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Reassessing the History of the Poverty Point Phenomenon: A Case Study from the Jaketown Site, Mississippi, USA

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by
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ABSTRACT OF THE DISSERTATION

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Towards the end of the Late Archaic period (ca. 4800-3000 cal BP), between 3,600 and 3,300 years ago, Native Americans engineered a colossal earthwork complex that covers approximately 200 hectares in northeast Louisiana. Today, it is a UNESCO World Heritage site known as Poverty Point and the namesake for a material culture pattern documented to varying degrees at sites throughout the Lower Mississippi Valley (LMV). However, the nature of interactions between these sites and the type site is poorly understood. The people who constructed the Poverty Point site lived on wild food resources. They hunted, fished, and gathered food from the river bottoms and surrounding woodlands more than 1,000 years before food production became widespread in the region. The level of sociopolitical organization required to create such a place contradicts anthropological theories regarding the social structure of foraging societies. Consequently, the Poverty Point site is a globally relevant example of highly complex behavior by small-scale societies that lack obvious signs of social hierarchy. The mounds at Poverty Point were among the first built in the Eastern Woodlands after a millennium-long hiatus, and their enormous scale was unlike anything that came before and matched those of Mississippian chiefdoms two millennia later.

To better understand the events that led to the creation of the Poverty Point site and the historical processes that comprised the poorly understood Poverty Point phenomenon, I conducted four research expeditions at the Jaketown site in west-central Mississippi. Covering approximately 85 hectares, Jaketown is the largest Poverty Point-affiliated site outside the type site. Jaketown also has the most earthworks of any Poverty Point-affiliated site other than the type site. There have been 15 mounds documented at Jaketown, including at least three Late Archaic period constructions. Furthermore, the material assemblage documented at Jaketown shows a high degree of similarity with the type site. These factors combine to make Jaketown a critical site for understanding the historical processes that led to the creation of the Poverty Point site. Extant regional histories situate Poverty Point as a center of innovation that exported material culture, practices, and cultural identity to presumably contemporary sites in the region. The data generated by my research contradict this model. We processed 11 new AMS 14C samples, adding to the existing 22, and I created a high-resolution chronological model of site occupation at Jaketown. The model, combined with artifacts, geoarchaeological, and paleoethnobotanical data, demonstrate that some practices considered to originate at Poverty Point, such as mound building and the importation of nonlocal lithics, occurred first at Jaketown.

Our work also demonstrates that categorical frameworks that employ typological entities like the archaeological culture and the type site bias regional histories by suggesting radial diffusion of cultural identity from a center to a periphery. These biases are compounded when chronological control is poor because typological entities stand in for absolute time, which artificially flattens the regional chronology and implies that innovations and cultural identity originate at the type site, or center, and spread to the periphery, which is assumed to be contemporary in time. Our findings support an inversion of most extant models. Communities throughout the LMV, like the one at Jaketown, did not receive their cultural identity from the Poverty Point site. Rather, they had their own traditions, practices, and histories that converged on Poverty Point. In this model, Poverty Point is not a source of outward diffusion but an endpoint for multiple streams of Native American history–it was a cultural sink where disparate histories combined to form one of the most unique archaeological signatures in the world. The need for an alternative framing is apparent after acknowledging the flaws of typological frameworks. I found that using Native American philosophies as theory is a useful approach. Relying on insights from American Indian scholars, the burst of mound building at Jaketown ca. 3400 cal BP was a form of communal performance meant to restore balance to relations that were in flux, manifested as environmental volatility, which is well documented at Jaketown and throughout the LMV. When the volatility continued, the occupants of Jaketown deliberately decommissioned what had become a powerful, mounded landscape. Considering the equally eventful burst of earth moving that occurred at the Poverty Point site shortly afterward, I argue that the community at Jaketown went to Poverty Point, along with others, and added to the monumental complex there through a multi-community performance, like the one at Jaketown but on a much larger scale.

