests aimed at identifying occupation areas vertically and horizontally across the landform with the goal of refining understanding of site structure. Since the magnetic signature of soil is influenced by human activities (e.g., Crowther and Barker 1995), examination of soil from throughout the landform will provide a three-dimensional understanding of human occupation at Turpin. In this survey, higher susceptibility levels reflect a higher degree of human alteration of the landscape. For each soil sample at each core location, magnetic susceptibility was measured using a Bartington MS2B dual frequency susceptibility meter. In most areas, this provides at least readings from 0-30cm and 30-60cm below surface, giving plowzone and sub-plowzone readings. In a smaller number of locations (as a result of rock, hard clay, or other obstructions) a 60-90cm level was also sampled.

**Bucket Auger Survey**

In addition to the coring survey described above, a mechanical bucket auger was used to gather detailed information regarding material culture across the site. Although no longer commonly used in many archaeological research programs, bucket augers provide important stratigraphic and artifactual data. The relatively expeditious nature of sampling with these tools allows for extensive, flexible surveys that provide both horizontal and vertical coverage (e.g., Cannon 2000). These handheld tools provide an approximately 10cm-long hollow cylinder with a digging bit attached to a long handle. The tool used in the present study extends to a maximum depth of 120cm, which is deep enough to generate data from the approximately meter-deep deposits at Turpin.

The 20 meter grid used for the coring survey detailed above was also used to place augers in order to ensure that magnetic and artifactual data are comparable across the landform. At each location, the bucket auger was used to generate 10cm levels of data to a minimum of 100cm and when necessary, a maximum of 120cm. Soil from each level was screened through standard 1/4 inch mesh to control vertical distribution of artifacts, which were separately bagged and analyzed by level. The original 20m grid was designed to identify vertical and horizontal resolution of anthrosols and cultural deposits, and
resulted in a total of 73 augers across the landform. Upon examination of initial findings, two areas of high artifact density were identified and the sampling interval was reduced to 10m, resulting in an additional 38 augers, for a total of 112 (Figure 6.21). The first location is near the prehistoric Late Woodland stone burial mound and a ring of geophysical anomalies interpreted as structures (Locus 1). The second is located on the eastern portion of the terrace, near another, less clear ring of anomalies (Locus 2). Other areas were relatively sparse in terms of artifacts and were not investigated in more detail than the 20m sample at this time, although future work may including expanding the scale of this survey.

Spatial Analysis of Survey Results

Data derived from geophysical and artifactual sources allow for a series of vertical and horizontal distributional maps to be created, ranging from simple density distributions to detailed distributions of diagnostic artifacts. Analyses are conducted ArcGIS v. 10.2. In order to more fully understand findings at the site level, results are interpolated using an Inverse Distance Weighting (IDW) algorithm. IDW takes each possible location in a study area and predicts its value based on the closest available points (called the "search neighborhood") in a dataset. The result is a rasterized surface which represents predictions based on input point data. Interpretation of these maps includes both qualitative visual assessments of patterning as well as quantitative tests of spatial clustering. Each map is visually examined for patterns which correspond with other sets of data (i.e., geophysical, other artifact categories, landform characteristics). These patterns are then described in terms of their relationship to site structure and prehistoric behaviors. In order to statistically assess patterns, each dataset is tested using statistical test of spatial clustering in ArcGIS to identify significant clusters and voids in the distributional data. Findings supported by both qualitative and quantitative assessments represent verified patterns which speak to site structure and the distribution of activities on the landform.
Site Structure Survey Results

Magnetic Susceptibility Survey Results

Magnetic susceptibility measures from 0-30cmbs, although somewhat affected by historic plow disturbance, suggest distinct concentrations of prehistoric activity are evident on the terrace (Figure 6.22). The most telling divide follows the form of the terrace itself; a distinct void maps onto a low spot in the southwest portion of the terrace. Three areas demonstrate high magnetic susceptibility. First, the topographically high area at the center of the landform had high magnetic values, suggesting that the prehistoric inhabitants of the landform occupied or disposed of trash in this spot. Notably, this area maps onto and extends beyond the anomalies identified via gradiometry survey referred to as Locus 1. Second, the center of the landform, near the historic Turpin farmstead (around which prehistoric burials and architecture were found [Oehler 1973]) and the Fort Ancient burial mound, each demonstrate high magnetic values. Finally, the area east of the driveway, which corresponds with a circle of gradiometry anomalies referred to as Locus 2, also had high magnetic susceptibility levels.

The magnetic signature from 30-60cm is clearer than that of the plowzone, which is to be expected considering this level remains relatively undisturbed. The patterns evident at this level largely represent a tightening of those in the level above (Figure 6.23). Particularly, three areas again appear to have been loci of prehistoric occupation. First, the northern terrace edge, reflecting a high point on the landform just west of Locus 1, has some of the highest magnetic signatures. Second, the central portion of the landform, near prehistoric occupation and mortuary contexts, again appears as one of the most heavily occupied areas. Finally, the eastern portion of the landform (Locus 2) produced medium/high magnetic results, suggesting this area also represents a locus of prehistoric activity. Based on excavation at the site (both from the present project and Riggs [1998]), it is presumed that this 30-60cmbs level approximates the Fort Ancient occupation at Turpin. Based on this assumption, these findings corroborate patterns form the magnetic gradiometry survey performed by Burks and Cook (2013). The magnetic values between 30 and 60cmbs are the highest discovered in this survey, suggesting that prehistoric activity was most intense and/or long-lived at this level.
The lowest level that was sampled, 60-90cmbs, was more limited than other levels in that fewer points were sampled as a result of hard clay and impenetrable rocks. With this caveat in mind, findings still point to meaningful patterns (Figure 6.24). The only area that produced high magnetic susceptibility levels is the center of the landform, near where Oehler (1973) discovered remains of Late Woodland occupation (south) and evidence of occupation and burials that have not been conclusively dated near the historic Turpin farmstead (north). Based on previous excavation at the site, it is likely that these isolated areas approximate the extent of Late Woodland occupation of the site. If this is the case, it would point to a relatively constrained occupation of the landform, and one at least spatially dissimilar to the potential Fort Ancient concentrations described above. However, this part of the landform is consistent with the area that was used to construct the Fort Ancient burial mound discussed earlier.

Mechanical Bucket Auger Survey Results

Distributional data for each artifact type divided by totals, plowzone, and sub-plowzone are available in Appendix A. The most informative data comes in the form of artifact totals and the distribution of ceramics based on tempering material. The distribution of all prehistoric artifacts produces a clear pattern that reflects areas of prehistoric occupation and refuse disposal (Figure 6.25). Two areas on the landform produced dense deposits of artifacts. These represent both loci identified in the magnetic surveys described above. The first (Locus 1), located in the central portion of the terrace, appears to be a dense concentration of habitation debris located within a ring of suspected prehistoric structures. The second (Locus 2), located in the eastern section of the terrace, displays a different pattern. In this area, the distribution of artifacts reflects a circular or arc-shaped layout around a relatively empty central location. Additionally, in a few locations anomalies are present which may represent prehistoric pits, as they were particularly dense but surrounded by sparse distributions of artifacts. In general, this trend of two distinct loci along with outlying isolated concentrations remains accurate for most artifact types. Analysis of these results using a Hotspot analysis in ArcMap support
findings that these two areas are statistical outliers in terms of artifact density (Figure 6.26).

The material used to temper ceramics is also an important consideration, since temper has been shown to reflect temporal changes in the Little Miami Valley. Riggs (1998) found that although there is overlap, the general temporal progression of temper type is from limestone to grit (crushed igneous rock) to shell. As such, the distribution of ceramics by temper type proves useful. Shell tempered ceramics, which are considered a Fort Ancient characteristic in this region (e.g., Cook and Fargher 2008), are most commonly found in the central portion of Locus 1 and in an arc on the western edge of Locus 2 (Figure 6.27). Notably, both probable pits on the terrace edge contain large amounts of shell-tempered pottery, suggesting they are Fort Ancient in origin. An important void to note is the area around the Fort Ancient burial mound; very few shell-tempered ceramics were recovered from this area. Grit tempered ceramics were recovered from many of the same areas as shell tempered ceramics, including Locus 1 in the central part of the terrace (Figure 6.28). However, there are a few notable exceptions. In Locus 2, on the eastern part of the terrace, grit tempered sherds are distributed in an arc complementary to the shell tempered sherds noted above. Together, these two ceramic types form a circular pattern with a largely vacant center (Figure 6.29). Also, unlike shell tempered sherds, grit tempered sherds are present in small to moderate amounts in the area around the Fort Ancient burial mound. Limestone tempered ceramics are often considered representative of a Late Woodland, or Newtown occupation (Riggs 1998; Seeman and Dancey 2000) and were found in small quantities (Figure 6.30). Limestone tempered sherds were generally recovered in those areas where neither shell nor grit tempered sherds were densely distributed, suggesting differences exist between these two categories. However, limestone tempering is present in a small amount (4.15% by weight) of ceramics from augers, and thus patterns in this artifact type may not constitute significant trends.
Summary of Sub-surface Investigations

Sub-surface explorations of Turpin geared toward understanding site structure produced two significant patterns. First, two loci of prehistoric activity have been identified and ground-truthed. Although the gradiometry survey conducted by Burks and Cook was promising on a number of levels, the patterns suggested by this work needed to be verified. In Locus 1, the magnetic gradiometry survey identified approximately six potential rectangular prehistoric structures located in a circular pattern around a relatively void area that may represent a plaza with a few trash pits. Results from the bucket auger survey described here support this interpretation, although the central area produced significant amounts of prehistoric artifacts. This suggests that this central area may not have been a designated plaza area like later Fort Ancient communities (e.g., Cook 2008). This pattern is, however, similar to Guard, another early Fort Ancient community, which appears to have been arranged circularly, but with numerous pits in the center (Cook et al. 2015; Cook et al. n.d.). Locus 2, as identified via magnetic gradiometry survey, displayed a pattern of 4-5 potential circular structures, arranged in a circle around a distinct void, likely representing a plaza. The bucket auger survey supports the interpretation of an occupational space surrounding a vacant area. Magnetic susceptibility highlighted these areas at the sub-plowzone level (30-60cm below surface), indicating that these locations were loci of prehistoric activities.

Second, the occupation of the landform was complex and occurred over at least 1000 years. Results from both the bucket auger survey and test excavations suggest that there is a complex spatial (if not cultural) relationship between Late Woodland and Fort Ancient occupation of the landform. The bucket auger survey produced compelling patterning in rock and shell tempered ceramics which may point to different areas of the site being occupied by different groups of people. Magnetic susceptibility at 30-60cm and 60-90cm levels highlighted a spatial disparity. This difference may reflect different areas of occupation during the Late Woodland and Fort Ancient periods.
Summary: Contextualizing Turpin

This chapter has provided a critical overview of previous work conducted at the Turpin site, which is commonly held to reflect an AD 500-1000 Late Woodland (Newtown Focus) village and an AD 1000-1650 Fort Ancient village. Reassessing fieldwork from the 1880's and the 1940's, I have called these conclusions into question, suggesting that evidence of Late Woodland settlement is currently lacking and diagnostic evidence points to an early Fort Ancient occupation instead of a longer occupation over six centuries. Overall, judgmental sampling and a focus on burial mounds has not provided representative evidence of prehistoric occupation of the terrace upon which the Turpin site is located, which is troubling considering this site acts as the type site for the Newtown Focus (Griffin 1952), for Turpin Phase Fort Ancient sites (Cowan 1987) and Turpin Component of Madisonville Focus sites (Griffin 1943).

With these issues in mind, a multi-method survey was conducted in order to provide a representative understanding of site structure at Turpin. Using a previous magnetic gradiometry survey as a foundation, a magnetic susceptibility survey and a mechanical bucket auger survey were conducted to generate systematic vertical and horizontal understanding of prehistoric occupation of the landform. Results of these surveys suggests that at least two prehistoric communities were evident, one of which produced primarily shell tempered ceramics while the other produced a mixed assemblage of grit and shell tempered ceramics, suggesting Fort Ancient and potentially hybrid occupations, respectively. These two areas, referred to as Locus 1 and Locus 2, represent the primary focus of this project, which seeks to understand the transition from Late Woodland foragers to Fort Ancient agriculturalists.

This overview has also raised questions regarding how the early Fort Ancient occupation of Turpin relates to mortuary ritual, the movement of people, and connections to the Mississippian world. Archaeological, biological, and geochemical lines of evidence all suggest that Turpin was a confluence of many cultural groups during the early Late Prehistoric period. How such patterns relate to the development of what we refer to as Fort Ancient culture is an important question for understanding regional sequences. In a broader sense, how Turpin reflects the movement of agricultural communities provides
an understanding of this region in the context of the Neolithic transition. In order to address these questions, we must first have a solid understanding of household and community contexts at Turpin. The following chapter provides excavation data that clarify the occupational history of this site.
Figure 6.1 Turpin location and soil catchment map
Figure 6.2: Metz’s (1885) excavation blocks.

Figure 6.3: Metz’s (1885) excavation blocks in approximate locations on the terrace.
Figure 6.4: Example of Metz's (1885) field notes with an example of wall trench architecture.
Figure 6.5: Metz's excavation blocks mapped from original field notes. Shaded areas are wall trench segments.
Figure 6.6: Percent of diagnostic characteristics distributed across Metz’s excavation blocks, arranged West to East

Figure 6.7: Cincinnati Museum of Natural History Excavations at Turpin
Figure 6.8: Mound and Mound Area grid used for the Cincinnati Museum excavations with mound outline for reference.

Figure 6.9: Mound and Mound Area burial patterns as portrayed by Oehler (1973: Photo 54).
Figure 6.10: Mound and mound area burial pattern; reconstructed from CMNH field notes.
Figure 6.11: Depth of burials below top of Earthen Mound at Turpin.

Figure 6.12: Turpin mound profile at the 8’ line.
Figure 6.13: Mound and mound area architectural features; reconstructed from CMNH field notes.
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Figure 6.15: Ceramic Temper Data in the Lower Little Miami Valley – Simplified from Riggs (1998)
Figure 6.16: Radiometric Dates from Turpin. Calibrated Using Oxcal 4.2.4.
Figure 6.17: Scatter plot of δ13C values from Turpin burials. Data from Cook and Schurr (2009), Greenlee (2002), McCall (2013).

Figure 6.18: Scatter plot of 86Sr/87Sr values for individuals buried at Turpin. After Cook and Price (2015: Figure 8).
Figure 6.19: Magnetic gradiometry survey of the Turpin site, conducted by Jarrod Burks and Robert Cook, 2013.
Figure 6.20: Identified loci of potential communities in the gradiometry survey.
Auger Locations for Systematic Bucket Auger Survey of the Turpin Site

Figure 6.21: Location of Oakfield Cores and Bucket Augers
Figure 6.22: Results of magnetic susceptibility survey, 0-30cm below surface. Higher values (red) indicate anthropogenic disturbance. Black areas indicate Cincinnati Museum of Natural History excavations.

Figure 6.23: Results of magnetic susceptibility survey, 30-60cm below surface. Higher values (red) indicate anthropogenic disturbance. Black areas indicate Cincinnati Museum of Natural History excavations.
Figure 6.24: Results of magnetic susceptibility survey, 60-90cm below surface. Higher values indicate anthropogenic disturbance. Black areas indicate Cincinnati Museum of Natural History excavations.
Figure 6.25: All artifacts recovered from the systematic bucket auger survey
Figure 6.26: Hotspot analysis on material remains from the bucket auger survey
Figure 6.27: Shell tempered ceramics recovered from the systematic bucket auger survey.
Figure 6.28: Grit tempered ceramics recovered from the systematic bucket auger survey.
Figure 6.29: Comparison of Shell and Grit tempered ceramics recovered from the systematic bucket auger survey.
Figure 6.30: Limestone tempered ceramics recovered from the systematic bucket auger survey.
CHAPTER 6 TABLES

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Table 6.2: Radiometric Dates from Turpin. **Dates removed from calibration.
Chapter 7: Excavation Methodology and Results

House Block Excavation Methodology

In order to address questions regarding where people lived at Turpin in the past, excavation of potential structures is necessary. Based on the site structure findings presented in Chapter 6, two excavations blocks were positioned over likely habitation areas (Figure 7.1). House Block 1 was placed over an anomaly in the western portion of Locus 1. The magnetic signature of this anomaly is similar to those of burned structures at the Guard site in Indiana (Cook et al. 2015). Additionally, the western portion of Fort Ancient villages has consistently proven to be atypical (Cook 2008; Cook et al. 2015). A 10x7 meter excavation block was placed over the outer extents of the anomaly with the goal of investigating this structure. House Block 2 was the name given to investigations of one of four to five patterned magnetic anomalies in the eastern portion of the landform (Locus 2). These anomalies were larger and less distinct than those in Locus 1, and thus the anomaly under investigation was not exposed in its entirety. The northernmost anomaly, which produced the clearest magnetic results, was targeted with a 1x10m N-S excavation trench with the goal of determining the nature of prehistoric activity here and intercepting two walls if the anomaly reflects a prehistoric structure. This area was given less attention than Locus 1 because there was a higher chance that this anomaly in Locus 2 might not represent a structure.

House Block 1

House Block 1 was excavated in two stages. First, a 10x7 meter block was designated over the magnetic anomaly in question, from which the top 30cm of historic plow disturbance was removed without screening for time considerations. Once the entire block was excavated to 30cm below surface level, it was cleaned and mapped. Following this, two trenches were designed in a cruciform pattern in order to encounter all four
walls of the probable structure (Figure 7.2). The E-W trench was composed of 10 1x1m units. The N-S trench was composed of six 1x1m units. These dimensions reflect the size and shape of the magnetic anomaly, including the less magnetic interior and the highly magnetic exterior. Below 30cmbs, each of the 16 1x1m units was excavated in 10cm arbitrary levels until natural boundaries were encountered. Each unit was photographed and mapped at the base of each level. Soil was screened through standard 1/4 inch mesh. Five-liter flotation samples were taken from each level. Rock (both fire-cracked igneous and limestone) was weighed in the field for each unit-level and replaced in the house block upon backfill. Features were numbered starting at one and go through 78.

House Block 2

House Block 2 was excavated in two stages. First, a 1x10m N-S trench was placed over the magnetic anomaly in question (Figure 7.3). The top 30cm of plowzone was removed without screening because of time constraints. At the base of this level, the trench was cleaned, mapped, and photographed. Below 30cmbs, each of the 10 1x1m units was excavated in 10cm arbitrary levels until natural boundaries were encountered. Each unit was photographed and mapped at the base of each level. Soil was screened through standard 1/4 inch mesh. Five-liter flotation samples were taken from each level. Fire-cracked rock (both igneous and limestone) was weighed in the field for each unit and replaced in the trench upon backfill. Features were numbered starting at 100, so as not to conflict with concurrent excavations in House Block 1 and range through 168.

Material Analysis

Based on similar excavations at the nearby Guard site (Cook et al. 2015; Cook et al. n.d.), it was expected that each House Block would produce significant amounts of material culture. Categories include ceramics, stone tools and production debris, faunal remains, botanical remains, mussel shell, and daub. Depth of analysis differs for each category based on how they can address the research questions of this project. Ceramics are examined in the most detail, as they can provide evidence regarding time period (temper), cultural affiliation (design, vessel shape), and foodways (vessel types). Lithics are examined primarily based on formal tools, as diagnostic projectile point forms are
thought to link to cultural affiliation (e.g., Justice 1987). Botanical remains from select contexts are analyzed by Andrew Weiland, PhD candidate at Ohio State University as part of my NSF project (Grant #: 1545138). Cores and production debris, faunal remains and mussel shell are weighed by unit level in order to understand the nature of house basin infilling.

Ceramics

Analysis of ceramic remains focuses on temper type, surface treatment, vessel forms and stylistic motifs. Temper is considered temporally sensitive in the Middle Ohio Valley (Cook and Fargher 2008; Riggs 1998). It is unclear whether the distinction between grit and limestone was a meaningful one for prehistoric potters or merely a categorical distinction in the mind of archaeologists (e.g., Clay and Creasman 1999). Shell temper appears to represent a meaningful distinction both prehistorically and analytically (Cook and Fargher 2008) and as such presence of shell warrants its own category. Temper type will be recorded as primarily limestone, primarily grit, or primarily shell.

Body sherds represent the most basic and least used category of ceramic artifacts. Analysis of ceramic body sherds focuses on temper and surface treatment. Surface treatment is categorized as cord-marked, plain/smoothed, or other. Additionally, the average size of body sherds is tabulated in addition to density within each unit. This basic value may provide a useful indicator of disposal practices. Rim sherds are analyzed using standard methods for this region. First, each rim is categorized based on temper (shell/grit/limestone), surface treatment (cord-marked or plain/smoothed), decoration (undecorated/decorated), decoration type, and vessel type (jar, bowl, plate, or other) to create meaningful categories for comparison. Rim diameter will be measured in order to generate size categories of ceramic vessels. Differences in vessel size in different components or areas of a site can provide insight into prehistoric behavior (e.g., Blitz 1993). Additionally, rims are analyzed for a number of categorical traits (rim flare, lip shape, rim fold presence, rim decoration) and metric variables (rim thickness, body thickness below rim, rim fold height and thickness) following Turnbow and Henderson (1992). Necks, which are typically the decorated element of ceramics in this region, are
analyzed based on temper, surface treatment, the presence of decoration (plain vs. decorated), and what type of decoration is evident. Fort Ancient ceramics are typically decorated using some combination of incising (typically guilloche or chevrons), punctating, or painting (positive or negative). Details of design options are recorded for each neck. Design may be roughly temporally diagnostic (e.g., Turnbow and Henderson 1992), although direct dating of sherds is required to determine this with any level of certainty.

Lithics

Stone artifacts are divided into three categories for subsequent analysis: formal tools, cores, and debitage. Formal tools, which during this time period are generally projectile points, will be categorized using chronologically sensitive regional typologies (e.g., Cook and Comstock 2014; Justice 1987; Railey 1992). These typologies allow for a coarse understanding of time and cultural affiliation of deposits. Debitage analysis provides an understanding of the organization and production of lithic technology at a site. Understanding changes in lithic patterning between Late Woodland and Fort Ancient people will generate a more thorough understanding of changes in the organization of technology associate with the transition to agriculture.

Raw materials are determined for formal tools based on available comparative collections as well as published reference collections (Cantin 2008; DeRegnaucourt and Georgiady 1998). Because of significant overlap between some chert sources in the Midwest, in addition to significant movement of lithic material by glaciers, these designations are preliminary. Those chert types which can be confidently identified will be used to trace geographic connections and create local and non-local categories for subsequent analyses. Because of time constraints, cores and debitage are sorted, counted and weighed. Further analysis will take place in the future. Other stone tools, such as ground stone and other worked stone are categorized and described. Examples of non-chipped stone artifacts typically recovered from sites in this region include hammerstones, celts, nutting stones, net weights, spokeshaves, sharpening stones, stone discs, chunky stones (discoidals), and pipes.
Floral and Faunal Remains

Similar to the analysis of faunal material, the analysis of paleoethnobotanical remains will focus on general type of plant, spatial distribution, and ubiquity. For each 10cm level of each excavated context (excluding plow-zone), a five-liter floatation sample was collected. Select samples were processed and identified by Andrew Weiland, PhD candidate at Ohio State University. Heavy fraction materials were collected and will be processed similar to other materials as time allows. Organic remains are separated into wood charcoal, maize, seeds, and nutshell. Of key interest are spatial differences in the presence of maize and Eastern Agricultural Complex (EAC) crops.

Because of time constraints and the relative lack of comparative data they can provide the present study, faunal remains are weighed by context in order to examine spatial differences in bone density. Future work will focus on species differentiation and a detailed analysis of white-tailed deer remains.

Excavation Results - House Block 1

A total of 16 1x1m units were excavated in order to explore the magnetic anomaly in House Block 1. The anomaly was accurately predicted to be a prehistoric house, although when exposed at 30cm below surface level, it was clear that the structure was smaller than the geophysical anomaly pattern (Figure 7.4) Excavation of the two cruciform trenches to the house floor at approximately 70cm below surface revealed four wall trenches and numerous internal features (Figures 7.5 and 7.6). Outside of the structure, a separate, distinct midden was encountered that appears to be primarily Late Woodland in origin, with some Fort Ancient material mixed in. Findings from House 1 and midden contexts are considered separately. Findings are detailed below in terms of architectural remains, material culture, and AMS dates. A summary and interpretation follows.

Architecture

Wall Trenches

The magnetic anomaly labeled House Block 1 was explored using a cruciform trench pattern in order to investigate all four walls. At each edge of this anomaly, a
section of a wall trench was encountered and excavated separate from interior house fill (Figures 7.6 and 7.7). The northern wall trench (Feature 3), was approximately 40cm wide and 10cm deep and contained five large and two small postmolds. The density of posts compared to other trenches suggests that the wall may have been rebuilt in place at least once. The western wall trench (Feature 6), was between 25 and 30cm wide and 10cm deep and contained three evenly spaced postmolds, which averaged a depth of 33cm. The southern wall trench (Feature 4) was between 30 and 50cm wide and approximately 10cm deep and contained two large, two medium-sized, and two small posts. This trench also has what appears to be a secondary retention log trench on the interior-side of the wall, which may reflect renovation of the wall. The eastern wall trench (Feature 5), on what is presumed to be the door/plaza-facing wall, turned out to be a double wall trench. The first trench discovered was small (15-25cm wide), with two small posts and a potential retention log trench. After final cleanup of the area immediate inside this wall, a secondary wall trench (Feature 69) was discovered, which was considerably larger (approximately 30cm wide), but covered in places with what appears to be a rejuvenated clay floor. This trench contained three large posts, along with at least ten additional smaller posts, some of which overlap, suggesting renovation of this wall in place at some point. This trench was bisected length-wise to confirm that it was a wall trench segment, and provides an example of a typical wall trench in profile (Figures 7.8 and 7.9).

In Feature 25, a large post in the southern wall trench (Feature 4), a canid skull was encountered (Figure 7.10). Upon excavation, it appears as though this skull was placed within the post hole after the wall had been removed. Initial thoughts were that this dog could have been sacrificed and had its head placed in the post. Examination by Paul Sciulli of Ohio State University found evidence of blunt force trauma on the top of the skull and cuts along the first vertebra and along the mid-face, confirming that the dog was sacrificed. Considering these lines of evidence, it appears as though this canid was placed in a wall trench as a closing ceremony or ritual. Such dog ritualism was common among Mississippian and Fort Ancient societies (Cook 2012).
**Internal Posts**

A total of 31 internal posts were identified and confirmed via excavation in House 1. It is perhaps most useful to differentiate these posts in terms of size and depth. In order to do so, posts were mapped based on volume, which was approximated with the formula for the volume of a cone (Figure 7.11). The distribution of posts is not particularly informative, although one potential pattern is evident. The deepest internal posts were located along the north, west, and south walls; shallower posts were located centrally and near the eastern wall. This pattern strengthens interpretations based on refuse disposal that the eastern wall most likely contained the structure entrance.

**Internal Features**

Three non-post features were identified inside House 1. The first (Feature 30) represents the remains of an earlier pit that was cut into by the western wall trench. Judging from the artifacts recovered from this pit, including high-quality cherts and a quartz flake, along with notably different bone preservation and soil composition than that inside of the structure, this pit is interpreted as an earlier feature that was incidentally encountered when House 1 was constructed. The second internal feature represents the remains of a puddled clay hearth (Feature 7; Figure 7.12). These subterranean reinforced hearths occur at some sites in the region (e.g., Hielman et al. 1988; Vickery et al. 2000) and beyond (e.g., Lewis and Kneberg 1946), although they are generally an uncommon method of hearth preparation in the Middle Ohio Valley. The third feature (unnumbered) was a large clay/silt deposit at the center of the house (see Figure 7.13). This was interpreted as a second floor that was placed in the basin of the house during one of the rejuvenation episodes. This area was composed of a comparatively yellow clayey soil and contained a small number of artifacts.

**External Features**

The primary feature encountered outside of House 1 was a dense, organic (10YR2/1) midden (see Figure 7.7). This midden extended approximately 20cm below the plowzone (50cmbs). The first level (30-40cmbs) was composed of mixed Fort Ancient and Late Woodland ceramic materials. The second level (40-50cmbs) was
composed predominately of Late Woodland material. This suggests that the Fort Ancient basin structure was excavated into a preexisting Late Woodland sheet midden; this process could result in the strong magnetic halos around potential structures in the western community. Alternatively, this could reflect an intentional building up of material in a berm against the outside of the structure (e.g., Alt and Pauketat 2011).

At the top of this midden, just below the plowzone interface, the top of an adult human cranium was discovered (see Figure 7.5). Excavation was halted in this area and the remains were reburied. The affiliation of this individual is unclear, but considering its proximity to House 1, the burial may be related to this occupation.

**Material Culture**

House 1 produced significant amounts of material culture. A total of 60.78 kg of artifacts and 40.52 kg of ecofacts were recovered. The distribution of artifacts in units provides information on the depositional history of this structure (Figure 7.14). The majority of artifacts were recovered from Units 4 and 13, which are against the western and southern walls, respectively. This suggests that the walls may have been standing while the structure basin was filled with midden. These walls may have acted to create deposits of material thrown from an entryway, which I argue is on the eastern side of the structure.

**Ceramic Body Sherds**

A total of 56,498.14 g of ceramic body sherds (n=10,794) was recovered from House Block 1 excavations. Of this, 53,416.21 g (n=9,918) were within the structure, while 3,081.93 g (n=876) were recovered from a midden accumulation outside of the structure. Findings will be discussed in more detail in regard to temper type, which has general cultural/temporal significance (Cook and Fargher 2008; Riggs 1998; Seeman and Dancey 2000), surface treatment, and rim and neck characteristics, which can be important in parsing out affiliation.

Inside the structure, 98.9% (n=8,042) of ceramic body sherds were tempered with crushed mussel shell (Figures 7.15 and 7.16). Outside the structure, the proportion changes; the majority (72.1%; n=686) of ceramics recovered from this context are rock-
tempered. This suggests that the activities or groups that produced the midden assemblages located inside and outside of House 1 were temporally and/or culturally distinct. The external midden likely reflects a mixed deposit of older (Late Woodland; cord-marked, rock-tempered) and more recent Fort Ancient (shell-temper, primarily plain) refuse, mixed by later Fort Ancient activities like house basin excavation and house construction. This is supported by the fact that in general, rock tempered ceramics become more prevalent with depth (Figure 7.17).

In terms of surface treatment, the majority of body sherds recovered from inside House 1 are plain (81.38%), while the remainder are cord-marked (18.62%) (Figure 7.18). Outside of the structure, most sherds were cord-marked (87.38%), while a small number were plain (12.62%). Much like the differences in temper noted above, the differences in surface treatment strongly point to different origins of the assemblages inside and outside the structure. Another line of evidence that supports this trend is the average size of body sherds by context. Sherds from within House 1 are larger in general than those from outside of the house (Figure 7.19), suggesting that each contexts reflects the result of different depositional histories.

Ceramic Rims and Necks

Rims and necks play an important role in ceramic analysis in this region (e.g., Cook et al. 2015; Turnbow 1988; Turnbow and Henderson 1992). These artifacts will be characterized in terms of descriptive and metric variables. Following this descriptive overview, comparisons will be made between the House 1 assemblage and ceramics in the midden outside House 1. Tables including indeterminate data are found in Appendix B. Data presented in this chapter include only rims and necks which exhibited determinable traits. Characteristic examples of ceramic types discussed below can be found in Figure 7.20.

Of the 390 rim sherds for which vessel type could be determined, the majority (n=336; 86.15%) are jars (Table 7.1). Bowls represent the next most abundant vessel form (n=47; 12.05%), with short-necked jars (n=6; 1.54%) and one possible plate (0.26%) constituting the remainder. Most of these vessels had plain surfaces (n=307; 79.52%), with cordmarking (n=75; 19.43%) relatively uncommon (Table 7.2). Four
sherds (1.04%) were fabric impressed. The dominant material used to temper these vessels was a mixture of shell and grit (n=238; 51.6%), although solely shell-tempered vessels were also common (n=161; 34.9%). Less frequent were grit (n=35; 7.6%), mostly grit with some shell (n=17; 3.7%), sand (n=6; 1.3%) and a shell/grog mixture (n=4; 0.9%). Considered more simply, 420 sherds (91.1%) were tempered with some form of crushed mussel shell, 35 (7.6%) were tempered with crushed rock, and 6 (1.3%) were tempered with sand or contained no evident temper.

In terms of form, most rims were slightly flared (n=241; 62.76%). The remainder were straight (n=66; 17.19%), flared (n=38; 9.90%), or slightly incurvate (n=35; 9.11%). Only four rims (1.04%) could be classified as incurvate. Lip form was typically rounded (n=172; 38.83%) or flat/rounded (n=96; 21.67), although narrow/pointed (n=81; 18.28%) and flat (n=70; 15.80%) forms were also common. A small number (24; 5.42%) were a sloped form classified as flat/pointed. Rims were rarely decorated (n=30; 6.93%) and rim folds were uncommon (n=102; 23.50%).

In order to consider rim dimensions, only those rims that were three or more percent complete were selected. The mean diameter of vessels from House Block 1 is 25.70 cm. Jars averaged 27.22 cm while bowls averaged 13.79 cm (Figure 7.21). The average thickness of these vessels is 8.52 mm. Jar rims were 9.01 mm thick while bowl rims were 6.94 mm thick. The average thickness of vessels below the rim was 6.90 mm. Thickness below the rim of jars was 7.19 mm while that of bowls was 6.37 mm.

Sections of seven appendages were recovered; appendage type could be identified for four. All four appendages are strap handles; two are straight sided and two are V-shaped. Of these four, three handles were complete enough to gather metric data. The average length of these handles was 59.67 mm. The average widths at base, midpoint, and maximum width are: 31.51 mm, 37.20 mm, and 56.13 mm, respectively.

A total of 148 decorated neck sherds were recovered and analyzed. The majority of these sherds had plain/smoothed surfaces (n=129; 87.2%), with cordmarking (n=15; 10.1%) and other (n=4; 2.7%) constituting the remainder (Table 7.2). Most sherds were tempered with a mixture of shell and rock (n=91; 61.5%) or shell (n=50; 33.8%), with smaller numbers tempered with grit (n=4; 2.7%) or a shell/grog mixture (n=3; 2.0%).
Considered more simply, most neck sherds were tempered with crushed shell (n=144; 97.3%) and very few were tempered with crushed rock (n=4; 2.7%).

Consideration of vessel design requires the addition of rim and neck data, which results in 174 designed sherds from House Block 1 (Table 7.3). Many of these sherds were incised with an indeterminate design (n=51; 29.31%). Of those where design could be identified, the dominate categories were curvilinear guilloche (n=58; 33.33%) and possible painted sherds (n=44; 25.29%). With the exception of sherds with Ramey-like designs (n=4; 2.30%), no other design category had more than 3 sherds (1.72%).

Combining data from rims and necks allows for more complete consideration of surface treatment and temper. Of the 534 sherds in this combined sample, the majority have plain (n=436; 81.65%) or cordmarked (n=90; 16.85%) surfaces. The remainder reflect vessels with plain necks but are cordmarked below the shoulder (n=3; 0.56%) or were potentially stamped (n=5; 0.94%). The majority of sherds were tempered with a mixture of crushed shell and rock (n=329; 54.02%) or plain shell (n=211; 34.65%). The remainder were tempered with grit (n=39; 6.40%), a grit/shell mixture (n=17; 2.79%), a shell/grog mixture (n=7; 1.15%), or sand (n=6; 0.99%). Considered more simply, most rims and necks were tempered with shell (93%), with the rest tempered with rock (n=39; 6.40%) or sand (n=7; 0.99%).

Examining combined surface treatment and temper data are more informative and allow findings to be considered in regard to regional types (i.e. Mississippi Plain). House Block 1 rims and necks are predominately plain and shell-tempered (n=420; 83.33%) or cordmarked and shell-tempered (n=64; 12.70%). The remainder of sherds are rock tempered cordmarked (n=10; 1.98%) or plain (n=5; 0.99%). Five sherds (0.99%) were classified as shell-tempered with potentially stamped surfaces.

**Ceramic Rims and Necks - House 1 vs. Midden**

Comparing ceramics from House 1 and the midden outside of this structure provides potential insights into differences between Late Woodland and Fort Ancient vessels. However, the exterior of House 1 likely reflects a mixed midden, somewhat blurring the patterns of interest. Considering multiple lines of evidence point to the House
1 assemblage as almost all shell tempered, comparisons based on shell vs. rock tempered sherds will also be used to further elucidate meaningful differences.

As already noted for body sherds, there are differences between House 1 and the surrounding midden in regard to the material used to temper ceramics. Considering data from rim sherds, there are significantly more shell tempered rims in House 1 (n=411) than outside House 1 (n=9) and significantly more rock-tempered rims outside House 1 (n=22) than inside House 1 (n=13) \((X^2 = 187.578; p<0.001)\).

Comparing rim metrics between contexts can provide useful information regarding the size of vessels as well as general vessel construction techniques. For vessel diameter, only rims with greater than three percent completeness are used; for all other metrics, all rims are used. Rim diameter of jars is not significantly different between contexts \((t=1.367; p=0.173)\). Bowls cannot be compared between House 1 and the exterior midden because no bowls were recovered from the middle; all bowls recovered from House Block 1 excavations came from within House 1. Considering rim diameter of rock versus shell-tempered vessels from these contexts may help clarify Late Woodland and Fort Ancient differences. When comparing based on this criterion, the samples are statistically different \((t=-2.138; p=0.034)\). Rock tempered vessels are smaller (mean=14.50cm) than shell-tempered vessels (mean=25.38cm).

Vessel thickness was also significant different between vessels in House 1 and those in the surrounding midden. Maximum rim thickness was significantly smaller in exterior jars \((6.28\text{mm vs. } 8.69\text{mm})\) \((t=5.623; p<0.001)\). Similarly, thickness below the rim of jars was significantly lower in vessels recovered from outside House 1 \((5.75\text{mm vs. } 6.99\text{mm})\) \((t=3.160; p=0.002)\). These relationships hold when considering rock versus shell-tempered jars. Shell tempered rims are significantly thicker \((9.15\text{mm})\) than rock tempered sherds \((6.77\text{mm})\) \((F=14.672; p<0.001)\). Shell tempered jars are also thicker below the rim \((7.29\text{mm})\) than rock tempered sherds \((6.06\text{mm})\) \((F=8.244; p<0.001)\). Sand tempered jars have a low samples size \((n=4)\) so are not included in this comparison. These redundant findings suggest that interior/Fort Ancient vessels were thicker than exterior/Late Woodland vessels.

Vessel decoration cannot be statistically examined in a reliable fashion because all decorated sherds with the exception of three were recovered from House 1. House 1
produced 175 decorated sherds while the midden produced three. Rim folds were present only on rims from House 1 (n=102). Similarly, rims folds were only present on shell-tempered vessels (n=102).

To briefly summarize, the comparison between the outside of House 1/rock tempered ceramics and inside House 1/shell tempered ceramics produced a viable characterization of Late Woodland and Fort Ancient ceramics in this area, albeit based on a limited sample size. In general, Late Woodland vessels are thinner and tend to have smaller diameters. Additionally, these vessels are rarely decorated. Fort Ancient ceramics are thicker, have rim folds, and have larger diameters. These ceramic assemblages are notably different.

**Stone Tools and Debris**

A total of 34 stone tools were recovered from House Block 1 excavations (Figure 7.22). In addition, a total of 5,457.53g (n=4,056) of lithic debitage and 3,819.91g (n=171) or cores/core fragments were recovered. A total of 2,936 flakes weighing 4,215.59 grams were recovered from House 1, along with 138 cores or core fragments weighing 3,150.46 grams. A total of 1,042 flakes weighing 1,151.75 grams were recovered from the midden outside House 1, along with 32 cores or core fragments weighing 666.56 grams. In terms of the proportion of flakes and cores in each assemblage, House 1 and the surrounding midden are largely consistent. In House 1, 57% of the assemblage by weight was flakes; in the midden, 63% of the assemblage was flakes. Future work will address the differences in organization of technology between these components of the site, which is beyond the scope of the present study.

House 1 produced 26 stone tools. This includes one possible bladelet/lamellar flake, five biface fragments, two complete triangle points, eight triangle point fragments, four corner-notched points, two side-notched points, two biface preforms/production errors, and two drill fragments. The six triangular (or Madison) projectile points recovered from House 1 are consistent with early Fort Ancient forms.

The midden outside House 1 produced two biface fragments, one bifacial knife base, one possible bladelet, one expedient denticulate, one stemmed Woodland point, and two Jack's Reef pentagonal points. Of note, Jack's Reef points are a late Late Woodland
type (c. AD 750-1000) (Justice 1987) and are consistent with the interpretation that this midden reflects an earlier deposit than House 1. The possible bladelet and Woodland spear point may further indicate the mixed nature of this area, likely disturbed by prehistoric activities. This is consistent with the discovery of an earlier pit (Feature 30) within House 1 that was disturbed by the excavation of the original House 1 basin.

Five of the triangular projectile points recovered from House Block 1 can be assigned a type based on a regional typology (Cook and Comstock 2014; Railey 1992). Two Type 2 points (incurvate sides, excursive base), an early form, were recovered, along with two Type 5 points (straight sides, straight base), which are not chronologically sensitive in this region (Cook and Comstock 2014). An additional point appears to be a Type 6 (incurvate base), although the base appears to have been, making it difficult to confirm this late type.

Nine non-triangular points were also recovered from House Block 1. Two of these reflect the Jack’s Reef Pentagonal type (Figure 7.22:20-21) (Justice 1987), which are a late Late Woodland arrow point. Notably, these were each recovered from the midden outside House 1. The corner-notched points recovered from House Block 1 (Figure 7.22:16-19) cannot be easily assigned to a local typology. It is possible that these points reflect expedient arrow points and thus are not part of a typology. However, using the commonly cited reference text for projectile points in the midcontinent, these fit well with the Scallorn type (Justice 1987:220-222). Scallorn points are commonly found in the Central and Lower Mississippi Valley and as far west as Texas. They are believed to have been produced primarily between AD 700 and AD 1100. Alternatively, these points may reflect a type of small style of Archaic points.

Faunal Remains

The remains of butchered animals reflect a large proportion of the material recovered from House 1. Although these remains have not been analyzed in detail, cursory examination suggests that this context includes significant proportions of white-tailed deer and turkey, with smaller proportions of small mammals, reptiles, and fish. The distribution of faunal remains mirrors that of all artifacts in House 1 (Figure 7.23). Namely, the majority of remains (19,495g; 78.62%) came from within the structure and
in this context, Units 4 (3,527g; 18.09%) and 13 (3,471g; 17.80%) contained the densest amount of faunal remains. The exterior midden units contained 5,300g (21.37%) of faunal material in House Block 1.

Freshwater mussel represents a significant proportion of ecofacts recovered from Fort Ancient contexts at Turpin. Future examination will help to understand the different species represented and related them to a recent species richness study in the area (Genheimer and Hedeen 2014). The majority (13,509; 82.95%) of mussel shell was recovered from within House 1. The distribution of shell within House 1 mirrors that of faunal remains, suggesting that there were no distinct differences in deposition events between these types of materials. What is notable is the comparative lack of freshwater mussel shell in the midden outside of House 1 (2,776g; 17.04%), which suggests that this element of the diet was distinct to the inhabitants of this structure.

Floral Remains

Flotation samples were analyzed from nine contexts in House Block 1 with the goal of representing plant remains from both House 1 and the surrounding midden. The five contexts from within House 1 were Feature 30 (an earlier pit), Feature 7 (the puddled clay hearth), an ash dump feature in Unit 5 (60-70cmbs), Feature 24 (a post in the southern wall trench), and Feature 9 (a large post/pit). Outside of House 1, samples were taken from Unit 1 (30-40cmbs), Unit 11 (30-40cmbs), Unit 2 (40-50cmbs), Units 15 and 16 (all).

Results point to a generally low density of plant remains from within House 1 (Figure 7.24), with the exception of an ash feature encountered approximately 60-70cmbs. This feature produced one of the highest densities of maize (9.643/Liter) in this project, along with the highest densities of seeds (2.5/L) and nutshell (1.5/L) within House 1. Other contexts within House 1 contained low amounts (<1.2/L) of maize, seeds, and nutshell.

The midden outside of House 1 produced relatively high densities of maize, seeds, and nutshell on the southern (Unit 11) and western (Unit 1) sides of the house. Unit 11 produced nutshell at a density of 7.29/L, maize at 3.06/L, and EAC seeds at 1.88/L. Unit 1 produced nutshell at a density of 3.00/L, maize at 3.25/L, and EAC seeds at 3.00/L.
Notably, these samples were both from the higher levels (30-40cmbs) of the midden. The lower level (40-50cmbs) of Unit 2 on the western side and all samples from Units 15 and 16 on the northern side of House 1 produced low densities of organic remains.

One notable pattern is that despite overall low densities of organic remains, maize was ubiquitous in House Block 1 samples, pointing to the importance and abundance of this crop for the Fort Ancient occupants. This pattern of often low but ubiquitous maize mirrors findings from domestic and midden contexts at the Guard site in the lower Great Miami Valley (Cook et al. 2015).

**Bone and Shell Artifacts**

Twelve bone tools or examples of worked bone were recovered from House Block 1 (Figure 7.25). These include two bone awls and two potential bone awls or needles. The potential bone awls or needles are fish spines that may have been worked. Additionally, three hollowed antler tine tips that may reflect bone projectile points were recovered. Four of the worked bone artifacts are decorative. These include three worked canines, two of which came from a domestic dog, and one of which came from a wolf. Additionally, a drilled claw was recovered, which probably came from a large cat. Finally, one drilled deer phalanx tinkler was recovered from Feature 5, which is the exterior wall trench on the east side of House 1. With the exception of one bone awl, all were recovered from inside House 1. Additionally, fragments of four shell hoes were recovered (Figure 7.26). One was recovered from outside House 1, while the other three were recovered from inside the structure.

**Other Artifacts**

Seven additional artifacts of note were recovered from House Block 1 (Figure 7.27). This includes the remains of two stone pipe fragments, one of which is a platform pipe and one of which is an elbow pipe, and two clay pipe fragments. Additionally, a small shell bead was recovered. Two fragments of clay ear spools were also recovered. All of these artifacts were recovered from within House 1.
**Dates**

A total of six samples were taken from House Block 1 excavations for AMS dating at the University of Arizona NSF AMS Laboratory (*Figures 7.28 and 7.29; Table 7.4*). The sampling strategy focused on first gathering data from all elements of the excavation area, and second on generating a logical sequence of events so that one or more sequences could be made for Bayesian modeling. Samples were calibrated using OxCal 4.2.4 (Bronk Ramsey 2013) using the IntCal 13 Atmospheric Curve. First, calibrated dates will be provided with a discussion of their contexts. Then, using Bayesian modeling, potential sequences of house construction, renovation, occupation, and abandonment will be created. These sequences will then be used to refine chronological understanding of this house.

Three wood charcoal samples were taken from postmolds in House 1 in order to understand the architectural history of this structure. The first (AA107648), was taken from Feature 56, a postmold in the inner wall trench on the east side of the structure. This post dates between cal. AD 1040-1188, suggesting that this wall trench structure was built in the early Fort Ancient period. The second date (AA107647) was taken from Feature 12, a post in the outer wall trench on the east side of structure. This post dates between cal. 1181-1265, again suggesting an early Fort Ancient occupation, although later than the first construction episode. The third date (AA107650) was taken from a post in the northern wall trench. Because of a wiggle in the calibration curve, this post may date between AD 1049-1084 (19% probability) or AD 1125-1217 (74.5% probability). Although the latter is more likely, they both must be considered at the 2-sigma range. Both ranges put this northern wall trench in line with either the early or later post from the eastern wall trench. These three dates confirm two things. First, House 1 was a wall-trench structure built during the early Fort Ancient period. Second, considering the lack of overlap between the dates in the eastern wall trenches, the house was rebuilt at least once, confirming initial field interpretations.

A fourth date (AA107649) was taken from the puddled clay hearth (Feature 7) discovered at the center of the house. It is suspected that this date approximates the end of the structure's life, considering the hearth was likely used until the house was decommissioned. Because of a minor wiggle in the calibration curve, this feature dates
between AD 1054-1078 (4.6%); 1152-1250 (90.8%). Given the large probability, it is likely that the latter date more accurately reflects the timing of this hearth. This time period (AD 1152-1250) is consistent with the second episode of House 1’s occupation. This hearth was either cleaned out regularly (and thus a feature of the original house) or added during the second occupation.

The fifth date (AA107657) was taken from general fill within House 1. I have argued that the tremendous amount of trash within House 1 is more likely a result of a concerted effort to fill in the house basin with midden (either at once from surrounding areas or over time by a community). As such, this date should reflect either post-occupational deposition or refilling of the house basin with surrounding earlier trash. The carbon sampled from within the structure dates between AD 1045-1095 (14.1%) and 1120-1265 (81.1%). Unfortunately, the wiggle in the calibration curve again hampers understanding, although given what I have argued the latter date (ending at 1265) may more accurately reflect the timing of trash deposition in the House 1 basin.

The last date taken from House Block 1 (AA107657) was sampled from the midden outside of House 1. Given the above ceramic data it is expected that this could reflect either a Late Woodland or Fort Ancient context, considering I have argued that this deposit is mixed. Carbon from this context dated to AD 1031-1155, which is consistent with the early date from an interior post in the eastern wall trench. This may reflect the period in which House 1 was constructed, particularly if it was created using an earthen berm to support the walls, as suggested of some early Mississippian houses (Alt and Pauketat 2011).

**Comparing Dates**

Statistically comparing these dates in a pair-wise fashion (following Cook and Comstock 2015; Long and Rippeteau 1974; Shott 1992; Spaulding 1958; Ward and Wilson 1978) provides a more accurate understanding of House 1 chronology (Table 7.5). The major differences evident in this context stem from the post in the outer wall trench on the east side of House 1 (AA107647; 815±23). This post is significantly later than the inner post in the same wall (AA107648; 905±19), the wall trench post in the northern wall (AA107650; 881±19), and the exterior midden (AA107657; 938±20).
Additionally, the hearth (AA107649; 859±24) was significantly later than the exterior midden (AA107657; 938±20), and the northern wall trench post was later than the exterior midden. Although the last comparison is less intuitive, the preceding differences tell a consistent story. Contexts associated with the initial construction of the structure (the first wall trench and the exterior midden) are consistently earlier than the later contexts (the hearth and second wall trench). Oddly, the house fill was not statistically different from the exterior midden, two events which should be the latest and earliest, respectively. This may be a result of the large error range (44 years) on the house fill date (AA107651), or perhaps because the fill was redeposited midden. Overall, however, the results of this comparison strongly point to two occupations of House 1, one early (cal. AD 1030-1190) and one later (cal. AD 1180-1265).

Using Bayesian methods helps further narrow the chronology of House 1. Contexts from this excavation block were sampled in a way that a sequence of events could be produced. This sequence can be created using five events, as follows. First, the exterior midden, which I have argued was altered as a result of the construction of House 1, potentially as a berm against the walls of the house. Second, the post in the interior wall trench on the east side of House 1 reflects the initial construction of the house. Third, the post in the exterior wall trench on the east side of House 1, which should reflect the last construction even associated with this structure. Fourth, the puddled-clay hearth should reflect some of the last usage of the house by residents. Fifth, the interior fill of the house basin should reflect deposition that post-dates the structure.

Using this sequence, a tighter chronology can be produced (Figure 7.30; Table 7.6). Based on the statistical comparisons presented above, two phases were included. The first includes the exterior midden and the first building episode. This phase dates between AD 1038 and AD 1169. The second phase includes the second building episode, the hearth, and the basin fill. This phase dates between AD 1162 and AD 1250.

**Summary and Interpretation**

Upon investigation of House Block 1, the magnetic anomaly suspected to be a prehistoric structure represents the remains of an early Fort Ancient house, confidently dated between cal. AD 1040 and 1250. This house was constructed using Mississippian-
style wall trench architecture and was renovated in-place at least once, if not twice. The first occupation dates to AD 1040-1169 and the second dates to AD 1162-1250. After its use as a house, the basin prepared for this structure was filled in with trash. It is unclear at present if the origins of this detritus was the gradual accumulation of a nearby household or community, or if it reflects redeposited midden, moved from another area of the site. However, given the homogeneity of the ceramic assemblage, I would suggest that this deposit most likely reflects the accumulated trash of a nearby house or houses. This in-filling of the basin dates as late as AD 1120-1265.

Preliminary analysis of material culture is informative on a number of levels. First, the diet of the people who produced this assemblage is generally consistent with other Fort Ancient communities, meaning a focus on maize, deer, and turkey, supplemented with other small mammals. The exception is that these people also focused on riverine and lacustrine resources, a pattern which Smith (1978) suggests is atypical of Fort Ancient and more typical of Mississippian communities. Second, the ceramic assemblage from House 1 exhibits a high proportion of shell tempered undecorated plain/smoothed vessels. This is atypical of many Fort Ancient assemblages in this region, which often include high incidences of decoration (most commonly guilloche) and cordmarking in the entire vessel or below the shoulder (Cook 2008; Cowan 1987). The House 1 assemblage is more similar to everyday Mississippian contexts, which typically include a high proportion of Mississippi Plain-like jars, marked by undecorated necks and smooth bodies (Hilgeman 2000; McGill 2013). Third, based on differences in ceramics between the interior and exterior of the house, the house basin appears to have been excavated into a preexisting Late Woodland midden. Inside the structure, ceramics are primarily plain and shell tempered, while outside the structure, grit tempered cordmarked ceramics dominate. These two areas are also marked by differences in size. Shell tempered vessels are larger and thicker, while rock tempered vessels are smaller and thinner. This stark difference suggests that the structure was independent of Late Woodland occupation of the landform.

In summary, House 1 appears to be a Mississippian-style structure that was excavated into a Late Woodland midden. This structure was rebuilt in place at least once, if not twice, as evidenced by a secondary wall trench and what appears to be a
rejuvenated floor. Material culture recovered from this structure, whether it represents household or community midden, similarly points to a Mississippian house. Ceramics were predominately shell tempered (98.9%), and the majority of rims and necks reflect utilitarian Mississippian forms with few designs. Faunal remains, while exhibiting species typically targeted by Fort Ancient people, also included freshwater species more commonly found at Mississippian sites. Although preliminary, all lines of evidence point to House 1 as a house that would not be out of place anywhere in the Mississippian world. It is, however, unlike many Fort Ancient structures and assemblages at sites like SunWatch (Cook 2008) and Muir (Turnbow 1988).

**Excavation Results - House Block 2**

A total of 10 1x1m units were excavated in order to explore that magnetic anomaly in House Block 2. The anomaly was accurately predicted to be a prehistoric house, although much like House 1, when exposed it was smaller than the anomaly pattern (Figures 7.31 and 7.32). Immediately adjacent to the north edge of the structure, a large pit (Feature 100) was discovered. South of the structure a mixed midden deposit was discovered, below which was a Late Woodland pit filled with fire-cracked rock. Each of these contexts is considered separately. Findings are detailed below in terms of architectural remains, material culture, and AMS dates. A summary and interpretation follows.

**Architecture**

**Wall Trenches**

In the north end of House 2, three adjacent wall trenches were discovered (Figures 7.33 and 7.34). Features 122, 121, and 119 were vertically offset, with the interior most wall trench apparent at 100 cmbs, the central wall trench apparent at 85 cmbs, and the outside wall trench evident at 75 cmbs. Notably, the density of internal trench posts increases as one goes from the interior wall to the exterior wall. Feature 122 has two internal posts, each approximately 10cm deeper than the wall trench. Feature 121 has four internal posts, ranging from 12-28cm deeper than the wall trench. Feature 119 has five internal posts, ranging from 11-29cm deeper than the wall trench. This pattern
may point to rebuilding episodes; with each expansion, more posts were added to the wall trench, perhaps for added stability and longevity. On the south end of House 2, two partial wall trenches were discovered, although their nature is less clear than those on the north side of the house. These features may reflect an opening or entryway in this wall, facing the center of the proposed community.

**Interior Posts**

Four interior posts were identified at the base of House 2. Three of these posts were small (less than 10cm diameter) and one was approximately 20cm in diameter. Notably, three posts were located along the south wall of the structure. These are adjacent to the area that has been interpreted as an entrance. The large post was heavily chinked with rock and may reflect a stepping post like those suggested by Alt and Pauketat (2011) for wall trench structures in the central Mississippi Valley.

**Exterior Posts**

A total of 18 exterior posts were discovered outside of House 2. Sixteen posts are located south of the structure, while two were located north of the structure. There were likely more north of House 2, but Feature 100 obscured most evidence. Without exception posts south of House 2 were small, averaging 8.5cm in diameter and 8.8cm in depth. It is unclear whether these posts are related to House 2 occupations; they may be related to earlier Fort Ancient or Late Woodland occupation if the landform. One viable interpretation of the small posts near what may be an entrance in the southern wall trench is that they way reflect a windbreak or similar structure outside of the door. This would explain why Feature 128, the wall-trench on the southern end of the house, abruptly stopped part of the way across Unit 8. Additionally, the arc-shaped pattern is oriented against the west, which is the direction of prevailing winds (see Figure 7.31).

**Interior Features**

Two features were identified inside House 2 and appear to correspond with this structure. The first, Feature 118, is small a pit directly inside the north wall of the structure containing general fill consistent with that of the House 2 basin. The second
feature inside House 2 is a burned area in the center of the structure. Because of its central location and the nature of burned soil within it, this feature is interpreted as either a surface hearth, or a hearth that was removed in some way.

**Exterior Features**

Two external features were encountered while excavating House Block 2. The first (Feature 161), located directly south of House 2, was a pit evident at 70cmbs. The northeast quarter of this pit was sampled (Figure 7.35), producing Woodland-like ceramics, bone, and a large amount of FCR (~35kg). This pit is interpreted as a Late Woodland earth oven/trash pit and is likely unrelated to House 2, despite their spatial proximity. On top of this pit, a thin burned clay layer was encountered, which may reflect wall slump from the southern wall of House 2. This suggests that a depression, created by this earlier pit, existed at the time House 2 was inhabited, perhaps providing insight into the nature of 'open' areas of the Fort Ancient occupation of the landform.

The second external feature (Feature 100) was a large trash deposit filled primarily with ceramic and faunal material (Figure 7.36). Because of the density of material in this pit, as well as some of the atypical items that it produced, this feature became known in the field as the "party pit." Upon examination, the House Block 2 trench intersected a large pit or midden-filled swale just to the north of House 2. This was unexpected, considering the magnetic signature of this area was nondescript (i.e. not highly magnetic). This trash pit produced a surprisingly dense assemblage, including 34.58 kg of mussel shell, 16.44 kg of bone, 17.08 kg of ceramic body sherds, and 2.48 kg of lithic debris. Details of these materials are discussed below. Feature 100 was also notable for the less common artifacts it produced. This includes 8 shell hoes, 3 celt fragments, 2 bone flutes, and 1 discoidal/chunkey stone (a Mississippian gaming piece). More detailed comparisons will be made below, but this feature has a much higher incidence of decorated ceramics, both of local and non-local origin.

**Material Culture**

House Block 2 produced significant amounts of material culture. A total of 37.26kg of artifacts and 59.97kg of ecofacts were recovered. The distribution of artifacts
in units provides information on the depositional history of this structure (Figure 7.37). Specifically, the large pit (Feature 100) north of the structure contained a significantly higher density of artifacts than the House 2 Basin.

*Ceramic Body Sherds*

A total of 35,803.95g (n=8,722) ceramic body sherds were recovered from House Block 2 excavations. Approximately 36% of these (12,773.07g) came from within House 2, while 48% (17,081.77g) came from Feature 100, the pit north of House 1. The remaining 17% (5,949.11g) came from what appears to be general midden fill south of House 1. The material used to temper ceramics from House Block 2 was predominately shell (89.31%); 10.69% of body sherds were tempered with rock. This holds true throughout each of the three separate contexts identified in this excavation block (Figure 7.38). The ceramics recovered from Feature 100 were predominately tempered with shell (98.04%), which is the highest proportion in this excavation block. Inside House 2, 88.91% of ceramics were tempered with shell, with a slightly lower amount (80.97%) in the midden south of House 2.

The surface treatment of body sherds recovered from House Block 2 is split between plain/smoothed (50.86%) and cordmarking (49.14%). Almost all rock tempered sherds exhibited some kind of cord-marking. Considering only shell tempered ceramics, which are likely Fort Ancient in origin, may be more useful in eliciting trends. Inside House 2, shell tempered body sherds were predominately cordmarked (58.62%), representing the context with the highest proportion of shell tempered cord marked ceramics in this project (Figure 7.39). In the midden south of House 2, the proportion switches; a total of 57.65% of shell tempered body sherds exhibited plain surfaces. This pattern continues in Feature 100, in which 62.70% of shell tempered body sherds were plain. These patterns suggest that while Feature 100 and the midden south of House 2 were similar, in interior fill of House 2 was distinct in terms of its ceramic assemblage.

Consideration of the sizes of body sherds per context is informative, particularly when comparing sherds from within House 2 and those from Feature 100. Notably, Feature 100, despite having only 34% of total sherds by number, has over 56% of the total weight of sherds recovered from House Block 2 (Figure 7.40). Contexts within
House 2 account for half of the sherds by number, but just under 30% by weight. Put another way, sherds from within House 2 are the smallest from House Block 2; those from Feature 100 are the largest (Figure 7.41). This pattern suggests that Feature 100 reflects the primary deposition of materials, while House 2 may reflect the natural or cultural re-deposition of trampled midden.

*Ceramic Rims and Necks*

Analysis of rims and necks is an important aspect of understanding cultural differences in the Midcontinent. These artifacts will be characterized in terms of descriptive and metric variables. Following this descriptive overview, comparisons will be made between the House 2 assemblage, Feature 100 and ceramics in the midden south of House 2. Tables including indeterminate data are found in Appendix B. Data presented in this chapter include only rims and necks that exhibited determinable traits. Characteristic examples of ceramic types discussed below can be found in Figure 7.42.

A total of 399 rim sherds were recovered from House Block 2 for which it was possible to determine vessel type (Table 7.7). Jars dominate the assemblage (n=344; 86.22%), followed by bowls (n=48; 12.03%). A small number of short-necked jars (n=6; 1.50%) (see Hilgeman 2000) and a plate (n=1; 0.25%) constitute the remainder of identifiable vessel fragments. For rim sherds where neck surface treatment could be identified, plain/smoothed (n=284; 78.23%) and cordmarked (n=78; 21.49%) constitute the majority. One (0.28%) fabric impressed sherd was recovered. The material used to temper sherds was primarily a mixture of shell/grit (n=202; 43.7%), shell (n=175; 37.9%), grit (n=49; 10.6%), and grit/shell (n=28; 6.1%). A smaller number of sherds were tempered with sand (n=5; 1.1%) and a shell/grog mixture (n=3; 0.6%). Taken more simply, most rim sherds were tempered with shell (n=408; 88.3%), while a smaller number were tempered with rock (n=49; 10.6%) and sand (n=5; 1.1%) (Table 7.8).

Rim sherds that were large enough to determine the flare of the rim/neck section of the vessel totaled 399. The majority of vessels exhibited slightly flared profiles (n=272; 68.17%). The remainder exhibited either slightly incurvate (n=51; 12.78%), straight (n=47; 11.78%), flared (n=27; 6.77%), or incurvate (n=2; 0.50%) profiles. In terms of lip form, the majority of vessels exhibit rounded (n=151; 35.45%),
narrow/pointed (n=136; 31.92%), or flat (n=88; 20.66%) lip shapes. The rest exhibit flat/rounded (n=43; 10.09%) or flat/pointed (n=8; 1.88%) shapes.

In order to consider rim dimensions, only those rims that were three or more percent complete were selected. The mean diameter of vessels from House Block 2 is 23.94cm. Jars have an average diameter of 25.38cm, bowls had an average diameter of 18.77cm, and short-necked jars had a diameter of 14.25cm. The average vessel thickness at the rim is 8.37mm. Jars have an average rim thickness of 8.78mm, bowls have an average rim thickness of 6.86mm, and short-necked jars have an average rim thickness of 8.44mm. The average thickness of vessels below the rim is 6.53mm. Jars have an average below-rim thickness of 6.66mm, bowls have an average below-rim thickness of 6.16mm, and short-necked jars have an average below-rim thickness of 6.28.

A total of 16 handles or handle fragments were recovered from House Block 2, 15 of which are identifiable to a type. Of these, 11 are strap handles (9 v-shaped, 2 indeterminate), one is a pseudo-strap handle, two are strap/loop handles, and one is a tab handle. Of these, all except one were recovered from Feature 100; a V-strap handle was recovered from the midden south of House 2. No handles were recovered from within House 2. On average these handles were 65.40mm in length, 24.41mm wide at the base, 30.65mm wide at the midpoint, and had a maximum width of 50.24mm.

A total of 508 decorated sherds were recovered from House Block 2. Of these, the majority have plain/smoothed surfaces (n=417; 84.4%) and the rest have cordmarked surfaces (n=77; 15.6%). In terms of temper material, shell/grit (n=266; 52.26%) and shell (n=223; 43.90%) dominate. The remainder were tempered with grit/shell (n=8; 1.57%), shell/grog (n=6; 1.18%), grit (n=4; 0.79%) or sand (n=1; 0.20%). Considered more simply, shell was the overwhelming temper of choice (n=503; 99.02%), with very few sherds exhibiting solely rock (n=4; 0.79%) or sand (n=1; 0.20%) as a tempering material.

Consideration of vessel design requires the combination of rim and neck data, which results in 585 decorated sherds from House Block 2 (Table 7.9). Many of these designed sherds were small and can only be classified as 'indeterminate incised' (n=174; 29.74%). The majority of identifiable decorations were curvilinear guilloche (n=277; 47.35%). A number of other designs were identified, although most constituted a small proportion of all decorated sherds. The highest proportions were positive painted sherds
(n=35; 5.98%), line-filled triangles (n=22; 3.76%), and burnished sherds (n=14; 2.39%). Notably, a small number (n=4; 0.68%) of *Ramey-like* designs were also recovered.

Combining data from rims and necks also allows for a more complete consideration of surface treatment and temper. Of the 857 rim and neck sherds in this sample, the majority have plain/smoothed surfaces (n=701; 81.80%). With the exception of one (0.12%) fabric impressed sherd, the remainder have cordmarked surfaces (n=155; 18.09%). Most sherds in this sample were tempered with shell/grit (n=468; 48.25%) or shell (n=398; 41.03%). The remainder were tempered with grit (n=52; 5.46%), grit/shell (n=36; 3.71%), shell/grog (n=9; 0.93%), or sand (n=6; 0.62%). Considered more simply, shell was the overwhelming material of choice (n=911; 93.92%), while rock (n=53; 5.46%) and sand (n=6; 0.62%) constituted the remainder.

Examining combined surface treatment and temper data are more informative and allow findings to be considered in regard to regional types (i.e. Mississippi Plain). In House Block 2, the majority of sherds are shell tempered with plain/smoothed surfaces (n=684; 79.81%) or shell tempered with cordmarked surfaces (n=119; 13.89%). The remainder are rock tempered and cordmarked (n=35; 4.08%) or rock tempered with plain surfaces (n=13; 1.52%). Sand tempered sherds are extremely rare and exhibit both plain (n=4; 0.47%) and cordmarked (n=1; 0.12%) surfaces.

**Ceramic Rims and Necks - House 2 vs. F.100 vs. Midden**

Comparing ceramic assemblages from the three contexts encountered in House Block 2 can provide insight into differences between these areas. Assemblages will be compared based on temper, surface treatment, rim attributes, and rim metrics.

Although shell accounts for over 75% of temper in each of these three contexts, there is a significant difference between contexts ($X^2=16.651; p=0.002$). Feature 100 has a higher proportion of shell tempered sherds than either House 2 or the exterior midden. Conversely, the exterior midden has significantly more rock tempered ceramics than other contexts. House 2 is consistently between the other two contexts. When considering the surface treatment of neck sherds, there is a significant difference between the three contexts in question ($X^2=12.037; p=0.002$). Specifically, both Feature 100 and the exterior midden have high proportions of vessels with plain surfaces (89.6% and 84.8%,

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respectively). House 2 produced a lower number of plain sherds (77.7%), and a higher number of cordmarked sherds (22.3%).

Vessel diameter for all vessel types is not statistically different between contexts, although it approaches significance (F=2.764; p=0.065). There are significant differences once jars alone are considered (F=3.49; p=0.32). A Tukey Post-hoc Test of the ANOVA for jar diameter based on context suggests that the primary difference is between House 2 and Feature 100 (p=0.033). Jars from Feature 100 (mean = 25.66cm) are larger than those from House 2 (mean = 21.11cm) (Figure 7.43). There are no differences between the exterior midden and House 2 or Feature 100.

Rim thickness is statistically different between the three contexts in question (F=8.177; p<0.001). In this case, it is the exterior midden, which has a higher proportion of likely Late Woodland vessels, which stands out. Rims from this context are thinner (mean = 7.65mm) than both House 2 (mean = 8.68; p=0.073) and Feature 100 (mean = 9.24; p<0.001). Thickness below the rim (i.e. general vessel thickness) is not significantly different between contexts. Rim flare was significantly different between contexts (X²=15.63; p=0.048). The general pattern is that Feature 100 has more flared rims and fewer straight rims, while the exterior midden has more straight rims and fewer flared rims. House 2 is consistently intermediate in regard to rim flare proportion. Finally, there was a statistically significant difference in the proportion of vessels with rim folds (X²=21.455; p<0.001). Feature 100 has the highest incidence of rim folds (n=92; 41.6%), while both House 2 (n=35; 31.5%) and the exterior midden (n=14; 14.9%) have fewer.

Vessel decoration is statistically different between contexts (X²=79.281; p<0.001). Considering basic categories aside from indeterminate incised sherds, most differences are between House 2 and Feature 100. In particular, while the majority of curvilinear designs were recovered from Feature 100 (n=157; 63.56%), House 2 produced the highest proportion of angular incised sherds (n=26; 63.41%). Additionally, Feature 100 produced the highest proportion of painted (n=20; 55.56%) sherds and sherds with Ramey-like designs (n=3; 75.00%).

To briefly summarize, the comparison between House 2, Feature 100, and the exterior midden have identified patterned differences between these contexts. Vessels recovered from Feature 100 are larger in terms of vessel diameter and rim thickness, are
Vessels recovered from House 2 are smaller in vessel size and thickness, are the most likely to be cordmarked, have a higher incidence of grit temper, and are marked by a higher prevalence of rectilinear designs. The exterior midden is marked by relatively high incidences of straight necks, grit temper, and cordmarking. In many ways, it appears to reflect a mixed Late Woodland/Fort Ancient midden much like that outside House 1. Overall, although these contexts are similar when viewed generally, detailed examination revealed patterned variation which may reflect behavioral differences.

Lithics

A total of 6,221 flakes weighing 5,365.84 grams and 96 cores or core fragments weighing 1,318.49 grams were recovered from House Block 2. Of these, 2,548 flakes (2,154.74g) and 38 cores/fragments (512.29g) were recovered from House 2. Feature 100 produced 2,175 flakes (1,889.14g) and 39 cores/fragments (600.58), while the exterior midden south of House 2 produced 1,498 flakes (1321.96g) and 19 cores/fragments (205.62g). The proportions of flakes and cores in each assemblage are largely consistent; flakes constitute 75-85% of each assemblage. Future work will address the differences in organization of technology between these components of the site, which is beyond the scope of the present study.

A total of 80 stone tools were recovered from House Block 2 (Figures 7.44, 7.45, 7.46, and 7.47). House 2 produced 16 triangular point fragments, two drill fragments, one knife tip, one possible bladelet, four biface fragments, and two preforms/production errors. It is possible to assign ten of the triangle/biface fragments to a regional typology (Cook and Comstock 2014; Railey 1992). Of these, four are Type 2, an early form, and six are Type 5, which is not chronologically significant.

Feature 100 produced one complete triangle point, 12 triangle point fragments, one hafted flake, one weathered biface tip (likely Archaic), 12 preforms/production errors, seven biface fragments, one drill fragment, one scraper, one celt fragment, and one discoidal. Of the triangle and biface fragments, six were assignable to the regional typology noted above. Of these, four are Type 2, and 1 is a Type 5 triangular point. One
additional point was recovered that can either be classified as a Type 1 or Type 7. No other projectile points were recovered from Feature 100.