Chapter 1:

The History of Mound Building in North America and Anthropological Interest in Social Complexity

1.1 Introduction

The oldest earthen mounds in North America are found in the Lower Mississippi Valley (LMV) and were built during the Middle Archaic period by small-scale foraging societies beginning ca. 6,000 years ago, but perhaps as early as 7,000 years ago, in today's Louisiana (Saunders 2012: 25). Current evidence suggests Middle Archaic mound-building groups were egalitarian, did not engage in much long-distance exchange, and were politically autonomous communities (Gibson 2019: 16; Saunders 2012: 26). Middle Archaic mounds were planned using a basic unit of measurement and some complexes share the same layout plan (Clark 2004; Sassaman and Heckenberger 2004). For reasons currently unknown, mound building ceased at ca. 4800 cal BP, and the hiatus lasted more than a millennium (Arco et al. 2006; Gibson 1996: 44, 2006, 2019: 3; Kidder 2006; Kidder and Sassaman 2009: 680; Saunders 2010, 2012). The widescale and simultaneous cessation of the practice across different environments suggests a social cause rather than an environmental one, and current evidence for the latter is insufficient (Saunders 2010: 237). Mound building began again during the Late Archaic Poverty Point period (ca. 3400 cal BP). There was another region-wide lull in mound building after the Poverty Point period that lasted until the tradition was revived once again during the Early Woodland period (ca. 2400 cal BP) and continued to intensify through the Mississippian period (beginning ca. 1000 cal BP) (Kidder et al. 2010; Saunders 2010: Figures 12.1, 12.2). The cyclical nature of mound building over the millennia leads to important anthropological questions. Why did traditions of monumentality come and go, sometimes ceasing for hundreds or even thousands of years? What were the social institutions and historical contingencies behind the resurgence of the practice during the Late Archaic period? Mound building was clearly central to the underlying logic of sites like Poverty Point and Jaketown (Gibson 2019: 52; Kidder 2011: 113-114) (Figure 1.1). At Poverty Point, some have argued that revitalizing the practice tapped into the older traditions represented by antecedent Middle Archaic mounds, a hypothesis perhaps supported by the fact that the mounds at Poverty Point were laid out on an axis that intersects a nearby Middle Archaic earthwork, seemingly citing the older mounds (Clark 2004; Gibson 2000; Kidder 2011). There is nothing quite comparable to the Poverty Point site which has been called an enigma, the culture that did not fit (Ford et al. 1956: 14; Gibson 1996), and a historical paradox (Gibson 1996, 2000).There are many reasons why the social complexity evident at Poverty Point and related sites has defied easy explanation, and in many ways, the paradoxical nature of Poverty Point stems from its genuinely unique character. However, there are also conceptual biases inherent in our terminology that prevent us from imagining hunter-gatherer complexity and variability (*sensu* Ames 2004). For example, the term Archaic, coined by William Ritchie (1932), was an era defined by the lack of pottery, agriculture, and sedentism and reflects a teleological sequence that is inseparable from Western notions of progress (Sassaman 2010: 3). The Archaic is defined by the attributes it lacks, and due to these perceived deficiencies, Archaic foragers have been understood as closer to nature. Thus, social change in foraging societies is often explained by external factors such as the environment or subsistence needs (Kidder 2011; Sassaman and Randall 2012). Historically, when Archaic period sites in the LMV produced unexpected traits, such as early pottery, they were assigned to the so-called Formative stage, a more progressive category that created a hybrid slot for innovations thought to first arise in the Woodland period (Ford 1969; Gibson 1996: 297; Willey and Phillips 1958).