The exterior midden produced two triangle fragments, two preforms/production errors, and a sharpening stone. No triangle point fragments were complete enough to assign to a typology. Additionally, Feature 122 produced one triangle point fragment and one knife fragment. Feature 115 produced one celt fragment. Feature 126 produced one chipped stone disc. Features 119, 121, 122 produced one chipped stone disc and three celt fragments.

*Faunal Remains*

Animal bone reflects a large proportion of the material recovered from House 2. Although these remains have not been analyzed in detail, cursory examination suggests that this contexts includes significant proportions of white-tailed deer and turkey, with smaller proportions of small mammals, reptiles, and fish. The distribution of faunal remains mirrors that of all artifacts in House Block 2 (Figure 7.48). Namely, the majority of remains (12.22kg; 49%) came from Units 1-3, which reflect the large pit north of House 2. Faunal material from within House 2 accounts for 35% (8.83kg) of the total from House Block 2, while those from the midden south of House 2 account for 15% (3.88kg) of faunal remains. Notably, Feature 100 contains a significantly higher density of faunal remains than either House 2 or the southern midden.

Freshwater mussel represents a significant proportion of ecofacts recovered from Fort Ancient contexts at Turpin. Future examination will help to understand the different species represented and related them to a recent species richness study in the area (Genheimer and Hedeen 2014). The general distribution of shell within House 2 mirrors that of faunal remains, with a notable difference. Units 1-3, which contain Feature 100, have the highest amounts of mussel shell recovered in this study. These units contain 87% of the shell recovered from House Block 2. The proportion of shell to animal bone in these units is opposite from the remains in House 2, suggesting that mussels were a significant contributor to the event that produced the remains in Feature 100.
Floral Remains

Organic remains from seven contexts in House Block 2 were examined in detail, focusing on Feature 100 (n=3), House 2 (n=2) and the midden south of House 2 (n=2). Samples from Feature 100 were taken from Unit 2 (50-60cmbs), Unit 3 (50-60cmbs), and Feature 100 (70+cmbs). Samples from House 2 were taken from Unit 6 (60-70cmbs) and Feature 120 (a central burned feature/possible hearth). Samples from the external midden were taken from Unit 10 (50-60cmbs) and Unit 9 (beneath burned area).

Organic remains from Feature 100 are dominated by maize, which was recovered in a density of at least 5 specimens per Liter (5/L) in each context (Figure 7.49). Nutshell was recovered in lower amounts, with the exception of the lowest level (70+cm), where it was recovered at a density of 9.23/L. This may suggest that this pit was filled sequentially or as a result of different events. Seeds were recovered in low densities from each sample.

Within House 2, densities of seed, nutshell, and maize were all low (less than 2.5/L), making House 2 the least dense context in terms of plant remains. The midden south of House 2 exhibits the most unique signature. These contexts are dominated by EAC seeds, which are present in densities of 12.25/L and 28.00/L. This may reflect a primarily Woodland context, considering this is directly above Feature 161, which I have argued is a Late Woodland cooking and/or trash pit.

Much like House 1, maize was ubiquitous in all sampled contexts from House Block 2. This is not unexpected considering the importance of maize in early Fort Ancient diets (Cook and Schurr 2009). This pattern mirrors findings of ubiquitous maize at the Guard site in the lower Great Miami Valley (Cook et al. 2015).

Bone and Shell Artifacts

A total of 20 worked bone artifacts were recovered from House Block 2 excavations (Figure 7.50). Of these, 13 came from Feature 100. These include two bird bone flutes, one broken antler tine projectile point, three bone awls, one deer bone beamer, one deer phalanx tinkler, three incised mammal canines, and two worked antler tools. Six bone tools were recovered from House 2. These include one broken antler tine projectile point, two bone awls, one deer phalanx tinkler, and one large cut canine tooth,
possibly from a black bear. One piece of cut antler was recovered from the midden south of House 2. A total of nine shell hoes were recovered from House Block 2 (Figure 7.51). Notably, all of these artifacts were recovered from Units 1-3 and Feature 100.

Other Artifacts and Feature 100

Three additional artifacts of note were recovered from House Block 2 (Figure 7.52). These include a pottery ear spool fragment, which was recovered from Feature 100, and a shell tempered pottery ear plug and a shell disk bead that were recovered from within House 2.

Although described above in different sections, the non-quotidian artifacts recovered from Feature 100 are notable (Figure 7.53). This includes three celt fragments, a stone discoidal, a pottery ear plug, two bone flutes, a deer phalanx tinkler, and three incised canines. The nature of this assemblage stands in contrast to most other areas excavated as part of this project. These artifacts, along with the amount of ceramic and bone recovered from Feature 100, help strengthen the interpretation that this feature reflects the remains of a ritual ceremony.

Dates

A total of five samples were taken from House Block 2 excavations for AMS dating at the University of Arizona AMS Laboratory (Figures 7.54 and 7.55; Table 7.10). The sampling strategy focused on first gathering data from all elements of the excavation area and second, on generating a logical sequence of events so that one or more sequences could be made for Bayesian analysis. Samples were calibrated using OxCal 4.2.4 (Bronk Ramsey 2013) using the IntCal 13 Atmospheric Curve. First, calibrated dates will be provided with a discussion of their contexts. Then, using Bayesian modeling, potential sequence of house construction, renovation, occupation, and abandonment will be created. These sequences will then be used to refine chronological understanding of this house. It should be noted that two dates (AA107653 and AA107656) may have increased possibility of lab error5.

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5 The following quote is from the NSF University of Arizona AMS Laboratory:
They were all routine, except for samples 7 (AA107653) and 10 (AA107656). These were highly degraded - meaning that they tended to dissolve when exposed to sodium hydroxide. Well preserved charcoal is not attacked by base. It took a couple of rounds of pretreatment
Three samples were taken from postmolds in House 2 in order to help refine chronological understanding of this structure. The first (AA107654) was taken from Feature 158, a post in the inner wall-trench in the north wall of the house. This post dates between AD 1206 and AD 1270, suggesting a late-early Fort Ancient to early-middle Fort Ancient period construction date. The second (AA107652) was taken from Feature 154, a post in the outer wall-trench in the north wall of the house. This post dates between AD 1219 and AD 1270, much in line with the first. This suggests that the sequence of construction and renovation in this structure took place over 50-60 years.

The third (AA107653) was taken from a post in the southern wall trench. This sample may have been subject to increased lab error and had a larger error range as a result. It dates between AD 1039 and AD 1267, which is to say that it is consistent with the site as a whole, but does not provide much beyond that. It is, however, generally in line with the posts from the northern wall trench.

One sample (AA107655) was taken from Feature 100, the large pit north of House 2. This sample dates between AD 1223-1276, suggesting it was either contemporary with or perhaps post-dated the occupation of House 2. Considering this pit seems to have cut into the outer wall-trench, it is assumed that the pit itself (and associated activities) post-date House 2. This makes the activities associated with Feature 100 the latest confidently dated event identified in the present study.

The last sample (AA107656) may also have been subject to lab error. This sample was taken from the fill within House 2 and dates between AD 1246-1329 (62.2%) or 1341-1396 (33.2%). It is difficult to interpret this date because of the potential for error, but if the earlier probability (AD 1246-1329) is accurate, this could reflect the infilling of the House 2 basin. I have argued based on the low density of artifacts (compared to House 1) and small size and broken, exfoliated nature of ceramics from this context that this process, if intentional, likely resulted from shifting standing middens into the house basin. It is also possible that the basin was left relatively open and filled naturally.

chemistry, progressively more gentle, to recover any carbon. Both were 7 and 10 were small by the end of the preparation chemistry and graphitization, with sample 7 at the limit of our ability to measure (70 micrograms of carbon). Because of their small size, both were completely used up in the AMS machine before the full suite of 6 measurement rounds were completed. With fewer measurement cycles, our ability to define measurement precision was reduced, and you can see that effect in the larger errors of these measurements. At 70 micrograms, normally we would not report this date because contamination, always present, can become a significant portion of the measured carbon. However, because you sent a relatively large suite of samples, and the small samples fell within the range of the suite, we have reported them. It is possible that contamination did have an effect, but the larger uncertainty masked its effect by simply broadening the calibrated date range. Treat these two measurements with caution.
through floods (which sometimes reach the terrace level), re-depositing midden within the basin depression.

Comparing Dates

Comparing dates in a pair-wise fashion helps to refine the chronological understanding of House 2 (Table 7.11). However, many of the dates are more tightly clustered than those of House 1, supporting the idea that construction and renovation of this structure occurred within a narrow window of time. The only dates that are significantly different from one another are the inner wall trench in the northern wall (AA107654; 805±20) and the house fill (AA107656; 692±46), and the southern wall (AA107653; 855±63) and the house fill. This suggests that the initial construction of this structure occurred significantly earlier than the infilling of the house basin. The final construction event, the placement of the exterior third wall trench on the north side of the structure (AA107652; 788±19), approaches a significant difference, suggesting it to may have been earlier than the house fill. Chronological evidence supports archaeological interpretations that this basin was filled differently than that of House 1, and may have occurred incidentally by people or naturally via flooding.

Using Bayesian methods helps further narrow the chronology of House 2. Contexts from this excavation block were sampled in a way that a sequence of events could be produced. This sequence can be created using four events, as follows. First, the construction of the inner wall marks the initial construction of House 2. Second, the outer wall marks the last phase of construction of this house. Third, the edge of Feature 100 cuts into the outer wall of House 2, suggesting it happened after the last construction event. Finally, the fill of the House 2 basin is the last event that took place, whether intentional or natural.

Using this sequence, a tighter chronology can be produced (Figure 7.56; Table 7.12). Statistical examination of these dates suggests that one phase is appropriate. In this sequence, the inner trench in the north wall (AA107654) dates between AD 1214 and AD 1264, while the outer trench in the same wall (AA107652) dates between AD 1226 and AD 1269. Feature 100 (AA107655), which was created after House 2, dates to AD 1241 and AD 1279. The final fill episode (AA107656) dates between AD 1242-1320 (94.4%)
or AD 1366-1376 (1.0%). This analysis constrains dates slightly, particularly at the end of the occupation. It is unlikely that the fill episode dates much beyond AD 1300. Overall, these dates suggest that House 2 was occupied toward the end of the early Fort Ancient period.

House Block 2 Summary and Interpretation

Excavation of House Block 2 provided two distinct contexts which help to understand the nature of the eastern community at Turpin: House 2 and Feature 100. Each area appears to have been the result of different activities. These activities provide a more complete understanding of events at Turpin and allow for characterization of the eastern community at this site.

House 2 represents a Mississippian-style wall trench structure that was reconstructed in place at least twice and was occupied at some point between AD 1214 and AD 1269. Material remains from within the house basin are smaller and more worn than other contexts, suggesting that it was either filled with redeposited midden or these materials washed into an otherwise open house basin. The ceramic assemblage from House 2 is more variable than other contexts investigated in this study. It contains a mix of shell tempered vessels with plain and cordmarked surfaces, and many types of decoration are present. Although curvilinear guilloche is the most common motif, other angular designs such as rectilinear guilloche, chevrons, and line-filled triangles are present.

Feature 100 is a large pit dated between AD 1241 and AD 1279 that cut into that outer-most wall trench of House 2 and thus likely occurred after this house was abandoned. This pit was filled with filled with what may reflect the remains of a feast, as the artifacts recovered from this context include the remains of multiple deer, turkeys, and hundreds of mussel shells, along with Mississippian gaming pieces, bone flutes, and decorated ceramics. The ceramic assemblage from Feature 100 is dominated by shell tempered plain vessels, many of which are decorated. Decoration is almost invariably curvilinear guilloche, which is consistent with early and middle Fort Ancient assemblages in this region (Cowan 1987, 1990). This context may reflect a closing ceremony, as it reflects the latest date obtained from cultural contexts at Turpin.
Overall, excavations in House Block 2 have provided evidence of a later Fort Ancient community at Turpin when compared to House 1. Considering chronology and material culture, House 2 appears to be more consistent with Fort Ancient houses and communities in this region. Cowan (1987) suggested that ceramic assemblages during this period were more 'baroque,' which is consistent with the findings in House 2. Feature 100 may reflect rituals associated with the end of habitation at Turpin. Comparing these contexts with earlier occupation at Turpin identified in House 1 will provide fruitful diachronic patterns.

Comparing House Assemblages

In this section, findings from House 1 and House 2 are compared in order to provide insight into the Fort Ancient occupation of the landform. Until further work can be conducted, each house will act as a proxy for general trends in the community in which it is located. Findings from Feature 100 will also be used to help understand events in this area. Comparisons will be made in terms of chronology and material culture. The goals of this section are to (i) determine if the communities were contemporary, (ii) identify similarities or differences in ceramic design, and (iii) explore differences in processes of house abandonment. Because the house basins were filled with trash after people stopped living in them, particular domestic activities are unlikely to be identifiable.

Chronology

AMS dates from each context will be compared using pair-wise tests of contemporaneity, which examine the statistical probability of whether or not the events associated with calibrated dates were significantly different in time (see Cook and Comstock 2015; Shott 1992; Ward and Wilson 1978). Comparisons were completed in Calib v.6.1 (Stuiver and Reimer 1993). If dates are found to be significantly different, events are thought to have happened at different points in time. If they are found to be statistically comparable, then it is only possible to say that the events associated with each date may be contemporary. Although such comparisons are coarse given the range
of calibrated distributions, they provide a baseline for understanding the chronology of the communities in question.

**House 1 vs. House 2**

Comparing dated architectural elements between House 1 and House 2 suggest a complex sequence of site occupation (**Table 7.13**). The initial construction phase of House 1, as determined by the interior wall post on the east side (AA107648; 905±19) and the post in the northern wall trench (AA107650; 881±19), was significantly earlier than both the interior (AA107654; 805±20) and outer (AA107652; 788±19) wall trenches on the northern edge of House 2. The second phase of occupation at House 1, as determined by the outer wall trench on the east side (AA107647; 815±23), was not significantly different from either of the construction episodes of House 2.

Comparison of dated architectural features points to a sequence of Fort Ancient occupation of the landform. First, the construction of House 1 was the earliest event in this study, and suggests that the western community predated the eastern community. Second, House 1 was renovated and an additional wall was added. At the same time, House 2 was constructed, suggesting that the founding of the eastern community coincided with renovations with the western community. This may point to a small-scale fissioning event, likely linked to population growth of the original community. Interestingly, the material culture recovered from these house basins are notably different, particularly the ceramic assemblages. Comparisons of material culture are outlined below.

**Houses vs. Burials**

An important thing to consider when examining the timing of occupation of the landform is how habitation related to mortuary patterning evident at the site. Four burials have been dated from the Fort Ancient Mound (Cook 2014) (see **Table 7.14**). Three of these four were also subjected to strontium isotope analysis (Cook and Price 2015), and thus provide an additional line of comparative evidence. The first thing to note is that there was no early/late clustering of burials, suggesting that the entire time the landform
was occupied during the Fort Ancient period, burial events in the large earthen mound and surrounding pattern were occurring.

The second thing to note is the relationship between early dates and non-local individuals and later dates with local individuals. The early occupation (i.e. the inner wall trench of House 1) is the only date that is not statistically different from non-local individuals. This early date (AA107648; 905±15) is comparable to non-local individuals who may have come from Cahokia (AA100274; 923±45) and the Middle Cumberland region (AA100276; 983±46). All other architectural dates (the outer wall in House 1 and both walls in House 2) are statistically different from these strontium outliers. The inverse holds true. The inner wall in House 1 is statistically earlier than a burial with a local strontium signature (AA100277; 783±46), while all other architectural dates are statistically later than the non-local burials.

While the small sample sizes in this comparison do not permit definitive statements, the pattern identified here is worth consideration. What these comparisons suggest is that the first phase of occupation at Turpin coincides with first generation non-local burials. The second phase of occupation identified here is later than the burial of non-local individuals but contemporary with local burials. This fits well with the conclusion that the early occupation of the western locus reflects an intrusive Mississippian house.

Ceramics

Above, the ceramic assemblage from each context was characterized and compared internally. Findings suggest that within each community there were significant differences in ceramic production and style. Comparing assemblages between communities should highlight cultural and/or diachronic differences. As such, findings will be compared based on (i) House 1 vs. House 2, (ii) House 1 vs. House 2 vs. Feature 100, and (iii) rock vs. shell tempered ceramics, which, based on findings so far, should highlight differences between late Woodland and Fort Ancient ceramic production. In each comparison, body sherds will be briefly analyzed, followed by more detailed analysis of rim and neck attributes.
Comparing House 1 and House 2

Body Sherds

A total of 8,285 (53,416.21g) body sherds were recovered from House 1 while 4,369 (12,773.07g) body sherds were recovered from House 2. Because a different number of 1x1m units were excavated into House 1 (n=10) and House 2 (n=4), consideration of body sherds must be weighted accordingly. Taking this into account, a pattern becomes clear. House 1 had a higher volume of sherds by weight (5,341g/unit), but a lower volume of sherds by count (829/unit) than House 2 (Figure 7.57). House 2 had a lower volume of sherds by weight (3,193g/unit) and a higher sherd count (1,092/unit) by unit. This pattern suggests that House 1 had a smaller number of larger sherds while House 2 had a larger number of smaller sherds. Considering all excavated contexts, House 1 has the largest average body sherd size (6.45g) while House 2 had the smallest average sherd size (2.92g) (Figure 7.58). This finding fits well with the interpretation that the House 2 fill reflects redeposited midden while House 1 fill reflects the deposition of less worn artifacts.

The material used to temper ceramics from House 1 and House 2 was relatively consistent. The assemblage of body sherds from House 1 was almost all tempered with shell (98.94%), with a small amount of rock tempered sherds (1.06%). In House 2, a smaller, although still large, proportion of the assemblage was tempered with shell (88.91%) with the rest tempered with rock (11.09%). The increase in rock tempered sherds in House 2 may reflect an increase in rock-only tempering over time or midden fill mixed with Late Woodland (rock) and Fort Ancient (shell) pottery.

The most notable difference in the assemblages of body sherds from House 1 and House 2 is in terms of the surface treatment of vessels. In House 1, the majority of vessels have plain or smoothed surfaces (80.75%) as opposed to cordmarked (19.25%). In House 2, cordmarking is the dominant surface treatment (62.49%), while plain surfaces are more rare (37.51%). The stark difference between vessels from these two assemblages may reflect differences between a Mississippian house filled with Mississippi Plain utilitarian ceramics, and a more 'typical' Fort Ancient house, exhibiting the more hybrid 'Woodland' trait of cordmarking.
Rim Statistics

In order to compare rims statistics, vessels were analyzed separately as jars, bowls, or short-necked jars. For vessel diameter, only sherds that reflect three or more percent of the vessel rim were used. Three of the four metrics measured on identifiable jar rim sherds are significantly different between House 1 and House 2 (Table 7.15). Vessel diameter is larger in House 1 than House 2 (F=16.603; p<0.001). Jars from House 1 are larger (mean = 27.35cm) than those from House 2 (mean = 21.11cm). Rim thickness is also significantly different between houses (F=6.521; p=0.011). Jars from House 1 have thicker rims (mean = 9.14mm) than those from House 2 (mean = 8.51mm). Vessel thickness below the rim is also significantly different (F=4.348; p=0.038). Again jars from House 1 are thicker (mean = 7.26mm) than those from House 2 (mean = 6.82). Rim fold height is not statistically different between houses (F=0.56; p=0.456).

Characteristics for neither bowls nor short-necked jar metrics were significantly different between contexts. This may be a result of the small number of these vessel types (bowl n=12; short-necked jar n = 3) recovered from House 2.

Frequency attributes

Examination of frequency attributes between House 1 and House 2 focuses on vessel types, vessel construction, and vessel form and does not include indeterminate cases. There is no significant difference in the proportion of vessel forms between House 1 and House 2 (X² = 0.957; p=0.620). In each context, jars constitute approximately 85% of the assemblage, bowls make up about 12% and short-necked jars constitute less than three percent, and plates are less than one percent of the assemblage. The overall similarity in assemblage diversity between these contexts suggests that each reflects a suite of vessels used in everyday activities, which were deposited in midden contexts at a relatively similar rate.

Surface treatment is statically different by context when considering neck sherds (X² = 9.357; p=0.002). Necks from House 1 are primarily plain/smoothed (n=130; 90.3%), with a small incidence of cordmarking (n=14; 9.7%). Although the general trend is similar in House 2, about three quarters of necks are plain/smoothed (n=153; 77.7%) and about a quarter of necks are cordmarked (n=44; 22.3%). Considering simplified
temper materials evident in rim sherds, there is also a significant difference between House 1 and House 2 ($X^2 = 11.694; p=0.003$). While House 1 rims are predominately tempered with shell ($n=411; 95.6\%$), House 2 rims have a higher incidence of rock tempered sherds ($n=13; 10.3\%$). Although the proportions presented for surface treatment and temper material are generally comparable between House 1 and House 2, there are important differences. When considering these two aspects of vessel construction together, it is clear that House 1 produced more vessels that fall under that heading of Mississippi Plain. These plain, shell tempered vessels constitute $84.27\%$ ($n=418$) of the assemblage of House 1. House 2 has a lower frequency of these vessels ($n=219; 76.31\%$).

Neither rim flare ($X^2=3.46; p=0.484$) nor rim fold presence ($X^2=1.761; p=0.184$) are significantly different between House 1 and House 2 (Table 7.16). The lack of differences suggests that the general form of vessels was consistent between contexts. However, lip form was different between houses ($X^2=21.923; p<0.001$). Vessels from House 2 tend to have more flat or narrow/pointed lips while those from House 1 tend to have more flat/rounded or rounded forms. The presence of rim decoration was not significantly different between Houses 1 and 2 ($X^2=0.530; p=0.467$). In both cases, approximately eight percent of rims were decorated.

Neck decoration is different between contexts on a number of levels. When considering rim sherds for which neck decoration could be reliably assessed, vessels from House 1 are more frequently undecorated ($n=268; 90.8\%$) when compared to House 2 ($n=32; 55.2\%$), which has a higher incidence of incised necks ($n=23; 39.7\%$) ($X^2=53.94; p<0.001$). Despite a smaller number of excavated units, House 2 produced more decorated neck sherds ($n=207$) than House 1 ($n=145$), which speaks to the differences in degree of vessel decoration between these contexts. In terms of design types, there is a significant difference between House 1 and House 2 ($X^2=73.35; p<0.001$). While each context produced roughly the same proportion of curvilinear guilloche (34%), House 1 had a higher proportion of possible painted sherds ($n=46; 31.94\%$) and Ramey-like designs ($n=2; 1.39\%$). House 2 has a higher proportion of angular designs (i.e. rectilinear guilloche, chevrons, and line-filled triangles) (12.68%), punctated sherds (3.41%) and burnished sherds (2.44%). In general, the types and frequency of designs are higher in House 2.
In summary, Houses 1 and 2 have similar ceramic assemblages, although evident differences are significant. In particular, the assemblage from House 1 is dominated by large, plain, shell tempered vessels that are infrequently decorated. When decoration does occur it is typically either curvilinear guilloche or paint. Aside from the few decorated sherds, this assemblage is largely comparable to the Mississippi Plain ceramic type often recovered from Mississippian habitation contexts. The assemblage from House 2 is composed of smaller vessels that have relatively higher incidence of rock temper and cordmarking. Vessels are frequently decorated using incised designs like guilloche or line-filled triangles. In many ways, the assemblage from House 2 reflects the 'baroque' assemblages that Cowan (1987) described for Schomaker Phase villages in this region.

Comparing House Assemblages to Feature 100

Given the informative differences identified when comparing House 1 and House 2, it is appropriate to consider how Feature 100, which is either contemporary with or postdates House 2, fits into this picture. This pit feature has one of the highest densities of ceramic remains encountered at this site and thus represents a meaningful avenue of comparison to the midden deposits in the House 1 and 2 basins.

Vessel size, as determined from rim diameter, is significantly different between these three contexts (F=5.57; p=0.004). The primary difference lies between Houses 1 and 2, as discussed above, but the difference between Feature 100 and House 2 approaches significance (p=0.071). In this sense, the size of vessels of Feature 100 (mean = 23.85cm) falls between House 1 (mean = 25.31cm) and House 2 (mean = 20.10cm). Rim thickness is also different between contexts (F=3.470; p=0.032). Feature 100 produced the thickest rims (mean = 8.80mm) that are significantly larger than those of House 2 (mean = 8.15mm). House 2 rims are also significantly smaller (p=0.03) than those from House 1 (mean = 8.69mm) (p=0.55). There is no statistical difference between House 1 and Feature 100 (p=.826). In terms of vessel thickness below the rim, these contexts were also significantly different (F=5.97; p=0.003), although the primary difference here lies in House 1. Vessels from House 1 (mean = 6.99mm) are significantly thicker below the rim than those from Feature 100 (mean = 6.54mm; p=0.004) and the
difference approaches significance when compared with those from House 2 (mean = 6.60mm; p=0.084).

There is no difference in surface treatment between Houses 1 and 2 and Feature 100 ($X^2 = 3.402; p=0.493$). Each context exhibits approximately 20% cordmarking and 80% plain/smoothed surfaces. There is, however, a difference in temper material between contexts ($X^2 = 13.273; p=0.010$). In this case, Feature 100 is intermediate between Houses 1 and 2; 92.9% of vessels from this context were tempered with shell.

In terms of decoration, Feature 100 again falls between Houses 1 and 2; the difference between these three contexts is statistically significant ($X^2 = 56.67; p<0.001$). Considering rim sherds where decoration could be confidently determined, 73.1% of rim/neck sherds from Feature 100 are undecorated, which is intermediate between House 1 (90.8%) and House 2 (55.2%). The types of designs evident on neck sherds was also significantly different ($X^2 = 151.127; p<0.001$). Over 60% of identifiable designs on necks from Feature 100 are curvilinear guilloche, which is higher than both House 1 (34.7%) and House 2 (34.6%). Additionally, Feature 100 is intermediate between House 1 and House 2 in terms of painted sherds and Ramey-like designs (Table 7.17).

In summary, the ceramic assemblage from Feature 100 appears to reflect a middle ground or hybrid between House 1 and House 2. Such assemblage-level hybridity may reflect a combined ceremony attended by members of each small community examined here, the results of which were deposited in Feature 100. Vessels are as large as those from House 1, and are consistent in terms of vessel shape and construction with both house assemblages. Perhaps the most striking element of this assemblage is that while many rims/necks are plain, and are reminiscent of the Mississippi Plain type, those that are decorated are almost all curvilinear guilloche, a distinctly Fort Ancient design. In many ways it seems as though this assemblage reflects emerging homogeneity of vessel decoration. Its distinct difference from the variability of the House 2 fill assemblage may reflect more on the latter's potential as a mixed fill episode.

Comparing Late Woodland and Early Fort Ancient Ceramics

Excavation findings suggest that it is fair, at this site at least, to suggest that rock tempered ceramics are Late Woodland in origin while shell tempered ceramics are
associated with the Fort Ancient occupation. The small overlap in contexts appears to be a result of mixing related to Fort Ancient village construction. With this in mind, it is productive to examine metric and categorical differences in the assemblages of rock and shell tempered ceramics recovered in this project. It must be noted that findings may be influenced by sample size; a total of 20 rock tempered rims were recovered in this project, while 417 shell tempered rims were recovered. Findings are tentative, and examination of additional Late Woodland contexts at Turpin is necessary before anything definitive can be said, but initial patterns can be used to characterize these assemblages. The differences between these assemblages also support the overall idea of this project that the Fort Ancient occupation was largely unrelated to Late Woodland developments.

The most telling difference between rock and shell tempered ceramics is in size. Vessel diameter is significantly different between assemblages (F=21.408; p<0.001). Shell tempered vessels are consistently larger (mean = 24.50cm) than rock tempered vessels (mean = 14.15). Additionally, both rim thickness (F=98.35; p<0.001) and thickness below the rim (F=111.159; p<0.001) are significantly different between shell and rock tempered vessels. Shell tempered vessels are consistently thicker (8.71mm rim; 6.87mm below rim) than rock tempered vessels (6.31mm rim; 5.60mm below rim). These differences in vessel size likely points to different schematics for vessel construction between Late Woodland and Fort Ancient groups.

Significant differences also exist in the treatment of vessel exteriors. In terms of surface treatment (X²=168.00; p<0.001), approximately 80% of rock tempered rim sherds are cordmarked, while 85% of shell tempered sherds are plain. The only fabric impressed sherds are shell tempered (Table 7.18). The difference in decoration between rock and shell tempered rims approaches significance (X²=6.965; p=0.076). Rock tempered rim/neck sherds rarely exhibit neck decoration (n=2; 5.2%), while approximately 20% of shell tempered sherds are decorated.

Overall morphology is also different between rock and shell tempered vessels. Rim flare is distinctly different (X²=184.84; p<0.001). Rock tempered vessels have predominately straight necks (n=51; 65.4%), while shell tempered vessels tend to have slightly flared necks (n=492; 70.9%). Lip form is similarly different based on temper (X²=167.19; p<0.001). The shape of lips on rock tempered vessels is most commonly flat.
(n=58; 69.9%) while those of shell tempered vessels have a variety of forms (Table 7.19). An additional factor to consider is that while approximately one third of shell tempered rims exhibit rim folds, no rock tempered sherds have them.

To briefly summarize these results, shell tempered vessels have plain surfaces, are larger, have a higher incidence of flared necks and have rim folds. Rock tempered sherds are smaller, are predominately cordmarked, and have straight necks, and tend to have flat lips. Overall, it appears as though rock and shell tempered vessels recovered at Turpin originate from different traditions.

Chapter 7 Summary

In this chapter, excavation results of two wall trench houses from two prehistoric communities at Turpin were provided in order to provide an understanding of where, how, and when people lived at this site. In the western community, House 1 is a wall trench structure with two evident occupations, one between AD 1040 and AD 1188 and the second between AD 1162 and AD 1250. After its occupation had ended, it appears as though the walls were pulled and a dog was sacrificed and its head was commemoratively placed in a post hole. The house basin was then filled with trash. Ceramics recovered from this structure are almost all shell tempered with plain surfaces; decoration is infrequent but is typically either curvilinear guilloche or paint. In many ways, this assemblage is very similar to Mississippian ceramic assemblages throughout the Ohio Valley. In the eastern community, House 2 is a wall trench structure built between AD 1206 and AD 1270, overlapping with the second occupation of House 1. It appears as though after occupation had ended this basin was either left open or filled with trampled midden. Ceramics from this context are almost all shell tempered, but both plain and cordmarked surfaces are common. Decoration is frequent and highly variable, including many types of guilloche patterns and other incised designs. Intruding into the northernmost wall trench of House 2 was a later pit (c. AD 1241-1279) that was filled with faunal and ceramic remains. It also contained Mississippian artifacts and an array of artifacts not seen in similar density in other contexts. The ceramic assemblage of this pit appears to reflect a hybrid between that of House 1 and House 2. This pit, which is
stratigraphically later than House 2, may reflect a closing ceremony for this structure or this area of the community.

At this point, the differences between House 1 and House 2 are assumed to reflect overall differences between the western and eastern areas of occupation, respectively. Chronologically, the two communities present a complex sequence of occupation. The western community was occupied first, at some point between AD 1040 and 1188, and reoccupied between AD 1181 and AD 1265. The eastern community was occupied between AD 1206 and AD 1270. This is statistically later than the first occupation in the western community, but contemporary with its second occupation. This sequence has been tentatively interpreted as a small initial occupation in the western part of the landform, followed by renovation of the original community and a process of budding-off into a second community in the eastern part of the landform. Importantly, the first phase of this process corresponds with dated strontium outliers in the burial mound complex, while the second phase corresponds with dated burials with local strontium signatures.

The ceramic assemblages from House 1 and House 2 are generally similar, but exhibit distinct differences. Vessels from House 1 are predominately large, plain, shell-tempered jars with very little decoration. I have suggested that these vessels fit well with the classic Mississippi Plain ceramic type. Vessels from House 2 are smaller than those from House 1 and primarily shell tempered, but exhibit higher proportions of cordmarked surfaces and decoration. These vessels fit well with Cowan's (1987) description of the 'baroque' pottery decorations of the Schomaker (c. AD 1250-1400) phase. The transition between these two modes of pottery production and design represents an important finding in that it is now clear that early ceramics were more Mississippian, but over time designs emerged and became prevalent, reflecting more traditionally Fort Ancient styles.

Overall, examination of House 1 and House 2 has provided a firm chronological and cultural understanding of dynamics at Turpin. The early occupation is comparable to many Mississippian communities throughout the Midwest and Southeast. The later occupation is more typical of Fort Ancient settlement and ceramic assemblages in this region. Future examination of structures in these communities will help test these patterns.
Figure 7.1: House Block Magnetic Anomalies
Figure 7.2: House Block 1 Magnetic Anomaly and Excavation Grid
Figure 7.3: House Block 2 Magnetic Anomaly and Excavation Grid
Figure 7.4: Excavation of House Block 1 at 30cm below surface. Contrast increased to highlight structure edges.

Figure 7.5: House Block 1 Excavation Map
Figure 7.6: House 1 Excavation at floor level (~70cmbs).

Figure 7.7: North wall of House 1. Features from left to right: interior house fill, wall trench, exterior midden.
Figure 7.8: Profile view of internal wall trench (Feature 69) on the east side of House 1 (photo)

Figure 7.9: Profile view of internal wall trench (Feature 69) on the east side of House 1 (map)
Figure 7.10: Dog cranium in Feature 25, a postmold in the southern wall trench (Feature 4) of House 1.

Figure 7.11: Map of House 1 post volumes
Figure 7.12: Puddled clay hearth (Feature 7) in the center of House 1.

Figure 7.13: Yellow clay layer found just above House 1 floor. Feature interpreted as the remnant of a prepared floor.
Figure 7.14: Density of material remains from units in House Block 1

Figure 7.15: Percent shell and rock tempered ceramics in House Block 1.
Figure 7.16: Temper type for body sherds in House Block 1

Figure 7.17: Body sherd temper by level in units outside of House 1

Figure 7.18: Body sherd surface treatment in House Block 1
Figure 7.19: Sherd size (g) by context in House Block 1
Figure 7.20: selected ceramic sherds from House Block 1
Figure 7.21: House Block 1 Jar Rim Diameter by Context (≥3 percent complete)
Figure 7.22: House Block 1 stone tools

Unit, level, and context for each specimen:
1: Unit 6, 30-40 (House 1); 2: Unit 7, 30-40 (House 1); 3: Unit 8, 30-40 (House 1); 4: Unit 8, 40-50 (House 1); 5: Unit 9, 60-70 (House 1); 6: Unit 12, 30-40 (House 1); 7: Unit 7, 40-50 (House 1); 8: Unit 8, 40-50 (House 1); 9: Unit 7, 50-60 (House 1); 10: Unit 13, 50-60 (House 1); 11: Unit 4, 40-50 (House 1); 12: Unit 5, 50-60 (House 1); 13: Unit 14, 40-50 (House 1); 14: Unit 8, 30-40 (House 1); 15: Unit 7, 60-70 (House 1); 16: Unit 6, 30-40 (House 1); 17: Unit 4, 50-60 (House 1); 18: Unit 9, 30-40 (House 1); 19: Unit 13, 50-60 (House 1); 20: Unit 10, 40-50 (midden); 21: Unit 16, 30-40 (midden); 22: Unit 1, 30-40 (midden); 23: Unit 6, 30-40 (midden); 24: Unit 8, 50-60 (House 1); 25: Unit 2, 30-40 (midden); 26: Unit 2, 30-40 (midden); 27: Unit 3, 60-70 (House 1); 28: Unit 11, 40-50 (midden); 29: Unit 6, 40-50 (House 1); 30: Unit 7, 30-40 (House 1); 31: Unit 7, 30-40 (House 1); 32: Unit 4, 30-40 (House 1); 33: Unit 10, 30-40 (midden); 34: Unit 10, 30-40 (midden).
Figure 7.23: Faunal Remains in units from House Block 1. Top image is a west-east transect. Bottom image is a south-north transect.
Figure 7.24: Botanical Remains from sampled contexts in House Block 1.

Figure 7.25 House Block 1 bone tools and ornaments.

Unit, level, and context for each specimen: 1: Unit 7, 50-60 (House 1); 2: 9, 60-70 (House 1); 3: Unit 6, 50-60 (House 1); 4: Units 9+10, Feature 5 (House 1); 5: Unit 8, 50-60 (House 1); 6: Unit 13, 60-70 (House 1); 7: Unit 5, 30-40 (House 1); 8: Unit 9, 30-40 (House 1); 9: Unit 4, 30-40 (House 1); 10: Unit 4, 30-40 (House 1); 11: Unit 4, 30-40 (House 1); 12: Unit 7, 30-40 (House 1).
Figure 7.26: Shell hoes and fragments recovered from House Block 1

Unit, level, and context for each specimen:
1: Unit 13, 50-60 (House 1); 2: Unit 7, 40-50 (House 1); 3: Unit 13, 50-60 (House 1); 4: Unit 1, 60-70 (midden).

Figure 7.27: Other artifacts recovered from House Block 1.

Unit, level, and context for each specimen: 1: Unit 6, 40-50; 2: Unit 15, 50-60; 3: Unit 15, 30-40; 4: Unit 14: 30-40; 5: Unit 12, 30-40; 6: Unit 3: 30-40; 7: Unit 6, 60-70.
Figure 7.28 House Block 1 Date Contexts

Figure 7.29: Calibrated AMS dates from House 1.
Figure 7.30: Bayesian sequence from House 1 AMS dates.

Figure 7.31: House Block 2 excavation map.
Figure 7.32: House 2 basin at 70cmbs.
Figure 7.33: Wall trenches on north side of House 2; Features 119, 121, 122 (unexcavated)

Figure 7.34: Wall trenches on north side of House 2; Features 119, 121, 122 (excavated)
Figure 7.35: Feature 161, south of House 2 (NE 1/4 excavated; 120cmts)

Figure 7.36: Base of Feature 100, north of House 2 (120cmts).
Figure 7.37: Density of material remains from units in House Block 2
Figure 7.38: Ceramic body sherd temper from contexts in House Block 2.

Figure 7.39: Surface treatment of shell tempered body sherds from contexts in House Block 2.

Figure 7.40: Ceramic body sherds number and weight by context in House Block 2.
Figure 7.41: Average body sherd size (g) by context in House Block 2.
Figure 7.42: Selected ceramic sherds from House Block 2.
Figure 7.43 - House Block 2 Jar Rim Diameter by Context (≥3 percent complete)
Figure 7.44: House Block 2 projectile points and projectile point fragments

Unit, level, and context for each specimen: 1: Unit 8, 40-50 (House 2); 2: Unit 7, 30-40 (House 2); 3: Unit 10, 50-60 (midden); 4: Unit 5, Feature 122 (House 2); 5: Unit 3, 50-60 (F.100); 6: Unit 2, 60-70 (F.100); 7: Unit 7, 50-60 (F.100); 8: Unit 6, 50-60 (House 2); 9: Feature 100, 70-sub; 10: Unit 7, 50-60 (House 2); 11: Unit 10, 40-50 (midden); 12: Unit 1, 30-40 (F.100); 13: Feature 100, 60-70; 14: Unit 2, 30-40 (F.100); 15: Unit 5, 30-40 (House 2); 16: Unit 7, 60-70 (House 2); 17: Unit 7, 50-60 (House 2); 18: Unit 7, 30-40 (House 2); 19: Unit 3, 40-50 (F.100); 20: Unit 1, 50-60 (F.100); 21: Unit 2, 60-70 (F.100); 22: Unit 8, 30-40 (House 2); 23: Unit 2, 40-50 (F.100); 24: Unit 2, 60-70 (F.100); 25: Unit 8, 30-40 (House 2); 26: Unit 3, 50-60 (F.100); 27: Unit 1, 40-50 (F.100); 28: Unit 5, 30-40 (House 2); 29: Unit 4, 40-50 (House 2); 30: Unit 3, 60-70 (F.100); 31: Unit 1, 40-50 (F.100); 32: Unit 5, 30-40 (House 2); 33: Unit 1, 60-70 (F.100); 34: Unit 4, 40-50 (House 2); 35: Unit 7, 40-50 (House 2); 36: Unit 8, 40-50 (House 2); 37: Unit 8, 30-40 (House 2); 38: Unit 3, 30-40 (F.100); 39: Unit 7, 50-60 (House 2); 40: Unit 2, 30-40 (F.100); 41: Unit 5, Feature 122.
Figure 7.45: House Block 2 bifaces and biface fragments

Unit, level, and context for each specimen: 1: Unit 1, 40-50 (F.100); 2: Unit 1, 50-60 (F.100); 3: Unit 3, 60-70 (F.100); 4: Unit 2, 60-70 (F.100); 5: Unit 10, 50-60 (midden); 6: Unit 2, 60-70 (F.100); 7: Unit 2, 30-40 (F.100); 8: Unit 3, 60-70 (F.100); 9: Unit 3, 40-50 (F.100); 10: Unit 9, 50-60 (midden); 11: Unit 8, 30-40 (House 2); 12: Unit 1, 60-70 (F.100); 13: Unit 2, 30-40 (F.100); 14: Unit 3, 30-40 (F.100); 15: Unit 2, 30-40 (F.100); 16: Unit 8, 30-40 (House 2); 17: Unit 8, 60-70 (House 2).
Figure 7.46: House Block 2 other chipped stone tools.

**Unit, level, and context for each specimen:**

1: Unit 4, 60-70 (House 2); 2: Unit 1, 60-70 (F.100); 3: Unit 3, 60-70 (F.100); 4: Unit 6, 40-50 (House 2); 5: Unit 6, 60-70 (House 2); 6: Unit 7, 30-40 (House 2); 7: Unit 5, F.122; 8: Unit 1, 50-60 (F.100); 9: Unit 1, 60-70 (F.100); 10: Unit 4, 60-70 (House 2); 11: Unit 1, 40-50 (F.100); 12: Unit 1, 50-60 (F.100).
Figure 7.47: House Block 2 non-chipped stone artifacts.

**Unit, level, and context for each specimen:** 1: Unit 10, 40-50 (middlen); 2: Unit 1 (F.126); 3: 70+, F.119, 121, 122; 4: 70+, F.119, 121, 122; 5: F.100; 6: Unit 1, 60-70 (F.100); 7: Unit 6 (F.115); 8: F.100; 9: Unit 1, 60-70 (F.100).
Figure 7.48: Faunal Remains in units from House Block 2.

Figure 7.49: Botanical Remains from sampled contexts in House Block 2.
Figure 7.50: Bone tools and implements recovered from House Block 2

**Unit, level, and context for each specimen:** 1: Unit 2, 60-70 (F.100); 2: 70-78 (F.118,121); 3: Unit 2, 30-40 (F.100); 4: Unit 2, 30-40 (F.100); 5: 70-subsoil (F.100); 6: Unit 4, 30-40 (House 2); 7: Unit 4, 50-60 (House 2); 8: 70-subsoil (F.100); 9: 70-subsoil (F.100); 10: 70-subsoil (F.100); 11: Unit 1, 50-60 (F.100); 12: Unit 5, 30-40 (House 2); 13: Unit 2, 60-70 (F.100); 14: Unit 4, 40-50 (House 2); 15: Unit 2, 40-50 (F.100); 16: Unit 8 (F.117); 17: Unit 5; F.122); 18: Unit 3, 50-60 (F.100); 19: 70-subsoil (F.100); 20: Unit 1, 40-50 (F.100); 21: Unit 3, 60-70 (F.100); 22: Unit 1, 50-60 (F.100).
Figure 7.51: Shell hoes recovered from House Block 2. All recovered from F.100.
Figure 7.52: Other artifacts recovered from House Block 2.

Unit, level, and context for each specimen: 1: Unit 9, 30-40 (middlen); 2: Unit 2, 50-60 (F.100); 3: Unit 5 (F.122).

Figure 7.53: Notable artifacts recovered from Feature 100.
Figure 7.54: House Block 2 date contexts.

Figure 7.55: Calibrated AMS dates from House Block 2.
Figure 7.56: Bayesian sequence for House Block 2.

Figure 7.57: Body sherd count and weight (g) per unit in House Blocks 1 and 2.
Figure 7.58: Average body sherd size (g) for all contexts.


### Chapter 7 Tables

<table>
<thead>
<tr>
<th>Vessel Type</th>
<th>House Block 1 All</th>
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<td>Count</td>
<td>Percent</td>
<td>Count</td>
</tr>
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<td>Bowl</td>
<td>47</td>
<td>12.05</td>
<td>44</td>
</tr>
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<td>Plate</td>
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<td>0.26</td>
<td>1</td>
</tr>
<tr>
<td>Jar</td>
<td>336</td>
<td>86.15</td>
<td>318</td>
</tr>
<tr>
<td>Short-necked Jar</td>
<td>6</td>
<td>1.54</td>
<td>6</td>
</tr>
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<td>Total</td>
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<td>100</td>
<td>369</td>
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Table 7.1: Identifiable vessel types by context in House Block 1.

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<th></th>
<th>Rims</th>
<th></th>
<th>Total</th>
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<tr>
<td></td>
<td>Rock</td>
<td>Shell</td>
<td>Total</td>
<td>Rock</td>
<td>Shell</td>
<td>Total</td>
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<td>Cordmarked</td>
<td>2</td>
<td>13</td>
<td>15</td>
<td>8</td>
<td>51</td>
<td>59</td>
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<tr>
<td>Plain</td>
<td>2</td>
<td>130</td>
<td>132</td>
<td>3</td>
<td>290</td>
<td>293</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
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<td>144</td>
<td>148</td>
<td>11</td>
<td>345</td>
<td>356</td>
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Table 7.2: Rim and Neck surface treatment and temper in House Block 1.

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<th>Necks</th>
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<th>Rims</th>
<th></th>
<th>Total</th>
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<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Indeterminate Incised</td>
<td>40</td>
<td>27.03</td>
<td>11</td>
<td>42.31</td>
<td>51</td>
<td>29.31</td>
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<tr>
<td>Curvilinear Guilloche</td>
<td>52</td>
<td>35.14</td>
<td>6</td>
<td>23.08</td>
<td>58</td>
<td>33.33</td>
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<td>Curvi-Rectilinear Guilloche</td>
<td>1</td>
<td>0.68</td>
<td>1</td>
<td>3.85</td>
<td>2</td>
<td>1.15</td>
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<td>Line-filled Triangle</td>
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<td>0.00</td>
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<td>0.57</td>
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<td>Ramey-like</td>
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<td>2</td>
<td>7.69</td>
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<td>2.30</td>
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<td>1.72</td>
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<td>Positive Paint</td>
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<td>29.73</td>
<td>0</td>
<td>0.00</td>
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<td>25.29</td>
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<tr>
<td>Negative Paint</td>
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<td>1.35</td>
<td>1</td>
<td>3.85</td>
<td>3</td>
<td>1.72</td>
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<tr>
<td>Red Slip</td>
<td>1</td>
<td>0.68</td>
<td>2</td>
<td>7.69</td>
<td>3</td>
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<td>1</td>
<td>3.85</td>
<td>1</td>
<td>0.57</td>
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<tr>
<td>Other</td>
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<td>1</td>
<td>3.85</td>
<td>2</td>
<td>1.15</td>
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<tr>
<td>Total</td>
<td>148</td>
<td>100.0</td>
<td>26</td>
<td>100.00</td>
<td>174</td>
<td>100.00</td>
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Table 7.3: Decoration evident on rims and necks in House Block 1.
<table>
<thead>
<tr>
<th>Sample</th>
<th>Context</th>
<th>Age</th>
<th>Error</th>
<th>Cal. AD Range (2-sigma)</th>
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<tbody>
<tr>
<td>AA107647</td>
<td>HB1; Unit 9; F.12 - Post in outer wall trench, east side</td>
<td>815</td>
<td>23</td>
<td>1181-1265</td>
</tr>
<tr>
<td>AA107648</td>
<td>HB1; Unit 9; F.56 - post in inner wall trench, east side</td>
<td>905</td>
<td>19</td>
<td>1040-1188</td>
</tr>
<tr>
<td>AA107649</td>
<td>HB1; Unit 6; F.7 - puddled clay hearth</td>
<td>859</td>
<td>24</td>
<td>1054-1078 (4.6%); 1152-1250 (90.8%)</td>
</tr>
<tr>
<td>AA107650</td>
<td>HB1; Unit 15; F.14 - Post in wall trench of N. side</td>
<td>881</td>
<td>19</td>
<td>1049-1084 (19%); 1125-1217 (74.5%)</td>
</tr>
<tr>
<td>AA107651</td>
<td>HB1; Unit 5 - 50-60cmbs; midden fill from House 1</td>
<td>851</td>
<td>44</td>
<td>1045-1095(14.1%); 1120-1265 (81.1%)</td>
</tr>
<tr>
<td>AA107657</td>
<td>HB1; Unit 11; 40-50cmbs - Midden Outside House 1</td>
<td>938</td>
<td>20</td>
<td>1031-1155</td>
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Table 7.4: AMS dates from House Block 1.

<table>
<thead>
<tr>
<th>Date 1</th>
<th>Date 2</th>
<th>Significant Difference?</th>
<th>Statistics</th>
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<tr>
<td>815 ± 23 (outer post)</td>
<td>905 ± 19 (inner post)</td>
<td>Yes</td>
<td>T = 9.10; X2 = 3.84; df = 1</td>
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<td>815 ± 23 (outer post)</td>
<td>859 ± 24 (hearth)</td>
<td>No</td>
<td>T = 1.75; X2 = 3.84; df = 1</td>
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<td>815 ± 23 (outer post)</td>
<td>881 ± 19 (N post)</td>
<td>Yes</td>
<td>T = 4.89; X2 = 3.84; df = 1</td>
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<td>815 ± 23 (outer post)</td>
<td>851 ± 44 (fill)</td>
<td>No</td>
<td>T = 0.52; X2 = 3.84; df = 1</td>
</tr>
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<td>815 ± 23 (outer post)</td>
<td>938 ± 20 (ext. midden)</td>
<td>Yes</td>
<td>T = 16.28; X2 = 3.84; df = 1</td>
</tr>
<tr>
<td>905 ± 19 (inner post)</td>
<td>859 ± 24 (hearth)</td>
<td>No</td>
<td>T = 2.26; X2 = 3.84; df = 1</td>
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<tr>
<td>905 ± 19 (inner post)</td>
<td>881 ± 19 (N post)</td>
<td>No</td>
<td>T = 0.79; X2 = 3.84; df = 1</td>
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<tr>
<td>905 ± 19 (inner post)</td>
<td>851 ± 44 (fill)</td>
<td>No</td>
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<tr>
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<td>851 ± 44 (fill)</td>
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</tr>
<tr>
<td>851 ± 44 (fill)</td>
<td>938 ± 20 (ext. midden)</td>
<td>No</td>
<td>T = 3.24; X2 = 3.84; df = 1</td>
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Table 7.5: Pair-wise tests of AMS dates from House Block 1.
### Table 7.6: Bayesian sequence from House Block 1.

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<tr>
<th>House Block 1 Sequence</th>
<th>Cal. Range (2-sigma)</th>
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<td>Start 1st Phase</td>
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<td>Exterior Midden</td>
<td>AD 1038-1159</td>
<td>98.3</td>
</tr>
<tr>
<td>1st Building Episode</td>
<td>AD 1048-1169</td>
<td>96.7</td>
</tr>
<tr>
<td>End 1st Phase</td>
<td>AD 1060-1195</td>
<td></td>
</tr>
<tr>
<td>Start 2nd Phase</td>
<td>AD 1141-1237</td>
<td></td>
</tr>
<tr>
<td>2nd Building Episode</td>
<td>AD 1162-1233</td>
<td>44.6</td>
</tr>
<tr>
<td>Hearth</td>
<td>AD 1166-1243</td>
<td>104.3</td>
</tr>
<tr>
<td>Fill</td>
<td>AD 1170-1250</td>
<td>127</td>
</tr>
<tr>
<td>End 2nd Phase</td>
<td>AD 1167-1278</td>
<td></td>
</tr>
</tbody>
</table>

### Table 7.7: Identifiable vessel types by context in House Block 2.

<table>
<thead>
<tr>
<th>Vessel Type</th>
<th>House 2</th>
<th>Feature 100</th>
<th>Exterior Midden</th>
<th>House Block 2 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percent</td>
<td>Count</td>
<td>Percent</td>
</tr>
<tr>
<td>Bowl</td>
<td>12</td>
<td>11.65</td>
<td>27</td>
<td>12.50</td>
</tr>
<tr>
<td>Plate</td>
<td>1</td>
<td>0.97</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Jar</td>
<td>87</td>
<td>84.47</td>
<td>187</td>
<td>86.57</td>
</tr>
<tr>
<td>Short-necked Jar</td>
<td>3</td>
<td>2.91</td>
<td>2</td>
<td>0.93</td>
</tr>
<tr>
<td>Totals</td>
<td>103</td>
<td>100.00</td>
<td>216</td>
<td>100.00</td>
</tr>
</tbody>
</table>

### Table 7.8: Rim and Neck surface treatment and temper in House Block 1.

<table>
<thead>
<tr>
<th></th>
<th>Rims</th>
<th>Necks</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rock</td>
<td>Shell</td>
<td>Sand</td>
</tr>
<tr>
<td>Cordmarked</td>
<td>33</td>
<td>44</td>
<td>1</td>
</tr>
<tr>
<td>Plain</td>
<td>11</td>
<td>270</td>
<td>3</td>
</tr>
<tr>
<td>Fabric Impressed</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>315</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 7.8: Rim and Neck surface treatment and temper in House Block 1.
<table>
<thead>
<tr>
<th></th>
<th>Necks</th>
<th>Rims</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>154</td>
<td>30.31</td>
<td>20</td>
</tr>
<tr>
<td>Incised</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curvilinear</td>
<td>247</td>
<td>48.62</td>
<td>30</td>
</tr>
<tr>
<td>Guilloche</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rectilinear</td>
<td>5</td>
<td>0.98</td>
<td>1</td>
</tr>
<tr>
<td>Guilloche</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curvilinear</td>
<td>7</td>
<td>1.38</td>
<td>0</td>
</tr>
<tr>
<td>Rectilinear</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guilloche</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line-filled</td>
<td>17</td>
<td>3.35</td>
<td>5</td>
</tr>
<tr>
<td>Triangle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ramey-like</td>
<td>4</td>
<td>0.79</td>
<td>0</td>
</tr>
<tr>
<td>Incised Angular</td>
<td>12</td>
<td>2.36</td>
<td>6</td>
</tr>
<tr>
<td>Punctate</td>
<td>1</td>
<td>0.20</td>
<td>3</td>
</tr>
<tr>
<td>Positive Paint</td>
<td>34</td>
<td>6.69</td>
<td>1</td>
</tr>
<tr>
<td>Negative Paint</td>
<td>1</td>
<td>0.20</td>
<td>1</td>
</tr>
<tr>
<td>Slip - red</td>
<td>1</td>
<td>0.20</td>
<td>2</td>
</tr>
<tr>
<td>Slip - black</td>
<td>0</td>
<td>0.00</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>0.39</td>
<td>0</td>
</tr>
<tr>
<td>Burnished</td>
<td>10</td>
<td>1.97</td>
<td>4</td>
</tr>
<tr>
<td>Incised/punctate</td>
<td>13</td>
<td>2.56</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>508</td>
<td>100.0</td>
<td>77</td>
</tr>
</tbody>
</table>

Table 7.9: Ceramic decoration evident on rims and necks from House Block 2.

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Context</th>
<th>Age</th>
<th>Error</th>
<th>Cal. AD Range (2-sigma)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA107652</td>
<td>HB2; Unit 7; F. 154 - Post in outer wall trench, north</td>
<td>788</td>
<td>19</td>
<td>1219 - 1270</td>
</tr>
<tr>
<td>AA107653**</td>
<td>HB2; Unit 8; F. 166 - Post in wall trench south end of House 2</td>
<td>855</td>
<td>63</td>
<td>1039-1267</td>
</tr>
<tr>
<td>AA107654</td>
<td>HB2; Unit 7; F.158 - Post in inner wall trench - North</td>
<td>805</td>
<td>20</td>
<td>1206-1270</td>
</tr>
<tr>
<td>AA107655</td>
<td>HB2; Unit 2; 60-70cmbs; F. 100 - Party Pit</td>
<td>772</td>
<td>19</td>
<td>1223-1276</td>
</tr>
<tr>
<td>AA107656**</td>
<td>HB2; Unit 6; 60-70cmbs; Midden Fill from House 2</td>
<td>692</td>
<td>46</td>
<td>1246-1329 (62.2%); 1341-1396 (33.2%)</td>
</tr>
</tbody>
</table>

Table 7.10: AMS dates from House Block 2. ** Potential for lab error
<table>
<thead>
<tr>
<th>Date 1</th>
<th>Date 2</th>
<th>Significant Difference?</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>788 ± 19 (outer trench)</td>
<td>855 ± 63 (S wall)</td>
<td>No</td>
<td>T = 1.04; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>788 ± 19 (outer trench)</td>
<td>805 ± 20 (inner trench)</td>
<td>No</td>
<td>T = 0.38; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>788 ± 19 (outer trench)</td>
<td>772 ± 19 (party pit)</td>
<td>No</td>
<td>T = 0.35; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>788 ± 19 (outer trench)</td>
<td>692 ± 46 (H2 fill)</td>
<td>No (approaching)</td>
<td>T = 3.72; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>855 ± 63 (S wall)</td>
<td>805 ± 20 (inner trench)</td>
<td>No</td>
<td>T = 1.47; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>855 ± 63 (S wall)</td>
<td>772 ± 19 (party pit)</td>
<td>No</td>
<td>T = 2.95; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>855 ± 63 (S wall)</td>
<td>692 ± 46 (H2 fill)</td>
<td>Yes</td>
<td>T = 6.12; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>805 ± 20 (inner trench)</td>
<td>772 ± 19 (party pit)</td>
<td>No</td>
<td>T = 1.43; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>805 ± 20 (inner trench)</td>
<td>692 ± 46 (H2 fill)</td>
<td>Yes</td>
<td>T = 5.07; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>772 ± 19 (party pit)</td>
<td>692 ± 46 (H2 fill)</td>
<td>No</td>
<td>T = 2.58; X(^2) = 3.84; df = 1</td>
</tr>
</tbody>
</table>

Table 7.11: Pair-wise tests of AMS dates from House Block 2.

<table>
<thead>
<tr>
<th>House Block 2 Sequence</th>
<th>Cal. Range (2-sigma)</th>
<th>Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start</td>
<td>AD 1128-1267</td>
<td></td>
</tr>
<tr>
<td>Inner Wall</td>
<td>AD 1214-1264</td>
<td>106</td>
</tr>
<tr>
<td>Outer Wall</td>
<td>AD 1226-1269</td>
<td>109</td>
</tr>
<tr>
<td>Party Pit</td>
<td>AD 1241-1279</td>
<td>120</td>
</tr>
<tr>
<td>Fill</td>
<td>AD 1242-1320 (94.4%); 1366-1376 (1.0%)</td>
<td>108</td>
</tr>
<tr>
<td>End</td>
<td>AD 1233-1451</td>
<td></td>
</tr>
</tbody>
</table>

Table 7.12: Bayesian sequence from House Block 2.

<table>
<thead>
<tr>
<th>House Block 1 Date</th>
<th>House Block 2 Date</th>
<th>Significant Difference?</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>815 ± 23 (H1 outer trench)</td>
<td>788 ± 19 (HB2 outer trench)</td>
<td>No</td>
<td>T = 0.82; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>815 ± 23 (H1 outer trench)</td>
<td>805 ± 20 (HB2 inner trench)</td>
<td>No</td>
<td>T = 0.11; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>905 ± 19 (H1 inner trench)</td>
<td>788 ± 19 (HB2 outer trench)</td>
<td>Yes</td>
<td>T = 18.96; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>905 ± 19 (H1 inner trench)</td>
<td>805 ± 20 (HB2 inner trench)</td>
<td>Yes</td>
<td>T = 13.14; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>881 ± 19 (HB1 N trench)</td>
<td>788 ± 19 (HB2 outer trench)</td>
<td>Yes</td>
<td>T = 11.98; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>881 ± 19 (HB1 N trench)</td>
<td>805 ± 20 (HB2 inner trench)</td>
<td>Yes</td>
<td>T = 7.59; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>815 ± 23 (H1 outer trench)</td>
<td>855 ± 63 (HB2 south wall trench)</td>
<td>No</td>
<td>T = 0.36; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>905 ± 19 (H1 inner trench)</td>
<td>855 ± 63 (HB2 south wall trench)</td>
<td>No</td>
<td>T = 0.58; X(^2) = 3.84; df = 1</td>
</tr>
<tr>
<td>881 ± 19 (HB1 N trench)</td>
<td>855 ± 63 (HB2 south wall trench)</td>
<td>No</td>
<td>T = 0.16; X(^2) = 3.84; df = 1</td>
</tr>
</tbody>
</table>

Table 7.13: Pair-wise tests of AMS dates from House Block 1 and House Block 2.
<table>
<thead>
<tr>
<th>Architecture Date</th>
<th>Burial Date</th>
<th>Sig Diff?</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>905 ± 19 (H1 inner trench)</td>
<td>923 ± 45 (mound burial) (Sr = 0.70953) (Cahokia?)</td>
<td>No</td>
<td>T=0.13; X²=3.84; df=1</td>
</tr>
<tr>
<td>905 ± 19 (H1 inner trench)</td>
<td>983 ± 46 (mound pattern) (Sr = 0.71119) (Middle Cumb.)</td>
<td>No</td>
<td>T=2.45; X²=3.84; df=1</td>
</tr>
<tr>
<td>905 ± 19 (H1 inner trench)</td>
<td>763 ± 46 (mound pattern) (Sr. = 0.71085) (Local)</td>
<td>Yes</td>
<td>T=8.14; X²=3.84; df=1</td>
</tr>
<tr>
<td>815 ± 23 (H1 outer trench)</td>
<td>923 ± 45 (mound burial) (Sr = 0.70953) (Cahokia?)</td>
<td>Yes</td>
<td>T=5.74; X²=3.84; df=1</td>
</tr>
<tr>
<td>815 ± 23 (H1 outer trench)</td>
<td>983 ± 46 (mound pattern) (Sr = 0.71119) (Middle Cumb.)</td>
<td>Yes</td>
<td>T=12.59; X²=3.84; df=1</td>
</tr>
<tr>
<td>815 ± 23 (H1 outer trench)</td>
<td>763 ± 46 (mound pattern) (Sr. = 0.71085) (Local)</td>
<td>No</td>
<td>T=0.70; X²=3.84; df=1</td>
</tr>
<tr>
<td>805 ± 20 (HB2 inner trench)</td>
<td>923 ± 45 (mound burial) (Sr = 0.70953) (Cahokia?)</td>
<td>Yes</td>
<td>T=7.63; X²=3.84; df=1</td>
</tr>
<tr>
<td>805 ± 20 (HB2 inner trench)</td>
<td>983 ± 46 (mound pattern) (Sr = 0.71119) (Middle Cumb.)</td>
<td>Yes</td>
<td>T=15.35; X²=3.84; df=1</td>
</tr>
<tr>
<td>788 ± 19 (HB2 outer trench)</td>
<td>923 ± 45 (mound burial) (Sr = 0.70953) (Cahokia?)</td>
<td>Yes</td>
<td>T=7.46; X²=3.84; df=1</td>
</tr>
<tr>
<td>788 ± 19 (HB2 outer trench)</td>
<td>983 ± 46 (mound pattern) (Sr = 0.71119) (Middle Cumb.)</td>
<td>Yes</td>
<td>T=13.55; X²=3.84; df=1</td>
</tr>
<tr>
<td>788 ± 19 (HB2 outer trench)</td>
<td>763 ± 46 (mound pattern) (Sr. = 0.71085) (Local)</td>
<td>No</td>
<td>T=0.25; X²=3.84; df=1</td>
</tr>
</tbody>
</table>

Table 7.14: Pair-wise tests of AMS dates from House Block 1, House Block 2, and strontium outlier burials.

<table>
<thead>
<tr>
<th>Rim Diameter</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>House 2</td>
<td>38</td>
<td>21.11</td>
<td>8.723</td>
<td>1.415</td>
<td>7</td>
<td>40</td>
</tr>
<tr>
<td>House 1</td>
<td>185</td>
<td>27.35</td>
<td>9.248</td>
<td>.680</td>
<td>8</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>223</td>
<td>26.29</td>
<td>9.440</td>
<td>.632</td>
<td>7</td>
<td>54</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum Rim Thickness</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>House 2</td>
<td>37</td>
<td>8.9838</td>
<td>2.25296</td>
<td>.37038</td>
<td>5.00</td>
<td>15.50</td>
</tr>
<tr>
<td>House 1</td>
<td>182</td>
<td>9.6533</td>
<td>1.83184</td>
<td>.13579</td>
<td>5.70</td>
<td>16.40</td>
</tr>
<tr>
<td>Total</td>
<td>219</td>
<td>9.5402</td>
<td>1.92030</td>
<td>.12976</td>
<td>5.00</td>
<td>16.40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thickness Below Rim</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>House 2</td>
<td>36</td>
<td>6.9111</td>
<td>1.69954</td>
<td>.28326</td>
<td>4.50</td>
<td>11.50</td>
</tr>
<tr>
<td>House 1</td>
<td>178</td>
<td>7.5455</td>
<td>1.64846</td>
<td>.12356</td>
<td>4.10</td>
<td>12.60</td>
</tr>
<tr>
<td>Total</td>
<td>214</td>
<td>7.4388</td>
<td>1.67013</td>
<td>.11417</td>
<td>4.10</td>
<td>12.60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rim Fold Height</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>House 2</td>
<td>13</td>
<td>17.1769</td>
<td>3.79784</td>
<td>1.05333</td>
<td>12.50</td>
<td>23.10</td>
</tr>
<tr>
<td>House 1</td>
<td>62</td>
<td>17.5645</td>
<td>4.97364</td>
<td>.63165</td>
<td>9.70</td>
<td>29.90</td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>17.4973</td>
<td>4.76992</td>
<td>.55078</td>
<td>9.70</td>
<td>29.90</td>
</tr>
</tbody>
</table>

Table 7.15: Rim metrics for House 1 and House 2.
<table>
<thead>
<tr>
<th>Context</th>
<th>House 1</th>
<th>House 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rim Flare</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flared</td>
<td>Count</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>10.1</td>
</tr>
<tr>
<td>Incurvate</td>
<td>Count</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>1.1</td>
</tr>
<tr>
<td>Slightly Flared</td>
<td>Count</td>
<td>237</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>66.4</td>
</tr>
<tr>
<td>Slightly Incurvate</td>
<td>Count</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>9.0</td>
</tr>
<tr>
<td>Straight</td>
<td>Count</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>13.4</td>
</tr>
<tr>
<td><strong>Rim Fold</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Count</td>
<td>302</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>74.8</td>
</tr>
<tr>
<td>Yes</td>
<td>Count</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td>Percent</td>
<td>25.2</td>
</tr>
<tr>
<td><strong>Lip Description</strong></td>
<td></td>
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Table 7.16: Non-metric rim attributes for House 1 and House 2.
### Table 7.17: Decoration types for House 1, House 2, and Feature 100.

<table>
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<th>Design Type</th>
<th>House 1</th>
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<td>Indet. Incised</td>
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<td>42.44</td>
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<td>Curvilinear Guilloche</td>
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### Table 7.18: Surface treatment by temper type for all ceramics.

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### Table 7.19: Non-metric attributes for by temper; all contexts.

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Chapter 8: Placing Turpin within Fort Ancient and Mississippian Contexts

This chapter moves up in scale and nests findings from the Turpin site in two levels of analysis. First, I characterize the early Fort Ancient (c. AD 1000-1250) system in the lower Miami Valleys and the Middle Ohio Valley. Second, I expand the scope of analysis to consider how patterning in early Fort Ancient period sites compares to contemporary Mississippian settlements. Examinations first incorporate univariate elements of site characteristics and material culture. Following this, correspondence analysis is used at each level to characterize ceramic assemblages from sites throughout the region. It is assumed that similarity in ceramics assemblages serves as a general proxy for connectedness of populations, particularly considering the spread of shell tempering. Considered another way, populations of migrants stemming from a similar home region should have similar methods and standards for the production of ceramics. Using these data in association with cultural and biological evidence cited in this study, this exploration will help examine the relatedness of early period sites and evidence of the movement of people into the Middle Ohio Valley.

Early Fort Ancient Period

Findings from this study at Turpin, along with recent work at Guard (Cook et al. 2015; Cook et al. n.d.) and chronological work at State Line (Cook 2014) have called into question traditional conceptualizations of the early Fort Ancient period. In order to generate a more comprehensive understanding of this period, Turpin, Guard, and State Line will be compared based on site structure, household architecture, and the composition of ceramics assemblages. These sites are the only known dated sites in this region and constitute the primary sample for understanding the early Fort Ancient period in the Miami Valleys. To examine this period at a broader geographic scale, three sites
from Kentucky, Muir, Thompson, and Dry Run, will be included (Figure 8.1). These sites are considered representative of the early Fort Ancient period in Kentucky (Henderson 1992, 2008) and should result in an informative comparison that highlights similarities and differences between these regions.

The variables used in this analysis are broken down into categories of chronology, site structure, houses, and ceramic characteristics. Because this comparison seeks to examine only sites within the early Fort Ancient period, available chronological evidence will be analyzed. In terms of site structure, community shape (circular, linear, unknown) and the presence/absence of a plaza will be considered. In terms of house, the number of wall trench structures will be used when available. In regard to community structure and household characteristics, the disparity in excavation intensity limits some comparisons. In these cases, available evidence will be presented, and gaps will be highlighted as suggested areas of future research.

The primary element of this study is the composition of ceramic assemblages. Although there are discrepancies in the amounts of ceramics recovered from each site, proportions of the variables in question help to understand relative amounts at each site. First, the number of shell vs. rock tempered sherds is tabulated. Increased prevalence of shell is thought to be related to the spread of Mississippian people and/or ideas (e.g., Cook and Fargher 2008), so its frequency at early sites should prove informative. Second, the frequency of plain vs. cordmarked sherds is examined. In a very general sense, cordmarking is seen to be a more local or Woodland trait (e.g., Seeman and Dancey 2000). In order to examine the prevalence of Mississippi Plain ceramics at sites from this time period, these data are combined to determine the proportion of shell/plain, shell/cordmarked, rock/plain, and rock/cordmarked vessels at these sites. Third, the frequency of decoration on ceramics is assessed. Typically, Mississippian sites exhibit less decoration on ceramics than Fort Ancient sites like SunWatch (e.g., Cook 2008; Hilgeman 2000). Fourth, the types of decoration at each site (e.g., guilloche, line-filled triangles, chevrons) are tabulated. Finally, the proportion of bowls in each assemblage is used as an indicator of overall assemblage diversity.

In order to compare these sites, two steps will be used. First, univariate tabulations of raw counts and proportions of these variables will be examined. Visual
examination of inter-site patterning can identify useful trends on an initial level. Second, correspondence analysis, typically used in archaeology since we often deal with frequency data (e.g., Cook 2008), will be used to examine how these variables interact in multivariate space (see Hair et al. 2009). Groupings of sites and styles at each level will be interpreted.

Guard

The Guard site (12D29) is one of the best understood early Fort Ancient villages in the lower Miami Valleys. Survey and targeted excavations by Ohio State University in 2012, 2014, and 2016 (Cook et al. 2015; Cook et al. n.d.) have produced considerable data regarding chronology, community structure, and material culture. The 2012 field season focused on three possible structures (Houses 1-3), testing magnetic anomalies with 1-meter wide trenches (Cook et al. 2015). The 2014 field season examined one house (House 4) in greater detail (Cook et al. n.d.). The 2016 field season attempted to determine if the multitude of magnetic anomalies in the center of the village were trash pits of Fort Ancient affiliation. A brief summary of these elements follows in order to characterize the site for subsequent analyses.

A magnetic survey by Burks and Cook revealed that the Guard site was a large, circular village with numerous potential structures evident. This survey identified between 20 and 27 structures, 4 of which have been excavated and shown to be early Fort Ancient in origin. Only about half of the village was able to be surveyed; the other half lies under a large transmission tower and a modern road and railroad track. From what is available, it is apparent that this village was arranged in a circle around a central plaza area. While this plaza may not have been vacant, it was certainly an area of communal activity. In this sense, the site incorporates aspects of a Mississippian design or site grammar (Cook et al. 2015).