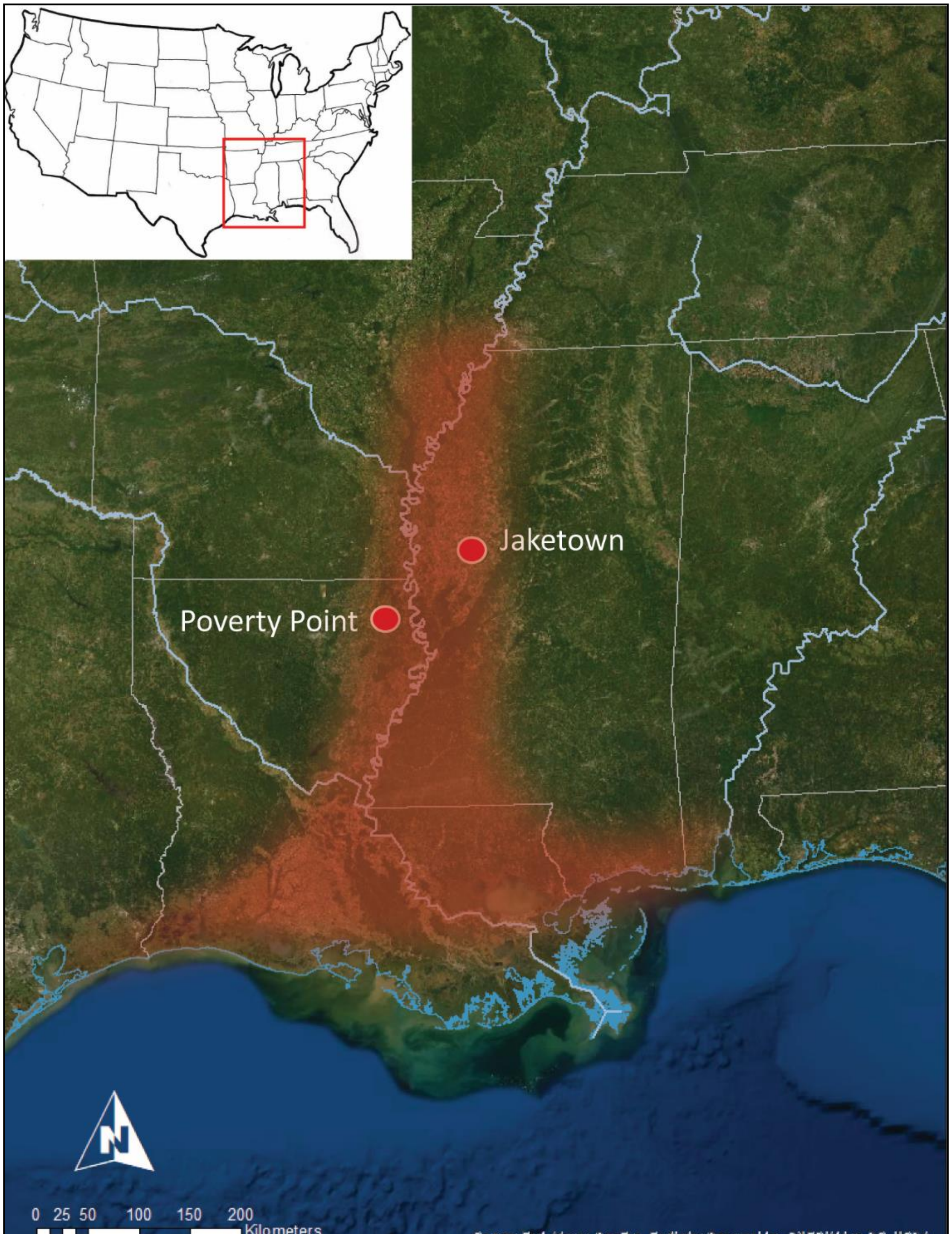

Figure 1.1. Map showing the Lower Mississippi Valley and Poverty Point culture area (transparent red shape), and the Poverty Point and Jaketown sites.