At this point, portions of four structures have been excavated. House 1, which dates between AD 1035-1222 (post mold), was a large (approximately seven meters wide) house located in the western edge of the village. This structure had numerous internal features, and an external hearth/cooking area just outside the house on the plaza side. It also had what was interpreted as a large commemorative post that cut through the
house basin fill and dated to AD 1278-1294, which is statistically later than the house itself. House 2, located in the northern edge of the village, dates to AD 1023-1189 and reflects the remains of structure with at least one wall trench. The floor of the house had concentrations of carbonized wood and burned soil, which were interpreted as burned wall segments. House 3, located in the southern portion of the village, dates to AD 1042-1251. This large (6m) structure has two wall trenches and numerous internal features. Much like Houses 1 and 2, House 3 appears to have been burned. House 4 was excavated in 2014 by placing 3x3m blocks on the northeast and southwest corners of the structure. Much like House 3, this structure was constructed using wall trenches. This house dates between AD 994 and AD 1148.

The ceramic assemblage from the 2012 excavations at Guard incorporates 967 rim and neck sherds. The majority of identifiable vessels in this sample are jars (97.5%) with a smaller number of bowls (2.3%) and indeterminate vessel types (0.9%). Most of these vessels were tempered with shell (95.2%), with a smaller number (4.8%) of rock tempered vessels. Where it could be determined, there was a relatively even split between vessels with plain/smooth bodies (46.4%) and those with cordmarked bodies (53.6%). Taking temper and surface treatment together, most vessels in this sample from Guard were either shell/cordmarked (55%) or shell/plain (39%), with smaller proportions of rock/plain (4%) and rock/cordmarked (2%) vessels. It should be noted that recent excavations in the center of the village produced a high proportion of shell/plain vessels (Cook et al. n.d.), although this information has yet to be tabulated.

A majority of vessels in this sample were decorated (71.2%), which is one of the highest proportions for sites in this study. Decorative motifs were primarily curvilinear guilloche (61.9%), with smaller numbers of rectilinear guilloche (16.4%), curvirectilinear guilloche (9%), line-filled triangles (9%), and punctates (3.7%). Recovered appendages were predominately strap handles (80.7%), with smaller numbers of loop/strap handles (9.7%), loop handles (6.5%), and lug handles (3.2%).

In summary, the Guard site is a large early Fort Ancient village with at least three wall trench structures that date between AD 1000 and AD 1300. The ceramic assemblage from 2012 excavations is slightly anomalous in the context of the present study, although 2016 excavations may clarify this issue (Cook et al. n.d.). The assemblage is dominated
by jars, most of which are shell tempered and either plain or cordmarked. Notably, a large proportion of vessels are decorated, primarily with curvilinear guilloche designs. This is well in line with Cowan's (1987) suggestion that Fort Ancient in this region tended to be 'baroque.' In many ways, Guard appears to be a hybrid between what we typically consider Mississippian and Fort Ancient villages.

**State Line**

The State Line site (33HA58) is one of the largest and unfortunately most thoroughly disturbed (via construction and looting) sites in the Miami Valleys. Some systematic excavations were conducted at the site in the 1970's, although much of this was salvage work. Vickery et al. (2000) provide a synthesis of the major findings. Because much of this work is hard to contextualize within the broader State Line site, the findings from these projects, much of which are outlined in great detail, will be used to characterize the site assemblage.

Vickery et al. suggest that State Line was a middle Fort Ancient period settlement. Similarly, Pollack et al. (2002) suggested this site must have been occupied after AD 1400 because of the numerous Mississippian artifacts recovered. A recent report by Cook (2014), which involved a large-scale AMS dating scheme of Fort Ancient sites, suggests otherwise. Cook and Comstock (2014), using these new dates, along with a refined projectile point typology, classified State Line as early Fort Ancient, occupied primarily between AD 1020 and AD 1280. State Line then, should be considered with this group of sites in order to contextualize early Fort Ancient sites.

Excavations at the site revealed segments (n=23) of numerous wall trench structures in addition to a smaller number of potential set-post structures. Vickery et al. (2000) suggest that a plaza was encountered, but the dynamic of the site resulted in shifting plazas, only the latest of which was evident. Historical photographs of the landform support this hypothesis (Cook 2017). Additionally, segments of 6 puddled clay hearths were encountered. Burials from the site were primarily extended, but a number of stone-box graves, similar to those in Tennessee (e.g., Lewis and Kneberg 1946:144), were recovered as well. Maize dominates the identifiable botanical assemblage.
Salvage excavations produced a ceramic assemblage of over 200,000 specimens. Analysis of 1,961 rim/neck sherds provides an avenue for comparison. Of the site examined for this comparison, State Line had the most variability in vessel forms. While still dominated by jars (n=1831; 88.5%), bowls (n=160; 7.7%) and other vessel forms (n=9; 3.8%) are evident as well. The type of temper used in ceramics is predominately shell (n=1802; 87.1%), with rock (n=211; 10.2%) and sand (n=49; 2.7%) constituting the remainder. Surface treatment of ceramics is mostly plain (83.9%) compared to cordmarked (15.6%). Combining temper and surface treatment data, most of the assemblage can be characterized as shell/plain (91.84%), with small amounts of shell/cordmarked (1.95%) and grit/plain (6.12%). It should be noted for both temper and surface treatment that older Woodland material was mixed into the Fort Ancient midden (Vickery et al. 2000), so the Fort Ancient assemblage may in reality be characterized by higher proportions of shell tempered plain ceramics. For this project, the mixed data were used to be conservative.

Approximately half of the rims/necks in the collection were decorated (45%). When decoration occurred, it was dominated by curvilinear (76.89%), rectilinear (10.79), and curvi-rectilinear (0.75%) guilloche motifs. Smaller numbers of line-filled triangle designs (6.18%) were also recovered. Four sherds (0.75%) were recovered that had Ramey-like Mississippian designs. Additionally, eight painted sherds (0.7%) were recovered. Appendages were dominated by strap handles (n=131; 87.92%), with a smaller number of lug handles (n=18; 12.08%).

In summary, despite destruction of many areas of the site, we know that State Line was a large, primarily early Fort Ancient site dated between AD 1050 and AD 1275 with wall-trench structures, plazas, and quite probably a circular design. The ceramic assemblage was predominately shell tempered vessels with plain or smoothed exteriors, which can be classified as the Mississippi Plain ceramic type. Although the assemblage is composed of mostly jars, bowls are also present in a high amount for an early Fort Ancient community. Vessel decoration is mostly guilloche patterns, with a small amount of Ramey-like and painted ceramics, pointing to connections with downriver polities. Cook (2008) has suggested that State Line may reflect a Mississippian enclave or
entropôt site.

**Turpin**

Major findings from Turpin, the focus of the present study, have been outlined in Chapter 7. Results as they pertain to this comparison will be reviewed. I have suggested that the site structure of Turpin reflects two small, circular communities. The first in the west is composed of at least six (and perhaps more than ten) structures. The second, in the east, is composed of at least four structures. Each demonstrates a circular orientation around a central communal area, which are interpreted here as plazas. In this sense, I have argued that these communities illustrate aspects of a Mississippian site grammar. The overall structure of the site may be oriented to the large burial mound at the site, but because of forest and a modern road, this is difficult to examine more broadly. Excavation of two structures in the present study provides the best data regarding household architecture at Turpin. House 1 is an approximately 6x4 meter structure constructed using wall trenches. Two evident occupations date between AD 1040-1088 and AD 1181-1265. House 2, which was only excavated in one dimension with a test trench, is a 4.5m wide structure also constructed using wall trenches and dates between AD 1206 and AD 1270.

The ceramic assemblages from the two houses are notably different. For this reason, House 1 and House 2 are treated separately for this analysis. The assemblage from House 1 contains 428 rims and 145 necks. Vessels from this context are primarily jars (86.2%), although bowls (11.9%) and other forms (1.9%) are also present. In general, these vessels are tempered with crushed mussel shell (97.2%) with small numbers of rock tempered sherds (2.8%). Vessels also primarily have plain surfaces (85.3%); cordmarking is less common (14.7%). Taken together, most vessels from House 1 are shell/plain (84.3%), with smaller numbers of shell/cordmarked (12.9%), rock/plain (1.0%), and rock/cordmarked (1.8%). Vessels from House 1 at Turpin are anomalous in the context of this study because they are infrequently decorated (9.2%). When decoration occurs, it is predominately curvilinear guilloche (94.3%), with smaller numbers of curvi-rectilinear guilloche (1.89%) and *Ramey-like* motifs (3.77%). All appendages from House 1 were strap handles.
The assemblage from House 2 contains 126 rims and 207 necks. Vessels from this context are primarily jars (85.9%), although bowls (12.2%) and other forms (1.9%) are also present. In general, these vessels are tempered with crushed mussel shell (95.8%) with small numbers of rock tempered sherds (4.2%). Vessels also primarily have plain surfaces (77.7%); cordmarking is less common (22.3%). Taken together, most vessels from House 2 are shell/plain (76.3%), with smaller numbers of shell/cordmarked (19.5%), rock/plain (1.4%), and rock/cordmarked (2.8%). Notably, the proportion of cordmarking is higher than in House 1. Decoration is relatively frequent in House 2 (44.8%). Decorative motifs are primarily curvilinear guilloche (78.9%), although line-filled triangles (14.4%) and rectilinear guilloche (4.4%) are also present. Appendage types are split between strap handles (84.6%) and loop/strap handles (7.6%).

**Thompson**

The Thompson site (15Gp27) is located in Greenup County, Kentucky, on a terrace of the Ohio River. Limited excavations suggest that it is a multi-component site containing both early and late Fort Ancient occupations (Henderson and Pollack 1992). Henderson (2008:826) classifies this site as an 'open habitation without mounds,' suggesting that Thompson reflects a significant habitation site. Excavations revealed a Late/Madisonville midden dated between AD 1300 and AD 1650, which overlies a 40-50cm thick early Fort Ancient midden dated between approximately AD 950 and AD 1228. Chronological understanding of these components is coarse, but at this point conclusions of an early and late Fort Ancient site are justified. Further work is necessary to confirm this, but for the present study, data will be used from the early Fort Ancient, or "Lower Thompson," component. Only four 2x2m units were excavated, so information regarding site structure and household architecture for this site is sparse.

Ceramic evidence from Lower Thompson is largely in accordance with the early Fort Ancient dates from this component. All vessels recovered were jars and were assigned to the Baum Ceramic Series, meaning they are similar to vessels found up the Scioto River in southern and central Ohio. This series is characterized primarily by rock tempered cordmarked ceramics, although does include some shell tempered plain vessels. This assemblage is dominated by Baum Cordmarked Incised (n=476), with smaller
amounts of Baum Shell Tempered Cordmarked (n=184), Baum Shell Tempered Plain (n=70), and Baum Plain (n=34). This breaks down into 61.6% grit tempered and 31.7% shell tempered, with 6.7% other temper types, and 86% cordmarked and 14% plain. Combined, the assemblage is 62.9% grit/cordmarked, 4.4% grit/plain, 23.2% shell/cordmarked, and 9.5% shell/plain. In terms of decoration, the majority of ceramics from Thompson are undecorated (91.2%), with only 8.8% exhibiting decoration. Evident designs are curvilinear guilloche (n=3; 37.5%) and line-filled triangles (n=5; 62.5%). A total of 11 appendages were recovered. Six (54.5%) were lug handles, three (27.3%) were loop handles, and 2 (18.2%) were strap handles.

In summary, limited excavations produced evidence of an early Fort Ancient component (referred to as Lower Thompson) dated between AD 950 and AD 1228. The assemblage is typical of the Baum Ceramic Series. It is composed of all jars and is dominated by grit-tempered, cordmarked ceramics. Decoration is rare, though when present it is most commonly line-filled triangles. Although limited, these data provide a means of comparing the lower component of Thompson with other early Fort Ancient sites.

Muir

The Muir site (15Js86) is located on a ridge in the Inner Bluegrass Region of Kentucky. Excavations were conducted in 1985 and encountered a total of four structures and 64 features, making it the best documented early Fort Ancient site in this region (Henderson 2008; Turnbow and Sharp 1988). As such, many broader interpretations of this time period stem from this site. Muir is a relatively well-dated site, although like many sites occupied in this time period, a plateau in the calibration curve increase date ranges. Taken together, the dates suggest an occupation somewhere between cal. AD 870-1300. The earliest dates come from two pit features, which together date between cal. AD 868-1162. In terms of residential contexts, Structure 1 most likely dates between cal. AD 966-1259 and Structure 4 dates between cal. AD 1047-1299. In general, these dates support ceramic evidence suggesting this site was occupied during the early Fort Ancient period.
Although excavations only targeted a few areas of the site, preliminary conclusions regarding site structure can be reached. Unlike some other Fort Ancient communities, Muir is not arranged circularly around a plaza, but instead it is organized linearly along the top of a ridge. In this sense, it is similar to the Killen Ridge and Grimes sites near the confluence of Brush Creek and the Ohio River (Brose 1982). Four structures and 44 features were excavated in what were interpreted as four habitation loci. The average house size ranges from 3.3x2.7 meters to 4.1x4.2 meters. These houses were placed in semi-subterranean basins and constructed using set-post architecture. No wall trench structures were encountered.

The ceramic assemblage of Muir was subject to thorough analysis, and includes 23,328 sherds, 489 of which are rims sherds (Turnbow 1988). Perhaps as a result of its location, much of the ceramic assemblage of Muir is dominated by limestone temper (86.5%), either alone or mixed, as a temper material. Considering temper in the simplified sense of this study, the majority of the ceramics here are tempered with rock (63.82%), with the rest tempered by shell (33.10%) or other materials (3.07%). In terms of surface treatment, most ceramics are cordmarked (77%), while a smaller amount are plain/smoothed (21.8%). Taken together, most of the ceramics are rock tempered/cordmarked (56.22%) and shell tempered/cordmarked (24.58%), with smaller amounts of rock tempered/plain (10.29%) and shell tempered plain (8.91%) ceramics. Decoration of ceramics was very rare (1.0%), and included primarily incised ceramic motifs that appear random and do not fit into conventional types (88.89%) (Turnbow 1988:119-120). A small number (11.11%) were interpreted as sections of line-filled triangles. Appendages at Muir are interesting. All of them are complete or partial strap handles (n=36). However, they appear to be a localized version of angular strap handles that have few regional analogs.

In summary, Muir is a well-studied early Fort Ancient community in the Inner Bluegrass Region of Kentucky. Four set-post structures, dating between roughly cal. AD 1000-1300, appear to be organized linearly along a ridge crest above a creek. The ceramic assemblage from this site is dominated by rock tempered, cordmarked ceramics that are mostly undecorated. The presence of maize and parts of discoidals at this site points to trade and/or connections with populations outside this region. The fact that the
designation of new ceramics series were necessary (Turnbow 1988), suggests that this site may have been located outside of the typical Fort Ancient sphere of influence. This may point to alternative influences, such as Eastern Tennessee, acted in this region or that Muir reflects a relatively isolated development.

Dry Run

The Dry Run site (15Sc10) is an upland site in the Bluegrass Region of Kentucky (Sharp 1984). On the basis of triangular Fort Ancient points and Late Woodland pottery, excavations were conducted in 1983 with the hope of examining the Late Woodland/Fort Ancient transition in this region. A total of 19 m² were excavated, revealing intact midden deposits, and one prehistoric feature. One radiocarbon date from this feature calibrates to AD 1039-1264. Based on five thermoluminescence (TL) dates of burned limestone and ceramics from the same context, the early Fort Ancient date appears accurate. No architectural remains were identified.

The ceramic assemblage includes 607 specimens from excavations and surface collections. This includes 26 rims and 11 angular shoulders. Four groups of ceramics are identified (Sharp 1984:111). Limestone tempered, cordmarked (54.5%) and limestone tempered plain (38.5%) represented the majority of the assemblage. Limestone/shell tempered (5%) and clay tempered plain (2%) sherds constitute the remainder of this assemblage. Appendages include one (50%) loop handle and one (50%) lug handle. No ceramics were decorated.

It must be noted that given the context of this assemblage (excavation and surface collection), some mixing of earlier and later ceramics may be possible. Dates are consistently in the late Late Woodland to early Fort Ancient periods, which could explain the predominance of rock temper and angular shoulders. The recovery of maize (18 kernels) strengthens the interpretation that this site has a Fort Ancient component, although maize has been recovered from Late Woodland sites in the region. This site is interpreted as a short-term, transitional site dated between AD 966 and AD 1299 and thus the assemblage should be useful for this comparison, both in characterizing early Fort Ancient in this area and in adding a 'hinterland' site to the comparison.
Comparing Early Fort Ancient Settlements

In order to characterize dynamics within and between sites occupied in the early Fort Ancient period, univariate and multivariate aspects of site characteristics and ceramic assemblages are examined. These analyses are largely inductive in that the goals are general characterization and pattern searching. Following this, correspondence analysis is used to examine relationships between aspects of early Fort Ancient ceramic assemblages.

Chronology

The sites in this sample were included because they were occupied during the early Fort Ancient period (Table 8.1; Figure 8.2). Of these, Guard, State Line and Muir appear to have been occupied solely during this early period. Turpin, as discussed earlier, has a significant Late Woodland component, but for this analysis only securely dated early Fort Ancient contexts were included. Thompson has a later Fort Ancient component referred to as 'Upper Thompson' (Henderson and Pollack 1992), but only the 'Lower Thompson,' or early Fort Ancient, assemblage was included in this analysis. Considered together, these six sites represent the only substantial well-dated early Fort Ancient contexts in this region.

Settlement Structure and Houses

Because the intensity and scope of fieldwork differs at the six sites in question, comparison of settlement structure and household architecture is difficult. I will discuss what is known, but more fieldwork is required at Thompson and Dry Run to confidently compare these sites. Summary data are presented in Table 8.2. In terms of site structure, it is now clear that the communities at Guard, Turpin, and State Line were organized circularly, around a central area likely reflecting a plaza. Each of these sites is approximately 4 hectares in size, although State line may be more in the range of 6 hectares (Vickery et al. 2000). Muir is arranged linearly along a ridge, with no evident plaza. This site is also estimated to be approximately 4 hectares in size. The similarity in size between these four sites may reflect community similarity; site location (i.e. floodplain vs. ridge top) could constrain community shape. Site structure for Thompson
and Dry Run are unknown, although these sites are thought to extend to two and one hectares, respectively.

In terms of household architecture, Guard, Turpin, and State Line again cluster in that each site has multiple wall trench structures (Cook and Genheimer 2015). Guard has at least three wall trench structures (Cook et al. 2015; Cook et al. n.d.), although this number will likely increase as more structures are investigated. Based on the present study and previous work (i.e. Metz 1885), there are at least six wall trench structures at Turpin. There are also wall trench structures at State Line, although the condition of the site prevents us from knowing how many. Based on partial wall segments encountered during salvage excavations, Cook and Genheimer (2015) suggest that a minimum of three to five wall trench structures were present at State Line. The remains of four houses were encountered at Muir, but all were set-post structures (Turnbow and Sharp 1988). Limited excavations at Thompson and Dry Run did not encounter the remains of any structures.

An additional informative characteristic is the presence or absence of mounds at these early Fort Ancient sites. Much like circular community structure and wall trench houses, Guard, State Line, and Turpin all have mounds associated with the communities. State Line had as many as six mounds, although because of looting and construction, their cultural affiliation is uncertain (Cook and Genheimer 2015). Guard is associated with two to three mounds (Cook et al. 2015), although at least one was likely related to the nearby Middle Woodland Jennison Guard site (see Kozarek 1997). Turpin has one Late Woodland stone burial mound, an early Fort Ancient burial mound with approximately 200 interments, and an additional mound of uncertain affiliation that was no longer evident by the mid-20th Century (as recorded by Metz in 1885). No mounds are evident at Thompson, Muir, or Dry Run.

Although preliminary and somewhat limited by available data, an important pattern is evident. Sites in the southwest of the study area (Guard, Turpin, State Line) share circular community patterns, a high frequency of wall trench structures, and each have associated earthen mounds. Taken together, these features are often cited as elements of a Mississippian site grammar (Lewis et al. 1998). Although less data are available for sites in northern Kentucky, these sites appear to reflect elements of a different system. If Muir is indicative of sites in this area, then a more Woodland system,
including linear communities and set-post structures, may have been in place south of the Ohio River.

**Ceramic Assemblages**

Ceramic assemblages from the six early Fort Ancient sites in this study will be compared based on temper and surface treatment (Table 8.3), assemblage composition and handle types (Table 8.4), and decoration (Table 8.5). These characteristics, while also readily available in many site reports, also create a general understanding of vessels within each assemblage. Considering the different amounts of fieldwork that has been conducted at these sites, comparisons will be made based on the relative proportions of each element.

**Temper and Surface Treatment**

Two groups are evident in regard to the tempering materials used in ceramics (Figure 8.3). The first group includes State Line, Turpin 1 (House 1), Turpin 2 (House 2), and Guard. Vessels from each site were tempered almost exclusively with crushed shell. At Guard, Turpin 1 and Turpin 2, over 95% of vessels were tempered with shell. State Line's assemblage was composed of 87.1% shell-tempered vessels, although Vickery et al. (2000) note that this includes mixed Late Woodland (rock tempered) vessels. It is likely that Fort Ancient contexts from this site exhibited shell tempered vessels in line with the other three sites in this group. The second group includes Muir, Lower Thompson, and Dry Run. Vessels from each site in this group were primarily (>60%) tempered with crushed rock. Both Muir and Lower Thompson have an approximate ratio of 2:1 of rock:shell tempered vessels. Vessels from Dry Run are almost all (93%) tempered with crushed rock.

In terms of surface treatment, three groups are evident (Figure 8.4). The first includes State Line, Turpin 1 and Turpin 2. Vessels at these sites primarily (>75%) have plain surfaces. In the second group, the ratio of plain to cordmarked vessels is approximately equal. This group includes Guard and Dry Run. In the final group, which includes Muir and Lower Thompson, cordmarked vessels comprise at least 77% of the assemblage.
Considered together, temper and surface treatment are valuable traits for understanding ceramic assemblages. In the case of the six sites (and seven assemblages) analyzed here, two primary groups stand out (Figure 8.5). The first, which includes State Line, Turpin 1, Turpin 2, and Guard, is marked by plain, shell tempered vessels. This type fits well with the criteria for Mississippi Plain pottery (Hilgeman 2000; McGill 2013; Philips 1970). Guard stands as a slight exception for now, as noted above. Each of these assemblages has at least 55% plain/shell tempered ceramics. The second group, including Muir, Lower Thompson, and Dry Run, are dominated by rock tempered cordmarked vessels. In each site, these vessels constitute at least 54% of the assemblage.

Decoration
The presence of decoration divides the sites in this analysis into two groups (Figure 8.6). The first group, including State Line, Turpin 2, and Guard, is marked by approximately half of available rims and necks exhibiting decoration. The assemblages from State Line and Turpin 2 are almost identical in terms of the proportion of decorated vessels. Turpin 1, Muir, Lower Thompson, and Dry Run form the second group, in which decorated vessels are rare (<10%). This group can be further broken into those sites in which approximately 10% of the assemblage is decorated (Turpin 1 and Lower Thompson) and those which have essentially no decoration (Muir and Dry Run). This delineation seems most meaningful, as is differentiates geographically between sites on the Ohio River and those in the uplands of Kentucky. It is possible that the inclusion of Turpin 1 in this group is misleading. I have made the argument that this assemblage reflects a Mississippian occupation and most Mississippian sites have relatively few decorated vessels (Hilgeman 2000). In this sense, Turpin 1 can be classified as its own group, while the lack of decoration at Muir, Lower Thompson, and Dry Run may reflect more Woodland assemblages. I only make this differentiation based on the assemblages as wholes.

The types of decoration at these sites are also important to consider, although Dry Run falls out of this comparison because it produced no decorated sherds (Figure 8.7). Again, two groups are evident. The first, which includes State Line, Turpin 1, Turpin 2, and Guard, is overwhelmingly dominated by curvilinear guilloche patterns, which
constitute over 60% of identifiable decorations in each assemblage. Notable within this group is that all but Turpin 1 produced other decoration types; Turpin 1 is solely curvilinear patterns along with Ramey or Ramey-like designs. The second group, which includes Muir and Lower Thompson, has higher incidences of line-filled-triangle motifs than other sites, but are otherwise different. Muir has a large number of sherds with unidentifiable incised lines described as "more or less random scratching" (Turnbow and Sharp 1988:119). Lower Thompson is interesting for is relatively high proportion of curvilinear guilloche patterns, but the sample of decorated sherds from this site is low (n=48 [6.2%]), so this pattern may not reflect the site as a whole.

Assemblage Composition and Vessel Handles

In regard to the types of vessels in each assemblage, two groups are evident: those sites that have produced forms other than jars, and those that have only jars (Figure 8.8). In this first group, State Line, Turpin 1, Turpin 2, Guard, and Muir all produced bowls. With the exception of Guard (2.5%), bowls constituted approximately 10% of these assemblages. State Line, Turpin 1, Turpin 2, and Guard also produced small numbers of plate fragments. The assemblages from Lower Thompson and Dry Run produced evidence of only jars.

The types of handles present on vessels from the sites in question result in the same two clusters as were evident when considering vessel diversity (Figure 8.9). First, State Line, Turpin 1, Turpin 2, and Guard are all dominated by strap handles. Of these, Guard has the most diversity in handle forms, but over 80% are still strap handles. It should be noted that the strap handles from Muir were crude and included angular forms not identified elsewhere in the study area (Turnbow and Sharp 1988:115). The second group consists of Lower Thompson and Dry Run, which have higher proportions of lug and loop handles than any other site in this analysis.

Correspondence Analysis - early Fort Ancient

In order to examine the composition of early Fort Ancient ceramic assemblages in multivariate space, assemblages were examined based on relative frequencies of four general categories. Temper, surface treatment, assemblage decoration, and the proportion
of jars to bowls are general enough variables to be available in published reports but still meaningfully characterize site-level ceramic production. Because of dramatic discrepancies in the amounts of ceramics recovered from the sites in question, percentages were used. It is assumed that excavated collections reflect representative samples from each site; future work at these sites can help clarify the preliminary relationships identified here.

The correspondence analysis resulted in six dimensions, the first two of which account for 85.5% of the variation exhibited between sites and ceramic assemblages. The first dimension, which constitutes 68.9% of variation, is best characterized by differences in temper. Variables that load positively on this dimension include rock/plain and rock/cordmarked ceramics. Variables that load negatively on this dimension are shell/plain and to a lesser extent shell/cordmarked ceramics. Decoration on vessels also loads negatively; this is likely because decoration on rock tempered vessels is extremely rare. The second dimension, which constitutes 16.6% of the variation, is characterized by vessel surface treatment and decoration. In particular, variables that load positively on this dimension include shell/plain ceramics and higher proportion of bowls in the assemblage. In essence this can be considered a 'Mississippian' variable. Variables that load negatively on the second dimension are decoration and shell/cordmarking. This aspect of dimension two essentially serves to differentiate Guard from other Miami Valley Fort Ancient sites.

Based on these ceramic characteristics, three clusters of sites/traits are evident (Figure 8.10). The first cluster is composed of sites from south of the Ohio River, including Muir, Dry Run, and Thompson. These sites correspond based primarily on the prevalence of rock tempered ceramics. Vessels from these sites were primarily tempered with rock, whether or not vessel surfaces were plain or cordmarked. Additionally, assemblages from these sites were comprised primarily of jars and were less frequently decorated than those from other sites in the study. In essence, this cluster is marked by what many consider more local traditions of ceramic production, which includes rock tempering and cordmarking.

The second cluster contains only the Guard site. The assemblage from Guard is separated by a high prevalence of shell/cordmarked vessels and a high rate of decoration,
traits which no other site in this sample shares. In this sense, it is similar to later Turpin Phase villages in this region (e.g., Cowan 1987; Cowan et al. 1990). It should be noted that data used in this analysis are only from 2012 excavations. More recent work conducted by Cook, myself, and others (Cook et al. n.d.) suggests that many features in the central plaza area contain shell/plain vessels. However, these have not been formally analyzed yet. It is expected that once these are analyzed and incorporated into the correspondence analysis, Guard will cluster with Turpin and State Line.

The third cluster is composed of sites in the lower Miami Valleys. The assemblages from Turpin 1 (House Block 1), Turpin 2 (House Block 2), and State Line all correspond well with one another. Notably, the characteristics that contribute to this correspondence are a high proportion of bowls in the assemblage and a predominance of shell/plain ceramics. In a general sense, these are more Mississippian-like ceramic assemblages. Within this cluster, Turpin 1 stands apart from Turpin 2 and State Line. This is influenced by the proportion of bowls in Turpin 1 and less so by a general tendency of vessels from Turpin 1 to be undecorated. As such, the assemblage from Turpin 1 most closely approximates Mississippian assemblages. This will be further tested below.

Overall, this exploratory examination has identified a separation between early Fort Ancient sites in the Miami Valleys and sites in Kentucky. The primary distinction is between assemblages that are dominated by shell tempering and those that are composed of primarily rock tempered vessels. These differences suggest that different systems were working within the broader heading of the early Fort Ancient period.

**Summary**

In comparing patterned variation in site structure and ceramic assemblages from the six best studied early Fort Ancient sites in the Middle Ohio Valley, two general groups of sites became evident. The first group includes State Line, both Turpin settlements identified in this study, and Guard. Each of these sites is circular, arranged around a central plaza, contains wall trench houses, and is associated with at least one mound. Ceramic assemblages from these sites are generally shell tempered and have a high proportion of shell tempered vessels with plain surfaces. With the exception of
Turpin 1, approximately half of the vessels in these assemblages are decorated; curvilinear guilloche was the motif of choice at these sites. Additionally, these sites are marked by a small but notable proportion of bowls (2-12%). When appendages are present, they are almost always strap handles.

The second group includes Muir, Lower Thompson, and Dry Run. The structure of these sites is less clear, considering excavation at Thompson and Dry Run consisted of test units that did not encounter architectural features. If Muir reflects early Fort Ancient site structure in northern Kentucky, these sites are more arranged in a linear pattern and consist of set-post structures. The ceramic assemblages from these sites are mostly made up of rock tempered cordmarked jars with little decoration. When decoration is present, it is either indeterminate incising, or a mix of curvilinear guilloche and line-filled triangle motifs. With the exception of Muir, bowls are not present in this group.

The assemblages from these two groups are distinctly different. The sites themselves are geographically clustered. Sites from the first group, with shell/plain vessels, bowls, and decoration, are located in the lower Miami Valleys. Sites from the second group, with rock tempered cordmarked jars and little decoration are located in northern Kentucky. This geographic pattern fits well with Griffin (1943) and Cowan (1987), who suggested that sites in the southwest of the Fort Ancient region exhibit more Mississippian assemblages. Sites further from this area appear to exhibit mixed Mississippian and Woodland traits, a finding that supports Essenpreis' (1978) consideration of two systems working within the broader Fort Ancient region.

**Mississippian Connections**

The third scale of analysis in the present study seeks to consider the placement of Turpin and sites from the early Fort Ancient period within the broader early Mississippian system. In the previous section, I suggested that there is a geographic discrepancy between early Fort Ancient sites in the Middle Ohio Valley. In the southwest portion of this region, circular villages with wall trench structures have ceramic assemblages that appear very Mississippian. Sites in northern Kentucky are harder to classify, but appear to be more Woodland in both site organization and the nature of the ceramic assemblage. In order to consider the relationship between contemporary early
Fort Ancient and Mississippian sites, four Mississippian sites are added to the comparison. These sites include Prather and Angel, which are down the Ohio River from Fort Ancient sites, as well as Hiwassee Island in Tennessee, and Annis in west/central Kentucky.

Comparing Early Mississippian and Fort Ancient Settlements

Chronology

The time period between AD 1000 and AD 1300 was a time of change and cultural florescence in the American Midcontinent (e.g., Pauketat 2007). To understand this period better, a tight control of chronology is necessary. Radiometric dates from the six early Fort Ancient sites in this study were presented in the preceding section. These sites were primarily single occupations and presented relatively easy interpretation. The early Fort Ancient components of these sites spanned from approximately AD 1000 to AD 1300. Larger Mississippian sites, like those included in this analysis, were occupied more intensely and have complex histories. However, examining these sites within the context of early Mississippian developments is necessary to understand this time period.

The first thing to note in this regard is the timing of the early Fort Ancient emergence within the context of Mississippian development in the American Bottom. The height of Cahokia took place during the Lohmann (AD 1050-1100) and Stirling (AD 1100-1200) phases of the American Bottom sequence. During this time, enclaves and peripheral mound centers and small communities exhibiting Cahokian characteristics were established throughout the Midwest and Southeast (e.g., Pauketat 2007). Between AD 1200 and AD 1275, changes at Cahokia resulted in depopulation of outlying areas and a decline of population in the American Bottom region (e.g., Benson et al. 2009).

In the Lower Ohio Valley, large mound centers like Kincaid and Angel, and smaller centers like Prather were founded concurrent with Cahokia's rise. The Angel site has a long history and a complex chronology (see Monaghan et al. 2013). It is typically considered the furthest northeast extension of classic Middle Mississippian (see Griffin 1967, Figure 5). When considering the chronology of mound building at Angel, Monaghan et al. (2013) suggest that mound construction was one of the first actions at Angel, dating between AD 1050 and 1080. They suggest that mound building continued
through the long history of this polity, which was eventually abandoned by AD 1450. Ceramic data used in the present study come from both Black's (1967) original site report as well as Hilgeman's (2000) study of ceramics from the Angel site.

The Prather site only has one radiometric date that has been published at present. This date, which calibrates to AD 988-1276, was sampled from a wall trench structure (Munson and McCullough 2004). This range fits well with an early Mississippian occupation. Further archaeological and chronological work is required, however, to support this limited interpretation. Work on this site is less far along than most sites in this sample, considering data come from an auger survey of the site. Ceramic data for the present study come from Munson and Mucullogh's (2004) analysis of survey data.

The Annis village and mound complex is located on the Green River in Western Kentucky. It was excavated primarily as a part of a WPA project in 1939-1940 and includes a village of wall trench structures and a large mound with sub-mound wall trench and set-post structures (Hammerstedt 2005). Although early chronologies placed the occupation of Annis between AD 900 and AD 1450, Hammerstedt (2005) suggests that the occupational span is more likely between AD 1000 and AD 1450. Ceramics recovered from WPA are used in this analysis, although Hammerstedt (2005) makes the distinction that grog tempered sherds reflect the Late Woodland occupation and shell tempered sherds reflect the Mississippian occupation. For this reason, data for shell tempered ceramics are used in the present study.

The Hiwassee Island site is located in southeastern Tennessee and is on an island on the Tennessee River. It is one of the best understood sites in this region and a seminal report on the material culture from this site has become foundation for understanding Mississippian occupation in east Tennessee (Lewis and Kneberg 1979). The site itself was occupied through the Late Woodland (Hamilton Phase) and has both early (Hiwassee Island Phase) and middle (Dallas Phase) Mississippian occupations. These phases date from AD 1000 to AD 1300 and AD 1300 to AD 1600, respectively (Schroedl 1998). Numerous mounds and wall trench structures were excavated at the site, along with complex structures on mound strata. Because ceramics in the Hiwassee Island and Dallas Phases differ significantly (see Lewis and Kneberg 1979), the present study relies primarily on ceramics evidence from the earlier Hiwassee Island phase.
Ceramic Assemblages

Ceramic assemblages are compared based on temper, surface treatment, assemblage composition, handle types, and decoration. These characteristics create a general understanding of vessels within each assemblage. Considering the different amounts of fieldwork that has been conducted at these sites, and the sheer amounts of artifacts recovered from sites like Angel (e.g., Black 1967), comparisons will be made based on the relative proportions of each variable.

Temper and Surface Treatment

Comparing the ten sites in question in terms of temper produces two categories (Figure 8.11). The first includes Hiwassee Island, Annis, Angel, Prather, Guard, State Line, Turpin 1 and Turpin 2. These sites are marked by a predominance of shell tempered vessels. All assemblages in this group are comprised of at least 87% shell tempered vessels, although because of issues at State Line (noted above), this minimum is likely much higher. The second group consists of Muir, Lower Thompson, and Dry Run, the assemblages of which are dominated by rock tempered vessels. In essence, early Fort Ancient assemblages in the lower Miami Valleys are more like contemporary Mississippian sites in regard to temper than they are other early Fort Ancient sites in the Middle Ohio Valley.

The same groupings are evident in terms of surface treatment (Figure 8.12). In the first group, plain/smoothed surfaces constitute the majority (>77.7%) of each assemblage, with the exception of Guard (46%). Cordmarked surfaces are comparatively rare. In the second group, vessels with cordmarked surfaces make up over 54% of each assemblage. Sites in the lower Miami Valleys have assemblages with higher proportions of smoothed vessels, while cordmarking is more common in northern Kentucky sites.

When considered together, temper and surface treatment variables are informative. Not surprisingly, two groups are evident here (Figure 8.13). The first group includes Hiwassee Island, Annis, Angel, Prather, State Line, Turpin 1, Turpin 2, and Guard. Assemblages from these sites are marked by a majority (>80%) of shell tempered plain ceramics, with the exception of Guard (55%). At sites like Angel, Annis, and Hiwassee Island, this is not surprising; these Mississippi Plain ceramics are considered a
utilitarian type at such sites. What is surprising given prevailing typologies in the Middle Ohio Valley is that early Fort Ancient sites in the lower Miami Valleys also have a majority of these Mississippi Plain ceramics. The second group, including Muir, Lower Thompson, and Dry Run, has assemblages in which a majority of vessels are rock tempered and cordmarked. Muir and Lower Thompson have shell tempered plain ceramics, but these are a minority (<10%) in each assemblage.

**Vessel Types, Decoration, and Appendages**

The diversity of vessels at the sites in this analysis suggests that two types of sites exist: those with jars, bowls, plates, pans, and other forms, and those with only jars (Figure 8.14). In the latter category, Lower Thompson and Dry Run have only jars. This may be a result of limited fieldwork or it could reflect the site assemblages. All other sites have at least jars and bowls (Prather, Hiwassee Island, Muir) or jars, bowls, and other vessel forms (Annis, Angel, State Line, Turpin 1, Turpin 2, and Guard). It is surprising, based on other traits, that Muir is included in this group.

Whether or not decoration is present in an assemblage is important. When decoration is considered in the sites in this analysis, two groups emerge (Figure 8.15). Approximately half of vessels in the first group, which includes State Line, Guard, and Turpin 2, exhibit decoration. Ceramic vessels in the second group rarely (<10%) exhibit decoration. This group can be further divided into those sites exhibiting Mississippian characteristics and undecorated vessels (Annis, Prather, Angel, Hiwassee Island, and Turpin 1) and those sites in which vessels are undecorated but other Mississippian characteristics are rare or nonexistent (Muir, Thompson, and Dry Run). This delineation may reflect the difference between Mississippian sites and those exhibiting more Woodland characteristics.

The types of appendages are the most variable traits analyzed at this scale (Figure 8.16). When considered as a whole, two groups are evident. The first, including, State Line, Guard, Turpin 1, Turpin 2, and Muir, are those sites in which strap handles constitute the majority of appendages in the assemblage. In each of these assemblages, strap handles represent over 80% of recovered handle forms. At Turpin 1 and Muir, strap handles were the only form recovered. The second group is more variable in terms of
appendage forms. Annis and Angel, each have strap handles, lug handles, loop handles and nodes. Angel also has a small number of tab appendages. Thompson and Dry Run each have primarily lug and loop handles, while Thompson also has strap handles. The meaning behind the patterns evident in this two groups is unclear, although it seems apparent that strap handles are a predominantly Fort Ancient appendage. This may be linked to stylistic bottlenecks sometimes associated with migrating groups (Anthony 1990:903).

Correspondence Analysis - early Mississippian

In order to broaden the comparison of ceramic assemblages across the Midcontinent, the four early Mississippian sites described above were added and compared using the same variables as were used for the early Fort Ancient comparison. These sites range from western Kentucky and Tennessee to southern Indiana and provide a broad, albeit limited, geographical overview of ceramic patterning. Consideration of early Mississippian ceramic assemblages through use of correspondence analysis reveals the presence of three clusters (Figure 8.17).

The correspondence analysis resulted in seven dimensions, the first two of which account for 86.4% of the variation exhibited between sites and ceramic assemblages. The first dimension, which constitutes 55.4% of variation, and is best characterized by differences in temper and surface treatment. Variables that load positively on this dimension include rock/plain and rock/cordmarked ceramics. Variables that load negatively on this dimension are shell/plain and to a lesser extent decoration on vessels. The second dimension, which constitutes 31.0% of the variation, is characterized by shell/cordmarked vessels and decoration. In particular, variables that load positively on this dimension include shell/plain ceramics, a lack of decoration, and higher proportion of bowls in the assemblage. In essence this can be considered a ‘Mississippian’ variable. Variables that load negatively on the second dimension are decoration and shell/cordmarking. This aspect of dimension two essentially serves to differentiate Guard from other sites in this sample.

The first cluster reflects Fort Ancient sites in northern Kentucky. Again, Thompson, Muir, and Dry Run stand apart from other sites in the analysis because
crushed rock was used as the dominant tempering agent. These assemblages are comprised almost solely of jars and are less frequently decorated. In essence, these assemblages, with some exceptions, are similar to the Late Woodland rock tempered cordmarked ceramics that predate Fort Ancient in this region.

The second cluster includes assemblages from traditionally classified Mississippian sites, including Hiwassee Island, Angel, Prather and Annis. This cluster also includes House 1 from Turpin. These sites correspond based on similar proportions of shell/plain (or Mississippi Plain) ceramics, a higher proportion of bowls in the assemblage, and a higher rate of undecorated ceramics. In essence, ceramic assemblages in this cluster reflect what are typically considered Mississippian characteristics.

The third cluster reflects a tight grouping of State Line and House 2 at Turpin, suggesting the ceramic assemblages from these sites are nearly identical at this fundamental level. These sites could be grouped within the broader Mississippian cluster identified above based on the proportion of shell/plain ceramics and bowls within the assemblage. Vessels from State Line and Turpin 2 are distinct from these Mississippian sites, however, in that they are more highly decorated and contain some shell tempered cordmarked vessels.

The assemblage from Guard is again in its own space. This site is separated based on a high prevalence of shell/cordmarked vessels and a high rate of decoration, traits which no other site in this sample shares. It should be noted that data used in this analysis are only from 2012 excavations (Cook et al. 2015). More recent work conducted by Cook, myself, and others (Cook et al. n.d.) suggests that many features in the central plaza area contain shell/plain vessels. However, these have not been formally analyzed yet.

This analysis suggests that when viewed within the broader perspective of the Mississippian system, the ceramic assemblages from early Fort Ancient sites fall within two categories. The first type, located primarily in the lower Miami Valleys, fits well with assemblages from Mississippian sites in Indiana, Tennessee, and Western Kentucky. The second type, located primarily in northern Kentucky, appears reflect a more localized Late Woodland system with some Mississippian additions like small amounts of shell tempering.
Summary

In this chapter I have increased the scope of analysis on two levels. First, I placed findings from Turpin within the early Fort Ancient system. By examining univariate aspects of chronology, site structure, and ceramic characteristics coupled with a multivariate exploration of ceramic assemblages, I have suggested that two groups of early Fort Ancient sites are evident in this region. The first group is geographically confined to the lower Miami Valleys and includes State Line, Guard, and the two Turpin houses discovered as part of the present study. These sites are large (~4 hectares), circularly organized around plazas, and were composed primarily of wall trench structures. The ceramic assemblages of these sites consist of vessels that are primarily shell tempered with plain surfaces and are often decorated. Sites within this group have also produced numerous Mississippian artifacts. The second group of sites includes Lower Thompson, Muir, and Dry Run, located in the Bluegrass and northern regions of Kentucky. These sites tend to be smaller (~1-4 hectares), and at least Muir is organized linearly along a ridge top and has set-post structures. The ceramic assemblages from these sites consist of primarily rock tempered cordmarked vessels with little decoration.

To examine broader relationships, I increased the scope of analysis further to examine the relationship of early Fort Ancient sites within the broader early Mississippian system. Adding Annis, Hiwassee Island, Angel, and Prather into the comparison allows for an understanding of how early Fort Ancient sites related to contemporary Mississippian sites throughout the Midcontinent. Again, two groups were evident. The first includes the four Mississippian sites, as well as State Line, Turpin 1, Turpin 2, and Guard. Multivariate analysis suggests that Turpin 1 in particular is almost indistinguishable from Mississippian sites in terms of ceramic assemblages. In many ways, these sites are similar to small Mississippian communities throughout the Midcontinent. The second group is again composed of Muir, Lower Thompson, and Dry Run, which stand out for their small size, lack of wall trench structures, and rock tempered cordmarked ceramics.

Findings at these scales fit well with suggestions from Griffin (1943) and Cowan (1987) that the southwestern portion of the Middle Ohio Valley was markedly more
Mississippian than other areas. This pattern is also consistent with Essenpreis’ (1978) idea that there may have been two systems working within the Fort Ancient region: a more Mississippian 'core' and peripheral sites that reflected Woodland/Mississippian hybridization. At a broader scale, the fact that those sites closer to Mississippian centers reflect stronger similarities with Mississippian groups is reminiscent of a Neolithic pattern of movement up river valleys (e.g., Davison et al. 2006). Hybridization of local communities with an influx of nonlocal people is also consistent with migrant/local interaction in Neolithic settlings (Zvelebil 2000). Overall, this chapter has helped to place Turpin within a broader spatial and social context of early Fort Ancient communities, and then placed these communities within a broader context of Mississippian development. Using nested scales of analysis to examine connections at increasing levels helps to understand the interplay between community-level and regional dynamics.
Chapter 8 Figures

Figure 8.1: Map of sites used in analysis

Figure 8.2: Summed radiometric dates from early Fort Ancient sites
Figure 8.3: Ceramic temper at early Fort Ancient sites

Figure 8.4: Ceramic surface treatment at early Fort Ancient sites

Figure 8.5: Combined ceramic temper and surface treatment data for early Fort Ancient sites
Figure 8.6: Presence/Absence of decoration at early Fort Ancient sites

Figure 8.7: Decoration types evident at early Fort Ancient sites. CG=curvilinear guilloche; RG=rectilinear guilloche; C-RG=curvi-rectilinear guilloche; LFT=line-filled triangles

Figure 8.8: Assemblage diversity at early Fort Ancient sites.
Figure 8.9: Appendage types recovered from early Fort Ancient sites

Figure 8.10: Correspondence Analysis results for early Fort Ancient assemblages.
Figure 8.11: Ceramic temper from all sites

Figure 8.12: Ceramic surface treatment from all sites

Figure 8.13: Combined ceramic temper and surface treatment from all sites
Figure 8.14: Ceramic assemblage diversity from all sites

<table>
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<tr>
<th>Site</th>
<th>Jars</th>
<th>Bowls</th>
<th>Other</th>
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<td>Prather</td>
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<td>91</td>
<td>87</td>
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<tr>
<td>Angel</td>
<td>96</td>
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<td>85</td>
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Figure 8.15: Presence/absence of decoration on ceramics from all sites

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<td>18</td>
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<td>35</td>
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<td>91</td>
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Figure 8.16: Ceramic appendages recovered from all sites

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Figure 8.17: Correspondence analysis of ceramic assemblages for all sites
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<th>Error</th>
<th>Calibrated Range (AD) (2-sigma)</th>
<th>Citation</th>
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<td>80</td>
<td>868-1217</td>
<td>Turnbow and Sharp 1988</td>
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<tr>
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<td>60</td>
<td>1050-1083 (3.1%); 1126-1136 (0.7%); 1151-1303 (90.1%); 1367-1383 (1.5%)</td>
<td>Turnbow and Sharp 1988</td>
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<td>60</td>
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<td>60</td>
<td>1039-1264</td>
<td>Sharp 1984</td>
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<td>70</td>
<td>988-1276</td>
<td>Munson and McCullough 2004</td>
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Table 8.1 - Radiometric dates from early Fort Ancient sites in the study region
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<tr>
<th>Site</th>
<th>Cal. Date Range (AD)</th>
<th>Site Type</th>
<th>Community Structure</th>
<th>Estimated site size (ha)</th>
<th>Wall Trenches? (#)</th>
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<tr>
<td>Guard</td>
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<td>Habitation with mounds</td>
<td>Circular; plaza</td>
<td>3</td>
<td>Present (min. 3)</td>
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<td>Habitation with mounds</td>
<td>Circular; plaza(s)</td>
<td>4-6</td>
<td>Present (min. 3)</td>
</tr>
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<td>1050-1275</td>
<td>Habitation with mounds</td>
<td>Circular; plaza(s)</td>
<td>4</td>
<td>Present (min. 9)</td>
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<tr>
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<td>870-1300</td>
<td>Habitation - no mounds</td>
<td>Linear</td>
<td>3.8</td>
<td>Absent (4 set-post structures)</td>
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<td>960-1275</td>
<td>Habitation - no mounds</td>
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<td>Habitation - no mounds</td>
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<td>Unknown</td>
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<td>Town/small mound center</td>
<td>Circular</td>
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<td>Present (min 1)</td>
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<td>Town/mound center</td>
<td>Complex</td>
<td>40</td>
<td>Present (numerous)</td>
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<td>1000-1300 (Hiwassee Island Phase)</td>
<td>Town/mound center</td>
<td>Complex</td>
<td>Indet.</td>
<td>Present (numerous)</td>
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<td>Town/mound center</td>
<td>Semi-circular</td>
<td>Indet.</td>
<td>Present (min 10)</td>
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Table 8.2: Summary site structure and habitation data for early Fort Ancient and select Mississippian sites

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<th>Site</th>
<th>Percent Shell Temper</th>
<th>Percent Rock Temper</th>
<th>Percent Plain</th>
<th>Percent Cordmarked</th>
<th>Shell/Plain</th>
<th>Shell/Cordmarked</th>
<th>Grit/Plain</th>
<th>Grit/Cordmarked</th>
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<td>46.6</td>
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<td>91.84</td>
<td>1.95</td>
<td>6.21</td>
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<td>2.8</td>
<td>85.3</td>
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<td>77.7</td>
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Table 8.3: Ceramic temper and surface treatment data for early Fort Ancient and select Mississippian sites
<table>
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<th>Site</th>
<th>Percent Jars</th>
<th>Percent bowls</th>
<th>Percent Strap Handles</th>
<th>Percent Lug Handles</th>
<th>Percent Loop Handles</th>
<th>Percent Loop/Strap Handles</th>
<th>Percent Nodes</th>
<th>Percent Tabs</th>
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<table>
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<th>Percent Curvilinear Guilloche</th>
<th>Percent Rectilinear Guilloche</th>
<th>Percent Curvi-Rectilinear Guilloche</th>
<th>Percent Line-filled Triangle</th>
<th>Percent Ramey</th>
<th>Percent Other</th>
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<th>Percent Rectilinear Guilloche</th>
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<th>Percent Line-filled Triangle</th>
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<td>-</td>
</tr>
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Table 8.4: Ceramic assemblage composition and handle types for early Fort Ancient and select Mississippian sites

Table 8.5: Ceramic decoration for early Fort Ancient and select Mississippian sites
Chapter 9: Discussion

This study is framed around four primary research questions organized in a multiscalar framework. First: what is the nature of early Fort Ancient occupation at Turpin and how does it relate to the preceding Late Woodland component? Second: What is the tempo and mode of early Fort Ancient village development and how does Turpin fit into this picture? Third: what, if any, influence did Mississippian societies have on the emergence of village life in the Middle Ohio Valley? Fourth: how did changes in regional climate systems influence human behavior and cultural change in the Middle Ohio River Valley in the late Holocene? In this section, I revisit each question, summarizing findings and elaborating on patterns identified in this project. I also revisit the archaeological expectations of migration set up in Chapter 2 and test findings from this study.

Late Woodland and Fort Ancient Occupation at Turpin

When this project began, Turpin was assumed to represent the remains of at least two villages, one Late Woodland and one Fort Ancient. Generally accepted models for the region suggest that the transition to village life took place gradually (Pollack and Henderson 1992; 2000; Pollack et al. 2002). In regard to the Fort Ancient aspect of the site, Griffin (1943) suggested that the site belonged to the Madisonville Focus, now held to be a late (post-AD 1400) period in the Fort Ancient sequence. Drooker suggested that two Fort Ancient occupations were evident, spanning from 1000 to 1600. My primary research question focused on the nature of Late Woodland and Fort Ancient occupation at Turpin, and how these components were related, if at all. New data have been gathered through re-examination of previous excavation records, site structure surveys, and targeted excavations of prehistoric structures to begin addressing these questions. A summary of major findings starts with what we now confidently know about the Late
Woodland occupation of Turpin. Then, an overview of findings regarding the Fort Ancient settlements is provided. Finally, evidence of connections between these two occupations is evaluated.

The Late Woodland at Turpin

Based upon initial reexamination of excavations by the CMNH, it is unclear if a series of postmolds below the Fort Ancient burial mound are evidence of a Late Woodland village as suggested (Griffin 1952; Oehler 1973), or a mortuary feature related to the mound like those found in Illinois (Douglas 1976) and Wisconsin (Price et al. 2007: Figure 4). There is unequivocally Late Woodland material at the site, including the stone burial mound and extensive organic middens with associated rock tempered ceramics, but given the data available evidence of a village is lacking. This may seem like a step backwards, but reassessing tenuous interpretations will help clarify the nature of Late Woodland activities at Turpin. One potential issue that must be considered is the conflation of early (c. AD 400-700) and late (c. AD 700-1000) Late Woodland into a monolithic 'Late Woodland' occupation. Indeed, dates span from AD 400-1000, suggesting that complex developments during the Late Woodland period played out at Turpin. Parsing such differences will take considerable effort, considering multiple independent occupations of the landform likely occurred during this period. Aside from this skepticism, three findings from the present study provide evidence toward addressing this issue.

First, I remapped the findings of the Cincinnati Museum of Natural History excavations in order to better understand the relationship between the Late Woodland 'village' and Fort Ancient mortuary contexts. As noted in Chapter 6, the structure encountered at the base of multiple middens, originally interpreted as a Late Woodland house, was adjacent to the Fort Ancient burial mound. Additionally, the remains of multiple additional structures were evident once all excavation blocks were mapped. I have tentatively interpreted these new findings as potential evidence of mortuary preparation facilities related to the Fort Ancient mound. This hypothesis removes architectural evidence of a Late Woodland village from the site.
Second, the site structure survey covered in Chapter 6 produced two potentially informative lines of evidence. The prevalence of rock-tempered ceramics, which we now know to be rare in Fort Ancient contexts, can provide insight into Woodland contexts. It is unclear at this point if patterned chronological differences exist between igneous and limestone forms of rock temper. Examining the areas of the site in which rock temper is dominant over shell temper (Figure 9.1) suggests that these the central and far eastern portions of the landform may have been loci of Late Woodland activity. Additionally, the deepest levels of the magnetic susceptibility survey were most positive around the central portion of the landform (see Figure 6.24). Although this could reflect deep Fort Ancient deposits, coupled with the ceramic temper data from above, it is likely that these deep central areas reflect Late Woodland occupation. Notably, this area is adjacent to excavations by Oehler (1973) and Riggs (1998) that recovered evidence of domestic activity. Riggs (1998) dated carbon in a post to AD 710-1021, suggesting that this area may have been occupied during the late Late Woodland period. This area will be examined in future field seasons.

Third, explorations in all four excavation areas encountered Late Woodland midden (Test Unit 16; House Block 1) or features (Test Unit 2; House Block 2). Perhaps informatively, midden was encountered in the western portion of the landform, while features were encountered in the eastern portion. In Test Unit 1 and House Block 1, each structure was found to have been dug into a preexisting midden that is Late Woodland in origin. In each case, the midden was darker (more organic) than the Fort Ancient feature, and contained small, broken, primarily rock tempered ceramics. In Test Unit 2 and House Block 2, features that were Late Woodland in origin were encountered, without identifiable sheet midden deposits. Each feature appears to be an earth oven, or the remnants of hot rock cooking. Although the sample size is obviously small, this may point to an area of the site that was left for cooking; activity-based delineation of space is common in small scale societies (e.g., Kozarek 1997).

So, what does this mean regarding the utilization of Turpin during the Late Woodland period? Given the data produced from this project, along with dates from the FARM report (Cook 2014) and previous excavation by Riggs (1998) and the CMNH, a

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6 Test Unit excavations are included in Appendix C.
few tentative conclusions can be reached. First, the Late Woodland occupation of Turpin was relatively continuous over approximately 600 years (Figure 9.2). However, consideration of the consistency of Late Woodland dates suggests that while Turpin may have been occupied throughout the Late Woodland period, it this occupation may have been sporadic. This supports the idea that Late Woodland societies may have been relatively mobile foragers seasonally mapping onto repeat use sites (Clay and Creasman 1999). It is apparent that occupation spanned both the early and late Late Woodland periods. Lowe Cluster spear points and later Jack's Reef arrow points support this designation. Second, based on limited dating, the large stone burial mound appears to have been utilized primarily during the late Late Woodland period. This may point to shifting utilization of the site by what are thought to have been more mobile groups (Seeman and Dancey 2000).

Overall, we are still not much closer to understanding the physical aspect of the Late Woodland occupation at Turpin. I have tentatively suggested that deep areas of intensity in the magnetic survey located near the center of the landform may reflect the primary concentration of Late Woodland activities. This will take considerable effort to examine in the future, considering it is likely overlain by Fort Ancient midden and structures. However, understanding these areas at the central portion of the landform is a primary element of my future investigations of the site. I have also suggested that, based on admittedly limited lines of evidence, a glimpse into Late Woodland site structure may be evident. If the deep central areas of the landform do reflect areas of intense occupation (perhaps habitation, if more structural evidence is recovered) and the eastern area reflects an activity/cooking/trash disposal area, this may reflect the remains of a community with delineated habitation/activity space. However, when this community existed over the 600 years of the Late Woodland period, and what, if any, relationship its inhabitants had with the burial rituals associated with the stone mound is unclear at this point and requires future work.

Refining understanding of the Late Woodland at Turpin is important, even if it has raised more questions. I strongly suggest that assertions of a Late Woodland village and gradual development into Fort Ancient farmers at Turpin must be viewed critically. We know people occupied this landform on and off between AD 400 and AD 1000, but how
they lived, what processes created the dense middens beneath the late Fort Ancient mound, and what relationship these activities had to mortuary behavior associated with the stone burial mound remain important but unresolved questions.

**Fort Ancient Village Life at Turpin**

The majority of information generated from this study is relevant to the Fort Ancient occupation of the Turpin site. Perhaps appropriately, this reflects the relative occupational intensity of the site. Scholars have alternatively suggested that Turpin reflects one to two villages occupied early (Cowan 1987) or throughout (e.g., Drooker 1997; Griffin 1943) the Fort Ancient sequence. However, such findings were based on very little excavated evidence apart from a burial mound and incidentally encountered structures. Through use of museum records, surveys aimed at elucidating community structure, and excavation of prehistoric houses, the present study has helped clarify the nature and timing of the Fort Ancient occupation of this site. In doing so, this work has also helped clarify the nature of early Fort Ancient communities in the lower Miami Valleys.

By reexamining museum collections from Metz's 19th Century work, I determined that all of the diagnostic late Fort Ancient artifacts (Madisonville ceramics and a disk pipe) that supposedly came from Turpin were recovered from another site in the Little Miami Valley. This removes all diagnostically late markers from the site; the remaining diagnostic artifacts point to an early Fort Ancient occupation. This work also highlighted the number of previously recovered *Ramey-like* ceramics at this site. The sample of five sherds with these motifs is greater than some sites in the American Bottom (c.f. Emerson 1989). The frequency of these vessels and other non-local artifacts like chunkey stones point to Mississippian interaction.

Previous work by both Harvard and the Cincinnati Museum suffered from judgmental sampling. Knowledge of the site was derived from burial mound and random contexts. As such, systematic magnetic and bucket auger surveys designed to clarify the nature of prehistoric community structure at Turpin were conducted. These surveys identified two spatially and archaeologically distinct loci of activity. In each locus, circular communities of potential houses were evident, surrounded by high densities of
material culture. Excavation of one house in each context provided important evidence regarding chronology of occupation, artifact styles, and house construction techniques.

House 1, located in the western locus, reflects the remains of a Mississippian-style wall-trench house, initially constructed between AD 1040 and AD 1188. A period of renovation, marked by what is interpreted as the construction of a fresh clay floor and the expansion of the eastern wall, dates between AD 1180 and AD 1265. The material remains recovered from this house are distinctly different from both preceding Late Woodland and traditional Fort Ancient assemblages, and likely reflect trash deposition from the community. Shell-tempered pottery with plain/smoothed surfaces dominates the assemblage, which stands in contrast to other early and middle Fort Ancient sites (e.g., Cook 2008; Turnbow and Henderson 1992). Based on chronology, the ceramic assemblage, and supporting isotopic work (Cook and Price 2015), I suggest that House 1, if not the entire western community, reflects the settlement of non-local Mississippian migrants at Turpin. This event appears to be the inception of the "Fort Ancient" occupation of Turpin. The lifestyle that was transported includes many elements of the Mississippian bauplan, although social inequality is notably lacking.

House 2, located in the eastern locus, is both similar to and distinct from House 1. This wall trench house was occupied later; initial construction occurred between AD 1206 and AD 1270. The north wall was renovated at least twice, although the outer wall is statistically indistinct from the inner wall, which dates to AD 1219-1270. The material remains reflect what I have argued to be redeposited midden. Ceramics from this context are shell tempered with a broad array of designs and exhibit more cordmarking than other contexts excavated as part of this study. Intruding into the northernmost wall trench was a large pit, dated between AD 1223 and AD 1276. This pit is filled with ceramics, faunal remains, celts, and non-quotidian remains like bone flutes, deer-phalanx tinklers, and a stone discoidal. Ceramics from this context exhibit the highest frequency of decoration and are predominately shell tempered. This pit is interpreted as a distinct context, perhaps reflecting the material remains of a ritual or ceremony.

The relationship between these two communities is just beginning to be elucidated and will be the focus of future fieldwork. At this point, it appears as the initial occupation of the site occurred in the western community, early during the Fort Ancient
sequence. At some point around AD 1200, House 1 was renovated and House 2 was constructed. This may reflect a small-scale fissioning event, which were common in early villages (Bandy 2004), or a secondary influx of people into the site. The proliferation of decorated vessels evident in House 2 and Feature 100 may point to an active attempt by potters in the eastern community to differentiate themselves from those in the western community. It may seem strange that this daughter community would not search for a location further upriver. However, the continued spatial, social, and ritual ties to Turpin may be explained by the fact that the large-scale mortuary program in and around the earthen burial mound continued until the end of the occupation at Turpin (Cook 2014). The draw of this connection may have been enough to tether at least some elements of an expanding population to this landform.

Late Woodland - Fort Ancient Connections?

In an early discussion of cultural patterns at Turpin, Griffin (1952:187) suggested that "...at this particular site there is little or no indication of a gradual development from the Newtown Focus into the Turpin Component of the Fort Ancient culture.” Throughout this dissertation, I have at times relied on Griffin’s foundational work, and at times suggested his findings are in need of revision. Through all of this, I often come back to one question: how, given the limited data at his disposal, did he so often tend to be right? Griffin’s prescience in the above quote mirrors findings in the present study. Despite subsequent work that suggested specifically at Turpin (e.g., Riggs 1998; Tankersley and Haines 2010) and in general (e.g., Pollack et al. 2000) that the origins of Fort Ancient lie in local Late Woodland dynamics, Griffin again seems to be right. The initial thrust of Fort Ancient, at least in the lower Miami Valleys, seems to be related to an influx of Mississippian migrants.

Throughout the numerous research questions in this study, that the Late Woodland/Fort Ancient connection acted as a sort of null hypothesis reflects this long-held notion of autochthonous change. However, at this point there appears to be little to no relationship between these occupations apart from their use of the same landform. While Mississippian migrants may have initially been drawn to this location because of the Late Woodland stone burial mound and attempts to socially link their communities to
past ancestors, their origins appear to lie elsewhere. The preference of migrant communities to settle at Turpin may also be related to the similarity between this open floodplain habitat and the "Mississippian niche" (Smith 1978).

**The early Fort Ancient period in the Miami Valleys**

Early considerations of the Late Prehistoric period in Southwest Ohio highlighted differences between this region and the rest of the Fort Ancient culture area. Griffin's (1943) Madisonville Focus, for example, is notable for its Mississippian connections. Similarly, Cowan's (1987) Turpin Phase highlights characteristics such as shell tempered plain pottery, wall trench structures, and Mississippian artifacts. Limited subsequent fieldwork in this region and the predominance of gradual models of Fort Ancient development have relegated the insights of Griffin and Cowan in this particular region to regional particularities. Griffin (1993) himself had an eventual change of heart, reflecting dominant processual models popular at the time. The present study, along with the work of Cook and others (Comstock and Cook 2016; Cook and Price 2015; Cook and Aubry 2014) is bringing this region back to the forefront of understanding the genesis of Fort Ancient. This section serves as a reassessment of the early Fort Ancient period in the lower Miami Valleys, with particular attention paid Mississippian connections.

Turpin, Guard, and State Line are the three known habitation sites that date to the early Late Prehistoric period (c. AD 1000-1250) in the lower Miami Valleys. These sites are particularly important because they exhibit distinct Mississippian characteristics and have been shown to be locations at which non-local individuals were buried (Cook and Price 2015). The present study placed these sites within a broader understanding of the spread of Mississippian groups up the Ohio River, and in doing so highlighted their unique nature in a regional perspective.

Each of these well-dated communities was occupied between AD 1050 and AD 1275, contemporary with early Mississippian polities like Cahokia, Wickliffe, Kincaid, Angel, and Prather. As this study has highlighted, each of these early Fort Ancient communities also exhibits significant Mississippian connections in the form of household architecture, material culture, and direct migration. A brief overview of these
characteristics serves to demonstrate the unique nature of these sites when viewed from the perspective of the Middle Ohio Valley.

Wall trench architecture, a patently Mississippian house design (e.g., Alt and Pauketat 2011), is the dominant form of construction at early Fort Ancient sites in the lower Miami Valleys. As noted, salvage excavations at small portions of the State Line site produced evidence of at least three to five wall trench structures (Cook and Genheimer 2015), suggesting that these structures were common. The Guard site has produced evidence of at least four wall trench structures, although it is likely that the majority of houses here were constructed using this technique (Cook and Genheimer 2015). The Turpin site has produced numerous wall trench segments, although many were discovered by Metz (1885) and contextual information is lacking. Metz encountered at least 14 wall trench segments representing at least a minimum of seven structures distributed across much of the landform (see Chapter 6). The present study has encountered two additional wall trench structures, increasing the number of these houses to at least nine at the Turpin site.

Consideration of when these wall trench structures were constructed helps clarify their unique nature in a regional perspective (Figure 9.3). At sites where wall trench structures have been dated, each appears to have been constructed during the early Fort Ancient period. At this point, considering the number of early Fort Ancient houses that have been excavated in the region, it is clear that Mississippian-style wall trench architecture was the dominant technique for house construction during this period. Data at this point allow for a revision of Pauketat's (2007) map of the spread of wall trench architecture (Figure 9.4). Placing Fort Ancient wall trench structures in context helps highlight not their uniqueness, but now Fort Ancient fits well into the pattern of movement and the establishment of Mississippian enclaves throughout much of the Midcontinent and Southeast.

The artifacts recovered from these sites also point to Mississippian connections. Each of these sites has unique Mississippian artifacts as well as more quotidian indicators of non-local origin. State Line has produced numerous chunky stones, Ramey ceramics, and pottery trowels, to name a few. Guard has produced Ramey-like ceramics, chunky stones, and most notably a large Ramey knife made from non-local chert. Turpin has also
produced numerous chunkey stones, *Ramey* and *Powell Plain* ceramics, an anthropomorphic pipe (Drooker 1997:90), and a bone pin depicting a man holding a Ramey knife (Oehler 1973). While all of these can be errantly explained away as trade goods (e.g., Pollack and Henderson 2002), looking deeper at the ceramic assemblages from these sites provides more compelling data regarding Mississippian connections. In Chapter 8, I examined the prevalence of shell tempered plain ceramics throughout the region, arguing that these reflect, or are at least notably similar to, Mississippi Plain ceramics. The ceramic assemblage from each of the three sites noted here is composed primarily of these shell tempered plain pots, which are in line with the everyday Mississippian pottery type noted above.

Finally, geochemical analyses by Cook and Price (2015) provide direct evidence of Mississippian migrants. Non-local people were interred at State Line, Guard, and Turpin. Turpin stands out with the highest prevalence of non-local individuals; up to 30% of sampled burials produced results consistent with areas such as Cahokia, Angel, and the Middle Cumberland region of Tennessee. Biological evidence is thus well in line with archaeological evidence pointing to direct influence from Mississippian regions.

In summary, available evidence from early Fort Ancient settlements in the lower Miami Valleys suggests that these people were emigrant Mississippian farmers who grew maize, lived in circular communities of wall trench houses, and made ceramics tempered with shell. Subsequent changes in terms of classic Fort Ancient characteristics likely reflect complex processes of hybridization and ethnogenesis and will provide fruitful ground for future research. When compared to contemporary Fort Ancient settlements south of the Ohio River like Thompson, Dry Run, and Muir (see Chapter 8), early Fort Ancient settlements in the lower Miami Valleys appear as distinct outliers.

**New people, new villages, new ways of life**

The scenario put forward here is that early Fort Ancient culture reflects the emergence of completely new ways of life when considered from an isolated Middle Ohio Valley viewpoint. Much as Prufer and Shane (1970:258) suggested for the central Scioto Valley, it seems clear now for southwest Ohio that "...the differences between Fort Ancient as a whole (including the early phases) and the preceding Late Woodland
phases...appear to be radical indeed. Especially as far as the obvious differences in material culture are concerned, the sharp break between the two traditions seems obvious indeed. In an impressionist sense, it is as if Fort Ancient appears full-blown, without obvious antecedents, on the prehistoric scene of southern Ohio.” Although this is a strong stance, the main points that (i) the differences between the Late Woodland and Fort Ancient lifeways are dramatic and (ii) the emergence of Fort Ancient culture appears very abruptly, are particularly relevant to the present study.

This project, through examination of multiple scales starting with one key transitional site, has supported the argument that early Fort Ancient communities in the lower Miami Valleys reflect intrusive migrant villages. These migrants have clear links to Mississippian chiefdoms in the Midwest and Southeast. The ways of life that these villagers exhibited, including circular communities of wall trench houses, shell tempered pottery, and maize agriculture, are markedly different than preceding Late Woodland cultural patterns. Based on information from this study and others, a potential scenario integrating findings from multiple scales can be constructed.

In this scenario, the establishment of the western community and initial construction of the burial mound at Turpin occurred at some point between AD 1050 and AD 1175. This range corresponds both with the rise of Cahokian influence and the onset of early 12th Century droughts in the American Bottom, although it is difficult to specify at which point the founding of Turpin occurred. Overlaying the temporal extent of droughts on a Bayesian model of dates from House 1 (Figure 9.5), a case can be made for the founding of this initial community at a time corresponding with droughts in the American Bottom. If this holds true, these migrants may have left Mississippian centers as a result of drought and/or the emergence of institutionalized social inequality. In terms of their founding, sites like State Line and Turpin may reflect outposts like Aztalan, but lack antagonism with local populations. This may be a result of low local population densities in the lower Miami Valleys. With the decline of Cahokia and other centers, subsequent emigration events may have occurred (e.g., Benson et al. 2007; Benson et al. 2009). Communities such as State Line and Turpin would also have served as a known social connection for subsequent migrants (after Anthony 1990).
It is important to consider the composition of immigrant populations. Arguing against migration in the case of Fort Ancient, Griffin (1993:55-56) posited that "one might expect that in the early Turpin phase, roughly contemporary with the Stirling and Moorehead phases of the American Bottom, that if there were military men, trader entrepreneurs, or missionary groups bringing Cahokia Culture to the backward denizens of the Ohio valley that there would be some evidence of such important individuals in the burial program, or at least a significant presence of Cahokia-manufactured items in the material culture of the Turpin phase sites." Here we see the supposition that migration events were catalyzed by and only included specialized groups, like traders, warriors, or missionaries. It is important to note that the material expectations (non-local burials and Mississippian material culture) are common at Turpin Phase sites, as noted above.

What Griffin neglects is the possibility for movement by communities or subsets of communities like lineages. In the literature on Neolithic expansion, the movement of agricultural communities is a potent factor in the spread of farming (Bandy 2004; Bellwood 2004). In contemporary Mississippian studies, the movement of households or communities is seen as one of the ways in which the process of Mississippianization occurred (e.g., Blitz and Lorenz 2002). What this suggests is that in cases of Mississippian migration, scenarios that require the movement of elites or the founding of mound centers neglect common forms of movement and set up expectations of migration to fail. In order to more fully explore the movement of people in the Midcontinent, we must be open to a variety of forms of migration, particularly those most common among small-scale agricultural societies.

Regional Differences in Fort Ancient Research - Theory and Reality

A lingering question in the Late Prehistoric period of the Middle Ohio Valley is the level of similarity between Fort Ancient cultures throughout this region. What we consider as Fort Ancient is likely an amalgamation of many diverse people with unique histories and adaptations to their local environments (Cook n.d.). They are lumped archaeologically because of relative geographic proximity and a general similarity in subsistence and settlement patterns. It has often bothered me that different regions appear to have different theoretical approaches to interpreting regional patterns. As briefly
discussed in Chapter 4, fieldwork in Kentucky and central Ohio approach cultural change through the lens of gradual development, focusing on human adaptation and evolutionary success. The upper Miami Valleys have been approached using interactionist models (Cook 2008; Essenpreis 1978), suggesting that some Mississippian influence influenced cultural development. In the lower Miami Valleys, including the present study, change is seen as a result of an initial influx of people that catalyzed cultural change in the region.

These differences have led to disagreements and a general refusal to talk across boundaries. Examining regional patterns in this study has prompted me to ask the question: what if we are all correct for our given regions? In this case, instead of disparate regions acting along their own historical trajectories, the early and middle Fort Ancient periods may reflect a more generalized Neolithic pattern of initial settlement by non-local farming communities and a subsequent spread of people up tributary valleys. Socially and technologically, this process results in hybridization with local populations and a growth away from classically Mississippian traits.

In the Middle Ohio Valley, I suggest that the most intense occupation during the early Fort Ancient period occurred in the southwest portion of the study region, including the lower Miami Valleys. This has been suggested previously by Cowan (1987) and Griffin (1943). As discussed above, these communities demonstrate many Mississippian characteristics and I have argued that they are more similar to Mississippian communities than contemporaneous Fort Ancient communities. Contemporary communities south of the Ohio River appear to be qualitatively Woodland, meaning they have set-post structures, linear community organization, and have primarily rock tempered cordmarked ceramics. However, these sites do have some evidence of shell-tempered ceramics and Madison projectile points, suggesting that there was interaction between these places and Mississippian migrant communities like Turpin, Guard, State Line, and likely others.

During the later portion of the early Fort Ancient period and into the middle Fort Ancient period, Fort Ancient culture as is commonly defined appears to have solidified and spread. Sites like SunWatch (Cook 2008) and Anderson (Essenpreis 1982) in the upper Miami Valleys, and Fox Farm in Kentucky (Pollack and Henderson 2016) exhibit a hybridization between earlier Mississippian characteristics and Woodland characteristics. SunWatch in particular provides a compelling case for the movement of people into the
upper valleys. Based on earlier work, Cook (2008) noted the presence of an anomalous house at the site. This house, located in the northern portion of the site, included a wall trench structure and the majority of shell tempered vessels at the site and stood in contrast to other set-post structures with assemblages of rock-tempered vessels. Based on recent biological work, Cook (Cook and Price 2015; Cook and Aubry 2014) has suggested that this anomalous house reflects a migrant from communities in the lower Great Miami Valley like Guard. Similar processes may have resulted in the establishment of villages like Taylor, Anderson, and Fox Farm. I would not be surprised to learn that similar patterns occurred in the Scioto River Valley at sites like Feurt, Baum, and Blain village. Detailed archaeological and biological work is necessary in these regions to test such hypotheses.

What this potential trajectory of establishment, expansion, and hybridization suggests is that despite current theoretical divides, we may all be honing in on different stages of the Neolithization process in the Middle Ohio Valley. In the lower Miami River Valleys, we have identified early migrant communities with ties to downriver Mississippian settlements. In the upper Great Miami Valley, evidence from SunWatch supports a secondary movement up river valleys. In many ways, understanding these hybrid or primarily Woodland-ish communities warrants consideration of in situ change, as these communities appear to have developed out of preceding traditions and have assemblages with little evidence of Mississippian contact. The time difference in regions like Kentucky, in which Mississippian influence is seen as having occurred only after AD 1300/1400, may reflect the lag in the Neolithization process in some areas. This hypothesis is preliminary, but I suggest that in stepping back a scale and considering the Middle Ohio Valley in boarder spatial and temporal frameworks, a unified and complex process unfolded that would look very different in different regions.

**Testing Mississippian Migration in the Early Fort Ancient Period**

In Chapter 2, I discussed five criteria for migration outlined by Rouse (1958) and expanded on these expectations. I also suggested that a strong case could be made for migration in a region by identifying both cultural and biological elements of suspected intrusive populations. The data presented in this project will be used to test for the
presence of migration in this region using these criteria. Beyond Rouse’s basic scale of a site or small region, Anthony (1990) suggests that the type(s) of migration that occurred must be understood in order to identify processes acting behind migration. This is accomplished by exploring the push and pull factors acting on prehistoric people that catalyzed movement. Given the regional and environmental data outlined in Chapters 8 and 5, respectively, I will explore which type(s) of migration occurred in the region in question.

Rouse's (1958) first criterion for identifying migration archaeologically is to "identify the migrating people as an intrusive unit in the region it has penetrated." On the site level, data generated from Turpin, both in this study and others, presents a compelling case for migration. The early (c. AD 1030-1190) community identified at Turpin exhibits patterning that is at odds with previous Late Woodland occupation of this landform and the region. While earlier people lived relatively mobile lifestyles, built set-post houses, and made cordmarked ceramics tempered with crushed rock (Seeman and Dancey 2000), House 1 at Turpin exhibits a markedly different pattern. This structure (which is one of at least 6 in a small community) was constructed using wall trenches, a patently non-local technique (see Alt and Pauketat 2011), and the ceramic assemblage is dominated by plain, shell tempered ceramics, which fit well within the utilitarian Mississippian Plain type common in the Lower Ohio and Mississippi Valleys. There is no evidence at this site of a gradual incorporation of these traits into an otherwise Woodland lifestyle. Additionally, numerous Mississippian artifacts, including Ramey-like and Powell plain ceramics, discoidals, and anthropomorphic pipes, were recovered from Turpin. When added to Cook and Price's (2015) finding that at least 30% of burials sampled at Turpin were non-local individuals who were buried at Turpin, data strongly suggest that this site reflects the founding and subsequent evolution of an intrusive community. In this case, both cultural and biological evidence support the interpretation that Turpin represents an intrusive community.

Rouse's (1958) second criterion is that, given evidence of an intrusive community, one must be able to "trace this unit back to its homeland." While this is already covered above to some extent, available data overwhelmingly suggest that the non-local people who comprised this 'intrusive unit' originated from Mississippian
centers or outlying communities. It is unclear exactly which, although archaeological and biological evidence support Cahokia, Lower Ohio Valley centers such as Prather, Angel, Wickliffe, or Kincaid, or Tennessee centers such as Hiwassee Island or Averbuch. Cook and Price (2015) suggest that the Turpin populations match strontium signatures for Angel, the Middle Cumberland region of Tennessee, and Cahokia. Architectural evidence also lends support to a Mississippian origin. Numerous wall trench structures are evident in early Fort Ancient communities (Cook and Genheimer 2015), including the two identified at Turpin as part of this study, at least three from Guard, and at least another three from State Line. This form of constructing a house is considered a hallmark of Mississipians (Alt and Pauketat 2011; Griffin 1967) and the ubiquity of this style among early sites in this region points to Mississippian people building these houses. The lack of hybrid forms of household architecture like those seen elsewhere (e.g., Alt 2006) further supports this hypothesis.

Ceramic assemblages provide another line of supporting evidence. Most of the vessels (80-90%) from Guard, State Line, and Turpin appear to reflect Mississippi Plain (plain, shell tempered) utilitarian ware. When compared to Mississippian sites throughout the region based on ceramic and site-level attributes, early Fort Ancient sites in the Miami Valleys cluster tightly with Mississippian sites (see Chapter 8). Early sites in Kentucky like Thompson, Muir, and Dry Run, as well as later Fort Ancient sites like SunWatch, often cluster based on a predominance of rock temper and cordmarked surfaces. This variability highlights the exceptional nature of early Fort Ancient communities in the lower Miami Valleys, and adds another line of evidence linking these communities to their Mississippian neighbors.

Rouse's (1958) third criterion is that it must be "determine[d] that all occurrences of the unit are contemporaneous." In this sense, the question is whether or not Guard, Turpin, and State Line, the early Fort Ancient sites examined in this project, are contemporary, thus reflecting immigration into the region. As part of this study, I have presented dates from all three sites (Figure 8.2; Table 8.1). Each of the sites in question date between cal. AD 1025 and AD 1275, reflecting a primarily early Fort Ancient occupation. Consideration of wall trench structures that have been dated lends more
support to the contemporaneity of these sites, and the early timing of Mississippian presence in this region (Figure 9.3).

Rouse's (1958) fourth criterion suggests that one must "establish the existence of favorable conditions for migration." I interpret this as a requirement that push and/or pull factors (sensu Anthony 1990) must be identified justifying why people would have been motivated to move in the first place. The push and pull factors covered in Chapter 5 provide evidence of 'favorable conditions for migration.' First, environmental change associated with the Medieval Climate Anomaly was a driving factor during this period. During the AD 1100-1300 period, conditions deteriorated throughout much of the Middle Mississippi and Lower Ohio Valleys, resulting in long-term droughts. Benson et al. (2009) suggest that such droughts may have ultimately influenced the decline of Cahokia and the exodus of people from this center. During this time, most of the Middle Ohio Valley experienced moist conditions, likely more favorable for maize agriculture.

In addition to environmental push/pull factors, social conditions may have also played a role. I have noted that many early Mississippian chiefdoms in the Midcontinent rose to power in times of relatively stable conditions, but within a century had to deal with instability and drought. It is at this point in Cahokia (c. AD 1150-1200), for example, that construction projects shifted focus and palisades were constructed (Benson et al. 2009). It was also at this time that a number of outlying farming communities once tethered to Cahokia dispersed. These shifts may point to internal conflict and a tightening of control by elites, issues which may have caused some people to vote with their feet and leave in search of areas with less overt social inequality. In this sense, social pressures (albeit underlain by environmental transitions) may have acted as an additional push factor for Mississippian people.

The last of Rouse's (1958) criteria is that one must "demonstrate that some other hypothesis, such as independent invention or diffusion of traits, does not better fit the facts of the situation." This is a difficult criterion, and must ultimately appeal to Occam's razor. What I have suggested here is that an influx of Mississippian farming communities into the southwest portion of Middle Ohio Valley catalyzed the appearance of novel patterns and relationships, resulting in what we refer to as Fort Ancient culture. With them they brought a Mississippian Bauplan (or package), including sedentary village life,
wall trench houses, shell tempering, maize agriculture, and a number of other traits. Two alternatives exist that are easily dispelled. The first is that of gradual and selective adoption of Mississippian traits over time, a scenario posited by many scholars in the region (e.g., Church and Nass 2002; Pollack et al. 2000). Evidence at this point suggests that these traits were adopted wholesale and abruptly during the early Fort Ancient period (c. AD 1000-1250), at least in the southwestern portion of the region. The second alternative is that each of these traits was independently invented both in the Mississippi Valley and in the Middle Ohio Valley. No scholar suggests this scenario, as it strains reason to believe that so many similar but independent innovations could occur in the same timeframe. With these alternatives out of the way, the hypothesis best supported by current evidence is that migration of Mississippian farming communities occurred.

Application of Rouse’s criteria for assessing the presence of migration in a region provides a successful framework for exploring site-level and regional data. As suggested in Chapter 2, a strong case for identifying migration in small-scale societies involves identifying sudden changes in archaeological and cultural characteristics, as well as biological markers of non-local people. In the case of early Fort Ancient societies, this study has identified non-local artifacts (both utilitarian and ceremonial), novel lifeways (maize agriculture, wall trench houses, circular villages), and non-local individuals have been identified by Cook and Price (2015). In the case of small-scale prehistoric societies, I would argue that this is the strongest case one could ask for in terms of migration. All lines of evidence point to an influx of people from Mississippian regions who settled in locations similar to their home regions.

Assessing Forms of Migration

Now that the case for migration in the early Late Prehistoric period of the Middle Ohio Valley has been supported, the form or forms that this movement took can be explored. In Chapter 2, I discussed that there are numerous models for understanding how migration occurred (Anthony 1990; Zvelebil 2001). These include wave-of-advance, migration stream, and leapfrog models, each of which has material correlates. Each model also has implications for the lifestyles of migrants and local populations. Using the data generated from this study, as well as knowledge of Mississippian settlement systems
throughout the Ohio Valley, these models can be used to inform on the processes underling Mississippian movement. The data from this region likely meet the expectations of one or more of these models, but particular historical processes may add unique wrinkles.

Including Fort Ancient sites in the lower Miami Valleys discussed in this project, the distribution of Mississippian settlements in the Ohio Valley between AD 1100 and AD 1300 exhibits a telling pattern (Figure 9.6). Large chiefdom centers were established on the broad floodplains of the Ohio River, typically near confluences with large tributaries. Wickliffe Mounds, a large Mississippian center dated between AD 1100 and AD 1350, was founded near the confluence of the Mississippi and Ohio Rivers (Wesler 2001). Approximately 90km up the Ohio River, near its confluence with the Tennessee and Cumberland Rivers, the larger contemporary center of Kincaid is located (Muller 1986). Kincaid has at least nine earthen mounds, and is recognized as one of the largest Mississippian polities (Muller 1986). Although dating is unclear, most scholars tend to agree that Kincaid was occupied at some point between AD 1000/1100 and AD 1300/1400 (Butler 2000). Upstream approximately 210km is the Angel site, located near the confluence of the Ohio and Green Rivers. Also occupied between approximately AD 1050/1100 and 1300/1400 (Monaghan and Peebles 2010), this site contains 5 mounds (Black 1967) and is typically considered the furthest northeast extent of Mississippian expansion.

Beyond these three large Mississippian centers, two additional sites are of importance in tracing the pattern of expansion up the Ohio River. The Prather site is located approximately 280km northeast of Angel. Prather differs from the other centers discussed here in that it is located away from the Ohio River by about 5km and is not in a confluence area. It is, however, located just east of the Falls of the Ohio, a portage spot on the Ohio River. Although not as well known or thoroughly studied as Angel or Kincaid, Prather was a Mississippian polity with four mounds that was likely inhabited between approximately AD 1100 and AD 1300 (Munson and McCullough 2004). It also exhibits a residential core and may have been surrounded by a palisade much like Angel. Prather's smaller size (~5ha) and upland setting suggest that this settlement was
qualitatively different than those of Angel and Kincaid, yet still reflects a Mississippian community of regional importance.

Approximately 160km to the northeast of Prather, we encounter early Fort Ancient settlements. Particularly relevant to this discussion is the State Line site (Vickery et al. 2000), discussed in Chapter 8. Much like Prather, State Line is set back approximately 4.5km from the Ohio River. It is located on a terrace of the Great Miami River. In addition to their environmental settings, State Line and Prather appear to be very similar. State Line is also a relatively small (4-6ha) center with six mounds and evidence of multiple or sequential residential centers (Cook 2017). It also has significant evidence of Mississippian people and material culture (Cook and Price 2015; Vickery et al. 2000). In this sense, State Line may fall into the same category as Prather; they are qualitatively different than polities like Angel and Kincaid, but still reflect Mississippian centers in many ways. This is not a commonly held interpretation of State Line (or early Fort Ancient, for that matter) (see Pollack et al. 2002), but considered broadly, it fits well within the pattern of Mississippian expansion.

The pattern suggested here is that of a sequence of primary centers founded early during the Late Prehistoric period, located every 100 to 300 kilometers along the Ohio River. This fits well with the "leapfrog" model for migration (Anthony 1990; Zvelebil 2000), which is defined as "selective colonization of an area by small groups, who target optimal areas for exploitation, thus forming an enclave settlement among native inhabitants" (Zvelebil 2000:2). In the case of the Ohio River Valley, this definition requires further discussion in regard to the ecological areas that migrants focused on. Smith (1978) defined a Mississippian niche for maize agriculture, which involves open floodplains, oxbow lakes, and fertile soil. If we consider the environmental context of sites like Kincaid, Wickliffe, Angel, Prather, and State Line, it becomes evident that each of these sites (with the possible exception of Prather) appears to have mapped onto these niche areas. Additionally, there is a distance-decay aspect to this leapfrog pattern. As one moves further from the confluence area of the Mississippi and Ohio Rivers, these centers become smaller and less classically Mississippian.

Second, Zvelebil’s (2000) definition of the leapfrog model includes a consideration of the relationship between migrants and local populations. He suggests
that new populations often form enclaves, which are locations that are internally culturally similar, but are distinctly different from surrounding populations. The potential forms of interaction between local and non-local groups are considered in terms of replacement, integration, and survival (Zvelebil 2000: Table 7.2). This is assuming that indigenous population density is sufficiently high to foster relationships between them and immigrants. Although this was the most likely the case in some situations (e.g., Goldstein and Richards 2000), at this point there is little evidence for contemporaneous communities in places like the Miami Valleys. In the case of the spread of Mississippian people and culture, the development of each enclave appears to have resulted in a system of outlying settlements. It is unclear in many situations whether these were non-local migrant communities or whether the founding of enclaves catalyzed change in local populations. For example, Green and Munson (1978) identify a hierarchy of settlements around Angel, including villages, hamlets, and farmsteads. In the case of the Miami Valleys, it is conceivable that contemporary sites like Guard and Haag were related to the development of and events that occurred at State Line. Similarly, contemporary sites like Sand Ridge (Riggs 1998), Clough Creek, and potentially even the later Hahn site (Cook and Genheimer 2015), may be related to the establishment of the Mississippian community and mortuary center at Turpin.

Considering a second stage of expansion, this process would explain the appearance of Middle Fort Ancient (c. AD 1250-1450) settlements like SunWatch (Cook 2008) in the upper Miami Valleys, while the lower valleys were largely abandoned. SunWatch (2008), the archetypical Middle Fort Ancient village, demonstrates hybridization of ceramic production (primarily rock temper) and household architecture (primarily set-post), suggesting a population of primarily Woodland-like people. Cook (2017) suggests that an individual or lineage from the lower Great Miami Valley may have played a role in establishing this hybrid community.

The scenario presented here is one of migration of agricultural communities along river valleys, which is well in line with the Neolithic transition exhibited elsewhere in the world (e.g., Bellwood 2004). Mississippian communities moved up the Ohio River during the period between AD1050 and AD 1300, establishing communities in locations that resemble the large floodplains of the American Bottom. This can productively be...
traced using well-dated wall trench architecture (e.g., Pauketat 2007) as well as the appearance of Mississippi Plain ceramics at well-dated sites (this study). A secondary stage in this transition may point to the origin of many Late Prehistoric cultural taxa, including Fort Ancient. Specifically, after the initial establishment of Mississippian enclaves, particularly at the confluence of the Ohio River with smaller tributaries, cultural hybridity and ethnogenesis appear to have taken place, resulting in the emergence of novel cultural systems.

**Macro- and Micro-evolution in Context**

Throughout this project I have stressed the importance of macroevolutionary theory in understanding large-scale cultural change. In some ways, I have been purposefully dogmatic in my approach in order to work against prevailing models of gradual cultural change in the Ohio Valley. In doing so, I have stressed the importance of punctuated cultural transitions stemming from climate change, in this case resulting in the migration of farming communities. Based on the evidence presented here and elsewhere, I believe that this is a legitimate interpretation of the emergence of maize-based village life in the Middle Ohio Valley. However, microevolutionary forces were likely also important in the decision-making that led people to leave the Central Mississippi and Lower Ohio River Valleys, and equally as likely for the establishment, adaptation, and perpetuation of migrant communities in the lower Miami Valleys. Although many scholars stress the importance of either macroevolution or microevolution to the exception of the other, the relationship between these types of change is important to consider. As I have stressed throughout this dissertation, complex processes such as cultural change occur at multiple scales as a result of interrelated factors. As such, there is a productive middle ground between exploring micro- and macro-level change that takes into account both scales.

It is productive to briefly return to biological considerations of evolution to consider the relationship between punctuated equilibrium (*sensu* Gould 2002) and more gradual forms of evolution. It is often suggested that these two traditionally competing perspectives are mutually exclusive, but this does not have to be the case. Indeed, the logic of punctuated equilibrium suggests that after punctuated events, species remain
relatively static over time. However, in many situations it appears as though there is also gradual change in species throughout these periods of relative stasis. Meaning, microevolutionary forces (i.e. natural selection, genetic drift, etc.) take place and result in gradual change of species over time. In this sense, punctuated events occur that transform the physiographic and biological landscapes, but after these events gradual change continues to occur on the level of generations, although set against the backdrop of novel contexts.

I would argue that the same general processes can occur in cultural evolution. By this I mean that gradual changes linked to a range of factors (from natural selection to agency) occur in cultural systems as the norm, but punctuated events change the rules of the game. Put another way, natural or historic events change the contexts within which individuals, households, communities, and entire cultural systems exist. However, following these events, microevolutionary forces continue to act gradually on each of these scales, eliciting small-scale changes. The following paragraphs represent guidelines to begin examining these interacting multiscalar processes in the study region used in this dissertation.

Future work stemming from this project and collaboration with other scholars working in the region will begin to focus on microevolutionary factors and link them to the broader changes identified as part of the present study. What I have identified on a macro-scale is a link between increased droughts and the movement of agricultural communities. However, this begs a series of important questions. First, what factors played out at the scale of individuals, households, and communities in the American Bottom and the surrounding region that fostered the ultimate desire to move? Climatic and economic instability often underlie more overt forms of oppression, including violence, starvation, and the deepening of social inequality. Detailed examination of archaeological contexts at sites like Cahokia that were occupied during the transition from moisture availability to drought could help shed light on this critical time period. At Cahokia, the transition from mound building to palisades has already been noted between the Stirling and Moorehead phases (e.g., Benson et al. 2009). Expanding this research to parse the indicators of instability, including interpersonal violence and dietary stress, at the levels of households and communities within the large polities could help reveal the
multifaceted reasons for migration on small scales. Such evidence would help build an understanding of microevolutionary factors of change.

The second question raised is how did groups of people adapt to new environmental conditions once they have moved? Along with others (e.g., Cook et al. 2015), I have identified evidence of immigrant communities in the Middle Ohio Valley during the early Fort Ancient period (c. AD 1000-1300), suggesting that these were actually Mississippian agricultural communities. The changes that occurred associated with the emergence of what archaeologists call Fort Ancient culture likely reflect microevolutionary and stochastic change of Mississippians in new environments. Examining two types of Fort Ancient sites can help shed light on these processes.

The first types are those in the Miami River Valleys upriver from the initial settlements noted in this project. Sites like Schomaker and Campbell Island in the Great Miami Valley, Taylor and Anderson in the Little Miami Valley, and Horseshoe Johnson in the uplands between these valleys could help shed light on the processes of village fission and expansion, but also the continued adaptation of village communities to new environments. Such cultural adaptation likely underlies the emergence of distinctly Fort Ancient villages at places like SunWatch (Cook 2008). The second type of Fort Ancient site is those communities in adjacent regions to the Miami Valleys. Particularly, informative comparisons could be made in regard to Scioto Valley Fort Ancient communities such as Baum and Blain. Each of these communities has produced ceramic assemblages in line with those in southwest Ohio and may reflect a fissioning event from the Little Miami Valley into the Paint Creek, which is a tributary of the Scioto River. Additionally, comparing the trajectories of sites in the Miami Valleys with those of northern Kentucky sites could provide useful information regarding cultural contact or hybridization with local populations. An informative dichotomy may exist between Kentucky sites on the main truck of the Ohio River and those located the dissected uplands of Kentucky.

Each of these comparisons first relies on the macroevolutionary processes of cultural changes highlighted by the findings of the present study. Specifically, the migration of Mississippian communities into the region, a large-scale and punctuated shift, catalyzed change. However, after this initial event, microevolutionary forces were
likely the main mechanism of change. This is why in Chapter 4 I briefly noted that the competing models for Fort Ancient cultural evolution may in fact be less competing and more regionally-specific. Put another way, migration makes the most sense at the confluences of large rivers, but fissioning events, cultural contact, and hybridization make more sense in the surrounding areas. In this sense, the Fort Ancient culture area reflects a mixed set of evolutionary processes, ranging from macro to micro scales. This fact makes this region a compelling area to study the relationship between macroevolution and microevolution in cultural change.
Figure 9.1: Shell vs. Rock tempered ceramics in the Turpin bucket auger survey.
Figure 9.2: Late Woodland periods dates from contexts at Turpin.
Figure 9.3: Calibrated Fort Ancient wall trench dates between AD 1000 and AD 1300.
Figure 9.4: Proposed spread of the wall trench house style in the Mississippian region (adapted from Pauketat 2007).

Figure 9.5: House 1 Bayesian sequence with American Bottom drought ranges.
Figure 9.6: Mississippian centers by estimated site size between AD 1000 and AD 1300 in the Central Mississippi and Ohio Valleys.
Chapter 10: Conclusions: Macroevolution, Multi-scalar Analysis and Migration Revisited

This project has approached the research of prehistoric village origins in southwest Ohio and southeast Indiana through the lens of macroevolutionary theory. I have suggested that this historical process was the result of factors acting on multiple scales, including the onset of the Medieval Climate Anomaly, the movement of agricultural communities, and cultural contact and ethnogenesis at the community level. Punctuated change runs contrary to typical models of gradual change in this region but accounts for multiple lines of evidence and helps clarify the emergence of village life at local and regional scales. Perhaps the most beneficial aspect of this approach is the requirement to consider change not only at local or abstractly large scales, but at multiple scales ranging from households and communities, to small regions, to ethnoscakes, to broader environmental parameters. This approach avoids both myopic examinations of single sites and examinations at scales so large that findings likely do not reflect meaningful cultural patterns. Using a multiscalar framework for examining cultural change, this project has provided evidence that early Fort Ancient communities in southwest Ohio developed primarily as a result of an influx of Mississippian migrants. Among the reasons that people left the central Mississippi, Cumberland, and Lower Ohio River Valleys were severe droughts that likely destabilized communities in and around the American Bottom.

At the local scale, this project focused on thoroughly understanding prehistoric occupation of the Turpin site, a Late Woodland and early Fort Ancient site in the lower Little Miami River Valley occupied between AD 400 and AD 1300. Critical research on legacy collections, systematic archaeological and geophysical surveys, and excavations of domestic contexts allowed for a deeper understanding of this site that is commonly, and we now know mistakenly, referred to as a transitional site. Through this approach,
two Mississippian style wall trench structures were identified and excavated using test trenches. House 1 was constructed between AD 1040 and AD 1188 and was renovated between AD 1181 and AD 1265, and was filled with ceramics that defy local comparisons. They most closely match Mississippian wares from the Lower Ohio and Central Mississippi Valleys. House 2 dated between AD 1206 and AD 1270 and was filled with more traditionally Fort Ancient ceramics, including shell tempered cordmarked vessels with high rates of decoration. These houses are the earliest dated wall trench structures and fit well with geochemical work indicating that Turpin was a migrant community (Cook and Price 2015).

The scale of analysis was then increased to compare contemporary Fort Ancient settlements in the Middle Ohio Valley. By comparing Turpin with State Line and Guard, both located in the lower Great Miami Valley, and then expanding the comparison to sites like Thompson, Muir, and Dry Run, located south of the Ohio River in Kentucky, two early Fort Ancient systems were identified. The first, as was first noted by Griffin (1943) and then Cowan (1987), is a Mississippian-like manifestation located in the southwestern portion of the Fort Ancient area. These settlements were large, circular villages comprised of wall trench structures. They were arranged around plazas that had associated burial mounds. Ceramic assemblages are primarily shell tempered plainware with a high proportion of bowls. The second system reflects a more Woodland-like manifestation south of the Ohio River. These sites, although less well-studied, appear to have been composed of set-post structures, arranged linearly, and lack burial mounds. Ceramic assemblages are dominated by rock tempered cordmarked ceramics with a small number of shell tempered vessels. The appearance of two systems likely reflects an immigration of Mississippian groups who settled at the confluence of the Ohio with its tributaries in southwest Ohio and southeast Indiana, areas which mirrored the Mississippian floodplain niche identified by Smith (1978). The more local signature likely reflects local populations exhibiting some contact with settlements on the main trunk of the Ohio River. This system is quite similar to the ideas proposed by Essenpreis (1978), although this line of thought fell out of favor until recently.

In order to examine these findings at a broader scale, a sample of four contemporary Mississippian sites were added to the comparison. By examining the six
Fort Ancient sites noted above in association with Annis, Angel, Prather, and Hiwassee Island, the relationship between Fort Ancient and Mississippian was examined in greater detail. Findings suggest that early Fort Ancient communities in the Lower Miami Valleys like Guard, State Line, and Turpin, were more like contemporaneous Mississippian settlements than other early Fort Ancient communities in Kentucky. These Mississippian sites share similarities in site grammar, household construction, and ceramic production. Early Fort Ancient sites south of the Ohio River stand out as distinct outliers in each of these criteria. These findings provide direct archaeological evidence in support of recent biological work suggesting that many people buried at sites in this region were non-local in origin (Cook and Price 2015; Cook and Aubry 2014).

Finally, by examining the environmental contexts within which the cultural patterns identified here unfolded, I was able to examine some of the potential push and pull factors contributing to population movement in the Midcontinent. By creating and examining past moisture availability over space and time, I built on the work of Benson and colleagues (2007; 2009), who suggested that the central Mississippi Valley experienced droughts during the AD 1100-1250 time period. I expanded the spatial scope of their analysis to focus on the relationship between the central Mississippi and Lower Ohio Valleys and the Middle Ohio Valley. My findings suggest that while these droughts occurred in the American Bottom region, most of the Middle Ohio Valley experienced conditions comparable to or wetter than current averages. Periods of marked drought likely created a distinct 'push' for populations in Mississippian polities like Cahokia, Kincaid, and Angel, while the relatively wet conditions in Indiana and Ohio may have acted like a 'pull' factor. In essence, the disparity in environmental conditions between these two areas is a compelling explanation for why we see the emergence of Fort Ancient villages with distinct Mississippian characteristics around and after AD 1100 in the Middle Ohio Valley.

This project examined the study of village origins through the lens of macroevolutionary theory, a framework which stresses the importance of multiscalar analysis, human agency, and punctuated change. This approach led me to eschew adherence to standard gradual models of cultural change and develop multiple working hypotheses, including those that entertain rapid changes in cultural systems. The scales of
analysis outlined above also stem from macroevolution's understanding that cultural change is a result of processes working at and across multiple scales. This approach allows for a more inclusive, holistic understanding of cultural change and nests findings within broader considerations of human adaptation and cultural development.

Examining cultural change in the Middle Ohio Valley using a macroevolutionary framework resulted in the identification of migration as a punctuated event that catalyzed change in this region. This historical process was enacted at the household and community scales, but was initiated as a result of rapid environmental change. The community established at Turpin is one manifestation of a pattern identified here as acting both at local and regional scales. The success of this study suggests that a macroevolutionary approach may be fruitful when considering both the emergence, spread, and subsequent decline of early Mississippian polities between roughly AD 1000 and 1400.

Future Work

This project has set the stage for future examinations into the prehistory of the Middle Ohio Valley and the spread of Mississippian communities throughout much of the Midwest and Southeast. First, examinations at Turpin will assess whether or not the patterns identified at House 1 and House 2 reflect the communities of which they are a part. Excavation of additional structures in each community, in addition to probable pit features, will help to test these interpretations. Additionally, further examination of structures in the western community will hopefully help clarify the complex occupational history exhibited by House 1. Continued excavations at this site will help clarify the nature of Mississippian migration and early Fort Ancient village development.

Second, the basic but telling regional trends noted in Chapter 8 provide a foundation for studying the transmission of ideas, designs, and technological innovations along the river valleys of the Midcontinent. This is not only relevant to the early Fort Ancient period as identified here, but also throughout the middle and late Fort Ancient as well. I have begun building comparative site and ceramic assemblage databases for later sites with the intent of creating diachronic comparisons. Examinations at this scale could
help identify and better understanding ethnogenesis and cultural hybridization over time in the Miami Valleys.

Third, examining the emergence of village life in the early Fort Ancient period begs the question of what late Late Woodland settlements were like. Examining the link (if any) between Late Woodland and Fort Ancient at Turpin was one of the initial goals of this project. In fact, clarifying the nature of Late Woodland dynamics in southern Ohio was a driving factor in attending graduate school; this poorly understood time period fascinates me. Although I have demonstrated that there was no significant link between these cultural groups at Turpin, we are left with little understanding of how people lived in the Late Woodland period in southwest Ohio. Further investigations at known sites like Turpin and Sand Ridge, as well as large-scale survey and reconnaissance of river valleys, would help to flesh out the nature of Late Woodland settlement in the region.
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Watkins, Trevor

Wesler, Kit W.

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Williams, Stephen

Winterhalder, Bruce

Wissler, Clark
Wurster, Christopher M., and William P. Patterson

Wymer, Dee Anne

Yaeger, Jason and Marcell A. Canuto

Zeder, Melinda

Zvelebil, Marek
Appendix A: Auger Results
Ceramics

Since ceramics are often broken and accumulate in secondary refuse deposits, tracing the spatial distribution of ceramic sherds can help outline the structure of such deposits. Considering ceramics constitute a large proportion of artifacts recovered from this survey (49.79% by weight), their distribution largely mirrors of the entire assemblage (Figure A.1). Specifically, ceramics are most commonly located around the two loci in the central and eastern portions of the terrace. In Locus 1, ceramics are found throughout the center of multiple magnetic signatures which likely represent structures. In Locus 2, ceramics are found in a ring around a vacant central area, which may reflect a plaza. An additional area containing ceramics is located west of Locus 1, along a topographic high area on the terrace. This may represent one or more refuse pits or potentially another less dense locus of activity. Similar small areas with high amounts of ceramics are located on the northeastern and southwestern edges of the study area and likely represent secondary trash deposits such as pits based on their isolation as well as an overall homogeneity of artifacts.

The material used to temper ceramics is also an important consideration, since temper has been shown to reflect temporal changes in the Little Miami Valley (Riggs 1998). Riggs (1998) found that although there is overlap, the general temporal progression of temper type is from limestone to grit to shell. As such, the distribution of ceramics by temper type proves useful. Shell-tempered ceramics, which are considered a Fort Ancient characteristic (e.g., Cook and Fargher 2008), are most commonly found in the central portion of Locus 1 and in an arc on the western edge of Locus 2 (Figure A.2). Notably, both probable pits on the terrace edge contain large amounts of shell-tempered pottery, suggesting they are Fort Ancient in origin. An important void to note is the area around the Fort Ancient burial mound; very few shell-tempered ceramics were recovered from this area. Grit-tempered ceramics were recovered from many of the same areas as shell-tempered ceramics, including Locus 1 in the central part of the terrace (Figure A.3). However, there are a few notable exceptions. In Locus 2, on the eastern part of the terrace, grit-tempered sherds are distributed in an arc complementary to the shell-tempered sherds noted above. Together, these two ceramic types form a circular pattern
with a largely vacant center. Also, unlike shell-tempered sherds, grit-tempered sherds are present in small to moderate amounts in the area around the Fort Ancient burial mound. Limestone-tempered ceramics are often considered representative of a Late Woodland, or Newtown occupation (Riggs 1998; Seeman and Dancey 2000) and were found in small quantities (Figure A.4). Limestone-tempered sherds were generally recovered in those areas where neither shell nor grit-tempered sherds were densely distributed, suggesting differences exist between these two categories. However, limestone tempering is present in a small amount (4.15% by weight) of ceramics, and thus patterns in this artifact type may not constitute significant trends.

Historic plowing had an obvious effect on the distribution of ceramics on the terrace on which Turpin is located. The topographically high ridge on the western half of the terrace produced a fairly even distribution of ceramics, which decreases with landform elevation (Figure A.5). This is consistent with expectations, considering this area was plowed for much of the historic period. Two notable trends emerge from the plow-altered data. First, Locus 1 and Locus 2 are identifiable, although the structure of each is notably more dispersed at this level. Second, a number of high-density areas are evident along the western prominence of the landform, which may represent features that were clipped by plowing.

Below the plowzone (deeper than 30cm), the distribution of ceramics is clearer (Figure A.6). Findings support trends noted above. First, the structure of Locus 2 emerges as a clear arc around an otherwise vacant central space. The size of Locus 1 decreases to a few dense locales when only sub-plowzone distributions are viewed. This may suggest that the large distribution evident when plowzone assemblages were included is a result of plowing. Alternatively, it could point to an occupation that was closer to the surface (i.e. more recent), and was subsequently disturbed by plowing. Additionally, three artifact concentrations with limited spatial extent (i.e. potential pit features) are clearer in sub-plowzone contexts. The first is located approximately 60m west of Locus 1 and appears to be three augers with high densities of ceramics, especially in the center. The second and third concentrations appear on the northeast and southwest
edges of the landform and likely represent refuse pits given their distance from other activity areas and spatially confined nature.

Shell-tempered ceramics dominate the plowzone (compare Figures A.7, A.8 and A.9), and their distribution mirrors the assemblage-level patterns described above. Below the plowzone, (Figure A.10) shell-tempered ceramics are largely constrained to two dense concentrations in Locus 1, two potential pit features on the terrace edges noted above, and on the western half of Locus 2. Grit-tempered ceramics below the plowzone are also confined to a few key locations (Figure A.11). First, they are found in moderate densities in the central portion of Locus 1 and in two spatially confined spots to the west. Second, grit-tempered ceramics are located in a dense arc along the eastern edge of Locus 2. This distribution produces a mirror of that seen in shell-tempered pottery, which was in an arc on the western edge of this locus. Although preliminary, findings may point to a difference in ceramic production at Locus 2. Limestone-tempered ceramics were rare in this survey (Figure A.12). The small amounts that were recovered tended to be in locations where ceramics tempered with other materials were not found. This may lend some support to the idea that these sherds reflect a different occupation (early Late Woodland) than many other aspects of this survey. Most sherds were recovered from subplow zone contexts. Many of the limestone-tempered sherds were recovered from what is now a depression with a high water-table in some places on the southern edge of landform near the road. Other dense concentrations include an area which produced numerous sherds of multiple temper types along a topographically high area near the southwestern end of the landform. To note, neither locus produced high amounts of limestone-tempered ceramics.

**Lithics**

Lithic debris is an important indicator of tool production and resharpening. Habitation areas among sedentary groups were likely kept clear of sharp debitage (e.g., Kozarek 1997), meaning that it is more likely to reflect refuse deposits than actual areas of occupation. Total weight of lithic debris from bucket augers suggests that stone artifacts were generally ubiquitous throughout the terrace except toward the edges of the
landform (Figure A.13). However, meaningful clusters are evident. A high density ofdebitage was recovered from the center of Locus 1, on the interior of what appears to be a ring of structures. A different pattern is evident in Locus 2, where a ring-shaped distribution of flakes encircles a central space with very few artifacts. In both loci a few dense concentrations of lithics are evident. These may represent purposeful disposal of flake debris, some of which was likely scattered by historic plowing. An additional pattern to note is the paucity of lithic debris both between the two loci and in the Fort Ancient burial mound area. This suggests that stone tool production, which occurred at the two loci, was generally not conducted near the burial mounds.

Lithic debris in the plowzone was roughly distributed with both Locus 1 and Locus 2, although small amounts of flake debris were scattered throughout most of the landform (Figure A.14). Another isolated concentration was located west of Locus 1, along the terrace crest. One notable exception is the void where the Fort Ancient burial mound was excavated by Oehler (1973). Sub-plowzone lithic materials were significantly more isolated to the two loci noted above (Figure A.15), which is to be expected from undisturbed deposits. In Locus 1, lithic material was primarily located inside the ring of magnetic anomalies which may reflect prehistoric structures. One dense auger was located directly outside of this ring. In Locus 2, lithic material was recovered from the area outside the potential ring of structures, as well as in one dense isolated location on the eastern terrace edge.

**Bone**

The spatial distribution of faunal remains likely points to secondary refuse deposits (i.e. middens or trash pits) since decomposing remains are typically disposed of away from living areas. Much like lithic debitage, concentrations of faunal remains should thus reflect intentional disposal. Although species identification in auger assemblages is difficult because of the fragmentary nature of the remains, most if not all of the diagnostic remains appear to be those of deer, small mammals, and turkeys; no identifiable human remains were recovered from augers.
In the eastern portion of the site (Locus 2), bone is distributed in a constrained area in the shape of an arc or a circle around a central vacant space (Figure A.16). This is similar in nature to both ceramics and lithics. The central portion of the terrace produced significant amounts of bone, especially around Locus 1, but also extending north toward where a prehistoric structure was identified by Oehler (1973). The distribution of bone also extends south of Locus 1, into a topographically low area west of the Fort Ancient burial mound, which may represent intentional trash disposal in a swale.

It is informative to distinguish between unburned bone and burned bone. The distribution of unburned bone is largely redundant with that of the total amount of bone recovered, since it constitutes the majority (76.8%) of the faunal assemblage. The distribution of burned bone also highlights the density and shape of both Locus 1 and Locus 2, although it appears to be located in more spatially constrained areas (Figure A.17). This suggests that while burned bone was disposed of in and around where people lived, it may have been done so in more segregated locations when compared to unburned bone, a pattern which may reflect differences in disposal of cooking and processing debris, respectively. Additionally, the two potential pit features noted above for their high density of shell-tempered ceramics also contain large amounts of burned bone, strengthening the interpretation that these locations served as secondary refuse deposits on the terrace edges.

Both total bone and burned bone in the plowzone map onto the geophysical patterns referred to here as Locus 1 and Locus 2 (Figures A.18 and A.19). Bone recovered from plowzone contexts mirror these patterns but is distributed beyond them, especially running west along the rise in the landform. This is likely a result of historic plowing. Sub-plowzone bone maps more closely onto the geophysical loci (Figure A.20). Like many other artifact types, the interior of Locus 1 contains dense concentrations of bone, and the exterior of Locus 2 is ringed by bone remains. Notably, the area near the historic Turpin farmstead (identified as a potential habitation area by Oehler [1973]) also produced dense concentrations of bone. Additionally, the area immediately south of Locus 1 (in a topographically low area) produced numerous bone fragments; this may reflect secondary deposition from activities in Locus 1. Burned bone below the plowzone
followed the same pattern with two additions, each of which appears to represent an isolated pit feature (Figure A.21). The first is off the edge of the northeast edge of the terrace and was interpreted in the field as a Fort Ancient pit, based on its isolation, depth of deposits, and high concentrations of shell-tempered ceramics. The second is west of Locus 1, along the ridge of the terrace, and appears to have been a pit filled with burned bone and both grit and shell-tempered ceramics.

**Daub/Burned Clay**

Burned clay or daub was recovered during this survey, although it was difficult to verify as a result of the small size of samples. However, these pieces strongly resemble daub recovered from the nearby Guard site (12D29) (Cook et al. 2015), and are considered to be the remains of burned daub from prehistoric architecture. Daub was examined using a geometric interpolation algorithm, since there is a large discrepancy between some augers with small amounts of daub (e.g., 0.1g) and some augers with a large amount of daub (e.g., 24g). The spatial distribution of daub can provide information on the location of structures.

This survey has demonstrated that daub is concentrated in a few key locations (Figure A.22). Locus 1 and Locus 2 both have rings of moderate to dense distributions of daub with central voids. Locus 2 has an especially dense deposit of daub (~20 grams) to the southwest, between it and the Fort Ancient burial mound. Additionally, there is a significant amount of daub (~10 grams) approximately 50m to the west of Locus 1. This auger also produced significant amounts of ceramics, lithics, and carbon and may represent a pit or potentially a structure which is not evident in geophysical data. Similarly, another dense deposit of daub (~11 grams) is located near where Oehler (1973) discovered a prehistoric structure, approximately 20m northeast of Locus 1. Overall, the distribution of daub is consistent with the distribution of other domestic artifacts discussed thus far, and may also allude to structures not evident in the magnetic survey.

Daub in the plowzone is restricted primarily to areas that are slightly offset from both Locus 1 and Locus 2 (Figure A.23), in addition to one hot spot near the historic farmstead where Oehler (1973) found a prehistoric structure. This likely reflects the
structure of the loci, which was subsequently skewed by plowing. Sub-plowzone daub more specifically reflects the structure of Locus 1 and Locus 2, as suggested by previous artifact types (Figure A.24). Although generally low in density, daub is concentrated in four sub-plowzone augers. One is located in Locus 1, one in Locus 2, as would be expected from residential areas. The third is located near where Oehler (1973) discovered a prehistoric structure, and mirrors the plowzone representation. The final high density of daub is located along on the edge of the terrace, near concentrations of limestone, grit, and shell-tempered ceramics, as noted above.

**Carbon**

Carbonized wood was recovered at numerous sample locations (Figure A.25). Specifically, high densities of carbon are distributed in and around both Locus 1 and Locus 2, suggesting that burning occurred in both areas. Carbon was also found in the area 50m west of Locus 1 as well as in the probable pit noted toward the southwestern part of the landform. It is important in this case to note differences between plowzone carbon, which may be historic in origin, and sub-plowzone carbon, which more certainly reflects prehistoric behaviors. Plowzone carbon is isolated to two hotspots (Figure A.26). The first is located within Locus 1. The second is located between the two loci, north of the Fort Ancient burial mound. Smaller amounts of carbon were recovered running along the terrace ridge to the southwest, as well as within Locus 2. The distribution of plowzone carbon, while in some ways mapping onto prehistoric patterns identified in this survey, is suspect because historic burning could produce carbon visually indistinguishable from prehistoric burning. Sub-plowzone carbon is a more important indicator of prehistoric occupation. At depths below 30cm, carbon is concentrated along the eastern edge of Locus 1, and throughout Locus 2, especially on the eastern side of this area (Figure A.27). In each case, this may speak to similar systems of burned refuse disposal. Secondary concentrations appear along the northwestern edge of the terrace, as well as in an isolated context on the southwestern edge of the landform, an area previously hypothesized to be a refuse pit.
Shell

Freshwater mussels were a common element in prehistoric diets in this region (Genheimer and Hedeen 2014). Since this terrace rarely floods, shell should be primarily deposited as a result of human activity. As such, the distribution of mussel shell should provide information in regard to the structure of refuse deposits at the site. Shell is distributed primarily through the center of Locus 1, with a high-density location on the western edge (Figure A.28). Shell is also found in high amounts in Locus 2, where it is distributed linearly. Shell is found in moderate amounts in a few other isolated locations, but otherwise is generally constrained to the two loci described above.

Mussel shell located in the plowzone is located in high densities throughout both loci, as well as in three isolated locations (Figure A.29). Two concentrations of shell are on the slope off of the northeastern and northwestern terrace edges. The last is just north of where the Fort Ancient burial mound was located. Sub-plowzone mussel shell is more tightly constrained to both Locus 1 and Locus 2 (Figure A.30). Like many elements discussed above, the concentration of shell in Locus 1 is on the interior of the ring of magnetic anomalies. In Locus 2, shell is distributed linearly along the northern edge of this area. Shell is also located in the northwest segment of the terrace, near where carbon, ceramics and other artifacts were recovered.

Rock

Fire-cracked rock (FCR) is a frequent result of earth oven and hot rock cooking that was common among the prehistoric inhabitants of the Eastern Woodlands. These typically granitic rocks were used to heat ceramics and food, but were often broken as a result of reheating. Rock fragments were typically either left in the earth oven, which was then filled with refuse, or moved to a secondary disposal location. FCR is densely distributed in three locations (Figure A.31). First, FCR is concentrated along the western edge of Locus 1. Second, two augers in Locus 2 produced large amounts of FCR. A final concentration is located near where the Fort Ancient burial mound was located.

Limestone, which naturally outcrops in the uplands near Turpin, was recovered throughout most of the landform (Figure A.32). It is particularly found near where a Late
Woodland stone burial mound was excavated in the 1940's. This is likely a result of limestone being redistributed during excavation and subsequently plowed throughout the area. Notably, limestone is one of the only types of material recovered from near the early Fort Ancient earthen burial mound.

The distribution of plowzone FCR is limited to the east side of Locus 1 and two isolated points in Locus 2 (Figure A.33). Two additional isolated areas of FCR are just north of the Fort Ancient burial mound and off the northeast slope of the terrace. Sub-plowzone FCR is distributed contrary to the structures of Locus 1 and Locus 2 identified thus far (Figure A.34). Specifically, in Locus 1, FCR is distributed along the western and southern edges of the circle of geophysical anomalies. In Locus 2, FCR is distributed primarily in the center of the circle of potential structures, as well as to the south of this area. These distributions may represent midden deposits of cooking refuse or potentially earth ovens hit by the auger survey.

Plowzone limestone was recovered predominately to the east of the Turpin farmhouse and around the edges of Locus 2 (Figure A.35). This pattern is similar below the plowzone, although the limestone in Locus 2 is located more toward the center and southern end of area (Figure A.36). The dense cluster near the farmstead is likely the result of Oehler’s excavations of a stone burial mound located in this area; it is assumed that the limestone from this mound was to some extent scattered by excavations and subsequent plowing. Notably, in the sub-plowzone distribution, one auger in the center of this concentration appears to be void of limestone. This is not the case, however; this auger was so densely filled with rock that it could not be completed below 30cm.
Appendix A Figures

Figure A.35: Ceramics recovered from systematic auger survey. All levels.

Figure A.36: Shell tempered ceramics recovered from systematic auger survey. All levels.
Figure A.37: Shell tempered ceramics recovered from systematic auger survey. All levels.

Figure A.38: Limestone tempered ceramics recovered from systematic auger survey. All levels.
Figure A.39: Ceramics recovered from systematic auger survey. Plowzone.

Figure A.40: Ceramics recovered from systematic auger survey. Sub-plowzone.
Figure A.41: Shell tempered ceramics recovered from systematic auger survey. Plowzone.

Figure A.42: Grit tempered ceramics recovered from systematic auger survey. Plowzone.
Figure A.43: Limestone tempered ceramics recovered from systematic auger survey. Plowzone.

Figure A.44: Shell tempered ceramics recovered from systematic auger survey. Sub-plowzone.
Figure A.45: Grit tempered ceramics recovered from systematic auger survey. Sub-plowzone.

Figure A.46: Limestone tempered ceramics recovered from systematic auger survey. Sub-plowzone.
Figure A.47: Lithics recovered from systematic auger survey. All levels.

Figure A.48: Lithics recovered from systematic auger survey. Plowzone.
Figure A.49: Lithics recovered from systematic auger survey. Sub-plowzone.

Figure A.50: All bone recovered from systematic auger survey. All levels.
Figure A.51: Burned bone recovered from systematic auger survey. All levels.

Figure A.52: All bone recovered from systematic auger survey. Plowzone.
Figure A.53: Burned bone recovered from systematic auger survey. Plowzone.

Figure A.54: All bone recovered from systematic auger survey. Sub-plowzone.
Figure A.55: Burned bone recovered from systematic auger survey. Sub-plowzone.

Figure A.56: Daub recovered from systematic auger survey. All levels.
Figure A.57: Daub recovered from systematic auger survey. Plowzone.

Figure A.58: Daub recovered from systematic auger survey. Sub-plowzone.
Figure A.59: Carbon recovered from systematic auger survey. All levels.

Figure A.60: Carbon recovered from systematic auger survey. Plowzone.
Figure A.61: Carbon recovered from systematic auger survey. Sub-plowzone.

Figure A.62: Mussel shell recovered from systematic auger survey. All levels.
Figure A.63: Mussel shell recovered from systematic auger survey. Plowzone.

Figure A.64: Mussel shell recovered from systematic auger survey. Sub-plowzone.
Figure A.65: Fire-cracked rock (FCR) recovered from systematic auger survey. All levels.

Figure A.66: Limestone recovered from systematic auger survey. All levels.
Figure A.67: Fire-cracked rock (FCR) recovered from systematic auger survey. Plowzone.

Figure A.68: Fire-cracked rock (FCR) recovered from systematic auger survey. Sub-plowzone.
Figure A.69: Limestone recovered from systematic auger survey. Plowzone.
Figure A.70: Limestone recovered from systematic auger survey. Sub-plowzone.
Appendix B: Ceramic Data
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Table B.29: House 1 Vessel Types

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Table B.30: House 1 Surface Treatment - Rim sherds

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</thead>
<tbody>
<tr>
<td>Indeterminate</td>
<td>153</td>
<td>33.2</td>
</tr>
<tr>
<td>Undecorated</td>
<td>281</td>
<td>61.0</td>
</tr>
<tr>
<td>Incised</td>
<td>21</td>
<td>4.6</td>
</tr>
<tr>
<td>Painted</td>
<td>5</td>
<td>1.1</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>.2</td>
</tr>
<tr>
<td>Total</td>
<td>461</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table B.31: House 1 ceramic decoration types - Rim sherds

<table>
<thead>
<tr>
<th>Type</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate</td>
<td>61</td>
<td>13.2</td>
</tr>
<tr>
<td>Flared</td>
<td>38</td>
<td>8.2</td>
</tr>
<tr>
<td>Incurvate</td>
<td>4</td>
<td>0.9</td>
</tr>
<tr>
<td>Slightly Flared</td>
<td>241</td>
<td>52.3</td>
</tr>
<tr>
<td>Slightly Incurvate</td>
<td>35</td>
<td>7.6</td>
</tr>
<tr>
<td>Straight</td>
<td>66</td>
<td>14.3</td>
</tr>
<tr>
<td>Total</td>
<td>445</td>
<td>96.5</td>
</tr>
</tbody>
</table>

Table B.32: House 1 Ceramics - Rim Flare
<table>
<thead>
<tr>
<th>Lip Description</th>
<th>Frequency</th>
<th>Percent</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate</td>
<td>18</td>
<td>3.9</td>
<td></td>
</tr>
<tr>
<td>Flat</td>
<td>70</td>
<td>15.2</td>
<td></td>
</tr>
<tr>
<td>Flat/Pointed</td>
<td>24</td>
<td>5.2</td>
<td></td>
</tr>
<tr>
<td>Flat/Rounded</td>
<td>96</td>
<td>20.8</td>
<td></td>
</tr>
<tr>
<td>Narrow/Pointed</td>
<td>81</td>
<td>17.6</td>
<td></td>
</tr>
<tr>
<td>Rounded</td>
<td>172</td>
<td>37.3</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>461</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table B.33: House 1 Ceramics - Lip Description

<table>
<thead>
<tr>
<th>Rim Decoration</th>
<th>Frequency</th>
<th>Percent</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate</td>
<td>28</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>403</td>
<td>87.4</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>30</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>461</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table B.34: House 1 Ceramics - Rim Decoration

<table>
<thead>
<tr>
<th>Rim Sherd Temper</th>
<th>Frequency</th>
<th>Percent</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Grit</td>
<td>35</td>
<td>7.6</td>
<td></td>
</tr>
<tr>
<td>Grit/Shell</td>
<td>17</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>Shell</td>
<td>161</td>
<td>34.9</td>
<td></td>
</tr>
<tr>
<td>Sand</td>
<td>6</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Shell/Grit</td>
<td>238</td>
<td>51.6</td>
<td></td>
</tr>
<tr>
<td>Shell/Grog</td>
<td>4</td>
<td>.9</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>461</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table B.35: House 1 Ceramics - Rim sherd temper (complex)

<table>
<thead>
<tr>
<th>Rim Sherd Temper</th>
<th>Frequency</th>
<th>Percent</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock</td>
<td>35</td>
<td>7.6</td>
<td></td>
</tr>
<tr>
<td>Shell</td>
<td>420</td>
<td>91.1</td>
<td></td>
</tr>
<tr>
<td>Sand</td>
<td>6</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>461</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table B.36: House 1 Ceramics - Rim sherd temper (simple)
<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Range</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>Std. Error</th>
<th>Std. Dev.</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rim Diameter</td>
<td>334</td>
<td>52</td>
<td>2</td>
<td>54</td>
<td>26.59</td>
<td>0.55</td>
<td>10.13</td>
<td>102.55</td>
</tr>
<tr>
<td>Max. Rim Thickness</td>
<td>425</td>
<td>13.10</td>
<td>3.30</td>
<td>16.40</td>
<td>8.52</td>
<td>0.10</td>
<td>2.16</td>
<td>4.67</td>
</tr>
<tr>
<td>Thickness Below Rim</td>
<td>410</td>
<td>10.00</td>
<td>2.60</td>
<td>12.60</td>
<td>6.91</td>
<td>0.09</td>
<td>1.73</td>
<td>2.99</td>
</tr>
<tr>
<td>Rim Fold Height</td>
<td>91</td>
<td>22.40</td>
<td>7.50</td>
<td>29.90</td>
<td>17.08</td>
<td>0.49</td>
<td>4.68</td>
<td>21.87</td>
</tr>
<tr>
<td>Appendage Width at Midpoint</td>
<td>3</td>
<td>15.50</td>
<td>27.60</td>
<td>43.10</td>
<td>37.20</td>
<td>4.84</td>
<td>8.39</td>
<td>70.33</td>
</tr>
<tr>
<td>Appendage Width at Base</td>
<td>3</td>
<td>9.90</td>
<td>26.90</td>
<td>36.80</td>
<td>31.53</td>
<td>2.88</td>
<td>4.98</td>
<td>24.80</td>
</tr>
<tr>
<td>Appendage Max Length</td>
<td>3</td>
<td>3.70</td>
<td>58.00</td>
<td>61.70</td>
<td>59.67</td>
<td>1.08</td>
<td>1.88</td>
<td>3.52</td>
</tr>
<tr>
<td>Appendage Max Width</td>
<td>3</td>
<td>46.00</td>
<td>31.60</td>
<td>77.60</td>
<td>56.13</td>
<td>13.37</td>
<td>23.15</td>
<td>536.05</td>
</tr>
</tbody>
</table>

Table B.37: House Block 1 Rim sherd descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incised</td>
<td>100</td>
<td>67.6</td>
</tr>
<tr>
<td>Paint</td>
<td>47</td>
<td>31.8</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>148</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table B.38: House Block 1 Neck Decoration

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate Incised</td>
<td>40</td>
<td>27.0</td>
</tr>
<tr>
<td>Curvilinear Guilloche</td>
<td>52</td>
<td>35.1</td>
</tr>
<tr>
<td>Curvi-Rectilinear Guilloche</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td>Ramey-like</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Incised Angular</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Punctates</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Positive Paint</td>
<td>44</td>
<td>29.7</td>
</tr>
<tr>
<td>Negative Paint</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Red Slip</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>148</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table B.39: House Block 1 Neck Sherds - Decoration types
<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grit</td>
<td>4</td>
<td>2.7</td>
</tr>
<tr>
<td>Shell</td>
<td>50</td>
<td>33.8</td>
</tr>
<tr>
<td>Shell/Grit</td>
<td>91</td>
<td>61.5</td>
</tr>
<tr>
<td>Shell/Grog</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>148</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table B.40: House Block 1 Neck Sherds - Temper (complex)

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock</td>
<td>4</td>
<td>2.7</td>
</tr>
<tr>
<td>Shell</td>
<td>144</td>
<td>97.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>148</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table B.41: House Block 1 Neck Sherds - Temper (simple)

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cordmarked</td>
<td>15</td>
<td>10.1</td>
</tr>
<tr>
<td>Cordmarked below shoulder</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Plain</td>
<td>129</td>
<td>87.2</td>
</tr>
<tr>
<td>Possible stamped</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>148</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table B.42: House Block 1 Neck Sherds - Surface Treatment

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate</td>
<td>20</td>
<td>4.3</td>
</tr>
<tr>
<td>Bowl</td>
<td>48</td>
<td>10.4</td>
</tr>
<tr>
<td>Plate</td>
<td>1</td>
<td>.2</td>
</tr>
<tr>
<td>Jar</td>
<td>344</td>
<td>74.5</td>
</tr>
<tr>
<td>Short-necked Jar</td>
<td>6</td>
<td>1.3</td>
</tr>
<tr>
<td>Jar or Bowl</td>
<td>43</td>
<td>9.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>462</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table B.43: House Block 2 Vessel Types
<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate</td>
<td>99</td>
<td>21.4</td>
</tr>
<tr>
<td>Cordmarked</td>
<td>78</td>
<td>16.9</td>
</tr>
<tr>
<td>Plain</td>
<td>284</td>
<td>61.5</td>
</tr>
<tr>
<td>Fabric Impressed</td>
<td>1</td>
<td>.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>462</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table B.44: House Block 2 - Rim Sherd Surface Treatment

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grit</td>
<td>49</td>
<td>10.6</td>
</tr>
<tr>
<td>Grit/Shell</td>
<td>28</td>
<td>6.1</td>
</tr>
<tr>
<td>Shell</td>
<td>175</td>
<td>37.9</td>
</tr>
<tr>
<td>Sand</td>
<td>5</td>
<td>1.1</td>
</tr>
<tr>
<td>Shell/Grit</td>
<td>202</td>
<td>43.7</td>
</tr>
<tr>
<td>Shell/Grog</td>
<td>3</td>
<td>.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>462</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table B.45: House Block 2 Rim Sherd Temper (complex)

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock</td>
<td>49</td>
<td>10.6</td>
</tr>
<tr>
<td>Shell</td>
<td>408</td>
<td>88.3</td>
</tr>
<tr>
<td>Sand</td>
<td>5</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>462</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table B.46: House Block 2 Rim Sherd Temper (simple)

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate</td>
<td>63</td>
<td>13.6</td>
</tr>
<tr>
<td>Flared</td>
<td>27</td>
<td>5.8</td>
</tr>
<tr>
<td>Incurvate</td>
<td>2</td>
<td>.4</td>
</tr>
<tr>
<td>Slightly Flared</td>
<td>272</td>
<td>58.9</td>
</tr>
<tr>
<td>Slightly Incurvate</td>
<td>51</td>
<td>11.0</td>
</tr>
<tr>
<td>Straight</td>
<td>47</td>
<td>10.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>462</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table B.47: House Block 2 Rim Curvature
<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate</td>
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</tr>
<tr>
<td>No</td>
<td>285</td>
</tr>
<tr>
<td>Yes</td>
<td>141</td>
</tr>
<tr>
<td>Total</td>
<td>462</td>
</tr>
</tbody>
</table>

Table B.48: House Block 2 Rim Fold

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate</td>
<td>36</td>
</tr>
<tr>
<td>Flat</td>
<td>88</td>
</tr>
<tr>
<td>Flat/Pointed</td>
<td>8</td>
</tr>
<tr>
<td>Flat/Rounded</td>
<td>43</td>
</tr>
<tr>
<td>Narrow/Pointed</td>
<td>136</td>
</tr>
<tr>
<td>Rounded</td>
<td>151</td>
</tr>
<tr>
<td>Total</td>
<td>462</td>
</tr>
</tbody>
</table>

Table B.49: House Block 2 Rim Form

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate</td>
<td>41</td>
</tr>
<tr>
<td>No</td>
<td>385</td>
</tr>
<tr>
<td>Yes</td>
<td>36</td>
</tr>
<tr>
<td>Total</td>
<td>462</td>
</tr>
</tbody>
</table>

Table B.50: House Block 2 Rim Decoration

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Minimum</td>
</tr>
<tr>
<td>Rim Diameter</td>
<td>301</td>
</tr>
<tr>
<td>Rim Percent Complete</td>
<td>301</td>
</tr>
<tr>
<td>Max Rim Thickness</td>
<td>402</td>
</tr>
<tr>
<td>Thickness Below Rim</td>
<td>390</td>
</tr>
<tr>
<td>Rim Fold Height</td>
<td>129</td>
</tr>
<tr>
<td>Appendage Width at Midpoint</td>
<td>11</td>
</tr>
<tr>
<td>Appendage Width at Base</td>
<td>11</td>
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<tr>
<td>Appendage Length</td>
<td>11</td>
</tr>
<tr>
<td>Appendage Max Width</td>
<td>12</td>
</tr>
</tbody>
</table>

Table B.51: House Block 2 Rim Sherd Descriptive Statistics
<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grit</td>
<td>4</td>
<td>.8</td>
</tr>
<tr>
<td>Grit/Shell</td>
<td>8</td>
<td>1.6</td>
</tr>
<tr>
<td>Shell</td>
<td>223</td>
<td>43.9</td>
</tr>
<tr>
<td>Sand</td>
<td>1</td>
<td>.2</td>
</tr>
<tr>
<td>Shell/Grit</td>
<td>266</td>
<td>52.4</td>
</tr>
<tr>
<td>Shell/Grog</td>
<td>6</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>508</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table B.52: House Block 2 Neck Sherd Temper (complex)

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock</td>
<td>4</td>
<td>.8</td>
</tr>
<tr>
<td>Shell</td>
<td>503</td>
<td>99.0</td>
</tr>
<tr>
<td>Sand</td>
<td>1</td>
<td>.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>508</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table B.53: House Block 2 Neck Sherd Temper (simple)

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate</td>
<td>14</td>
<td>2.8</td>
</tr>
<tr>
<td>Cordmarked</td>
<td>77</td>
<td>15.2</td>
</tr>
<tr>
<td>Plain</td>
<td>417</td>
<td>82.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>508</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table B.54: House Block 2 Neck Sherd Surface Treatment

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incised</td>
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<td>90.4</td>
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<tr>
<td>Paint</td>
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<td>7.1</td>
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<tr>
<td>Other</td>
<td>13</td>
<td>2.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>508</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table B.55: House Block 2 Neck Sherd Decoration
<table>
<thead>
<tr>
<th>Decoration Style</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indeterminate Incised</td>
<td>154</td>
<td>30.3</td>
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<tr>
<td>Curvilinear Guilloche</td>
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<td>48.6</td>
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<tr>
<td>Rectilinear Guilloche</td>
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<td>1.0</td>
</tr>
<tr>
<td>Curvi-rectilinear Guilloche</td>
<td>7</td>
<td>1.4</td>
</tr>
<tr>
<td>Line-filled Triangle</td>
<td>17</td>
<td>3.3</td>
</tr>
<tr>
<td>Ramey-like</td>
<td>4</td>
<td>.8</td>
</tr>
<tr>
<td>Incised Angular</td>
<td>12</td>
<td>2.4</td>
</tr>
<tr>
<td>Punctate</td>
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<td>.2</td>
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<tr>
<td>Positive Paint</td>
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<td>6.7</td>
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<tr>
<td>Negative Paint</td>
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<tr>
<td>Slip - red</td>
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<td>.2</td>
</tr>
<tr>
<td>Other</td>
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<td>.4</td>
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<td>Burnished</td>
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<tr>
<td>Incised/punctate</td>
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<td>2.6</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>508</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table B.56: House Block 2 Neck Sherd Decoration Styles
Appendix C: Test Units
Test Unit 1

Test Unit 1 is a 1x2 meter unit located in the central part of the landform, within Locus 1, which exhibits geophysical anomalies interpreted as structures. This unit is located at North 1019, East 937 near Auger 14. This auger contained significant amounts of bone, ceramics, lithics, fire-cracked rock, and burned clay/daub, suggesting midden or habitation deposits. Coupled with the fact that this location is at the edge of the circular ring of geophysical anomalies, it represents a promising location for understanding the nature of occupation in this part of the landform. The unit was excavated between June and July of 2014.

As a result of the time-intensive nature of the 2015 excavations, the material from Test Unit 1 has not been extensively analyzed. However, an important feature was encountered during excavation. It is important to note that formation processes in this area, which is close to the historic homestead (note the disturbance in the magnetometry map in Chapter 6). The plow disturbance and historic accumulation in this area was deeper than that in the areas near either House 1 or House 2. Approximately 40cm of historic disturbance was encountered, along with a few deeper historic artifacts (to approximately 50cm). This prevented identification of prehistoric features until subsoil was encountered at approximately 80cm below surface. Features were also identified in wall profiles after excavation. For this reason, much of the material culture can be considered mixed and thus level data are only useful in generalization.

At the base of Test Unit 1, a linear feature (Feature 1) was identified that ran diagonally across the southwest corner of the unit (Figure C.1). Upon excavation, this feature was found to be a portion of a wall trench, with a small portion of structural fill in the extreme southwest corner of the unit (Figure C.2 and Figure C.3). The remainder of the unit is comprised of midden fill and the edge of a pit. Carbon samples from a post within Feature 1 places this structure at AD. The west profile, which captured the wall trench, suggests that this structure may have cut into an earlier, more organic midden (Figure C.4). This finding is consistent with House 1, which was shown to have been excavated into a preceding Late Woodland midden.
As noted above, material culture from Test Unit 1 reflects a mixture of Fort Ancient and Late Woodland contexts because of significant historic disturbance. In general, findings are consistent with those from House 1. Seven bifaces were recovered (Figure C.5). Those from Level 3 (40-50cmbs) reflect a drill, a biface fragment, and a broken Type 2 triangular point. Three from Level 4 (50-60cmbs) reflect a triangle point tip, a Type 2 triangular point, and a small corner-notched point similar to those recovered from House 1. The only biface recovered from Level 5 (60-70cmbs) was a broken Lowe Cluster spear point.

Ceramics from Test Unit 1 have not been analyzed in detail, but appear to reflect an assemblage similar to that of House 1. In particular, the majority of sherds are shell tempered, plain, and exhibit little decoration. A small number of rock tempered sherds, including what could be classified as a “Newtown shoulder,” were recovered. Although at this point qualitative characterization of the assemblage is lacking, I am comfortable suggesting that the assemblage from Test Unit 1 is qualitatively similar to that of House Block 1. Future work will help test this observation.

**Test Unit 2**

Test Unit 2 is a 1x2 meter unit located on the eastern part of the landform, near Locus 2, at North 989, East 1038. The unit was placed such that Auger 99 was in the eastern half of the unit. Auger 99 was one of the most promising augers, in that it produced significant amounts of burned earth, along with significant amounts of grit and shell tempered ceramics, bone, burned clay/daub, limestone, and carbon. Additionally, it is located near the ring of relatively ephemeral circular geophysical anomalies, one of which was House 2. A potential pit feature is also near this location. Placement of this unit allows for exploration of the eastern portion of the terrace. This unit was excavated between 2014 and 2015.

As a result of the time-intensive nature of the 2015 excavations, the material from Test Unit 2 has not been extensively analyzed. Test Unit 2 was also less intensely excavated than Test Unit 1. This is in part a result of the generally shallow nature of the landform (the plowzone ended at approximately 25cmbs) as well as the fact that
excavation was cut short by winter and the beginning of the comparatively more intense 2015 field season. Excavation produced two Features of note, Feature 3 and Feature 6. Feature 3 was a Fort Ancient trash pit that was encountered at the base of the plowzone at 24cm below surface level (Figure C.6). The remains of this pit included predominately shell tempered ceramics with curvilinear guilloche and some rectilinear motifs. Although the sample is small, the ceramics were consistent with subsequent findings in this area of the site in House Block 2. Also included were two drilled canine pendants.

Feature 6 was a cluster of fire-cracked rock identified at approximately 40cm below surface (Figure C.7). This was interpreted as the remains of an episode of hot rock cooking, although very few artifacts were recovered. This feature dates to AD (Figure C.8).

These features were interspersed with mixed Fort Ancient and Late Woodland midden material, often making it difficult to identify boundaries. The non-feature midden included both shell and rock tempered ceramics as well as one Type 5 triangular point. All things considered, this area of the site is consistent with the complicated stratigraphic and cultural history encountered upon excavation of House Block 2.
Appendix C Figures

Figure C.8: Test Unit 1, Feature 1 (Wall Trench) at 80cmbs
Figure C.9: Test Unit 1, Feature 1 at base of Wall Trench (~90cmbs).
Figure C.10: Test Unit 1, Feature 1 – Wall trench posts excavated
Figure C.11: Test Unit 1, West Profile at 80cmbs.
Figure C.12: Bifaces recovered from Test Unit 1, arranged by level
Figure C.13: Test Unit 2, Feature 3 at 24cmbs.

Figure C.14: Test Unit 2, Feature 6 at 40cmbs