These conceptual biases have also influenced how archaeologists explain the role of monumentality in Archaic period societies, which have tended to overemphasize the mundane (e.g., subsistence, economy, territoriality, etc.) at the expense of the social compared to later Middle Woodland and Mississippian period monuments (Russo 1994). One reason for this is how subsistence pursuit was linked to social complexity in anthropology. Traditionally, the guiding assumption was that monuments, a clear marker of social complexity, were not constructed by foraging groups who were incapable of producing and storing large food surpluses (Arnold et al. 2016; Russo 1994; Saunders 1994). In the LMV, this paradigm began to change in the 1990s when archaeologists began to accept that some earthen mounds in the LMV dated to the Middle Archaic period (ca. 6000-4800 cal BP), thousands of years before the widescale adoption of agriculture (Russo 1994; Saunders and Allen 1994; Saunders et al. 1994; Saunders 1994). While not the oldest, the earthwork complex at the Poverty Point site is among the most elaborate and represents the apex of cultural elaboration and monumentality of the Archaic period, surpassing in scale anything that came before and much that would come after by an order of magnitude. For these reasons, the Poverty Point site and the communities that were part of the so-called Poverty Point culture are important case studies for understanding the range of social organization possibilities among non-agrarian societies. Furthermore, the Poverty Point phenomenon was a watershed moment in Native American history and important in its own right.

I began the research presented in this dissertation anticipating it would articulate with broader trends in anthropology dealing with complex hunter-gatherers, the role of monumentality in such societies, and flexible social organization strategies that could organize the requisite labor for projects while simultaneously lacking obvious signs of centralized authority (e.g., wealth differences, differential access to goods, and conspicuous adornment in burials). To some extent, my work does indeed engage with these topics. After all, the sprawling 200-hectare earthwork complex at the Poverty Point site is highly complex, as is the mounded landscape at Jaketown, even if on a much smaller scale. By complex, I mean that if you and I set out to replicate these earthworks, even if we were given a sufficient labor force, we would fail spectacularly. Creating geometric, mounded earth that can withstand millennia of erosion and other destructive forces entails an astonishing level of engineering prowess, ingenuity, and creative socio-political organization. By creative socio-political organization, I mean the rapid pace of earthwork construction documented at Poverty Point and Jaketown, suggests forms of social organization that contradict traditional models of small, egalitarian foraging groups defined by acephalous socio-political institutions. But anthropologists know relatively little about how pre-Columbian foraging societies organized themselves (Ames 2004), and there is ample ethnographic evidence (Lowie 1954: 113-115; Levi-Strauss: 1955: 305-317; Mauss 1906) of highly flexible social and political configurations among modern hunter-gatherers that facilitated situational leadership in ways that are arguably more complicated than permanent hierarchical institutions. As this situation pertains to Poverty Point research, it is likely our preconceived notions of hunter-gatherer sociality and creativity, or lack thereof, that are preventing us from understanding the socio-political arrangements behind the Poverty Point phenomenon.

However, the concept of social complexity leaves much to be desired when explaining archaeological phenomena and has been critically examined by anthropologists (Alt 2010; Dan-Cohen 2020; McIntosh 1999; Nelson 1995; Rowlands 1989; Wengrow 2001). One is inevitably faced with the highly subjective, and arguably arbitrary task, of articulating what is complex and what is not. Since the term complex hunter-gatherers appeared in the literature nearly 40 years ago (Price and Brown 1985: 3-20), debate has continued about what we mean by “complex” and which traits best indicate complexity. My engagement with the work of American Indian scholars, especially concerning broadly shared themes in Native American philosophies and epistemologies, has convinced me that the concept of social complexity in anthropology, including the complex hunter-gatherer concept, is incompatible with many Native worldviews that assume the world is defined by perpetual dynamism and complexity (Cajete 2000: 65; Cordova 2007: 70; Norton-Smith 2010: 73)–complexity is a given, not an attribute some groups achieve while others do not.

The interpretations presented in this dissertation are historical, not in the sense of listing the order of past events, but as the process of “making culture through social interactions” (Sassaman 2010: 5). Such an approach stands in contrast with materialist and evolutionary approaches, which have dominated Archaic period research, that often identify external catalysts of social change such as energetic, technological, or environmental conditions (Sassaman and Randall 2012: 19). These approaches tend to reduce cultural traditions and practices, such as mound building, as epiphenomena. I find that using Native American philosophies and epistemologies as theory to interpret my data lends itself to historical accounts of social change, but it should be noted that there are similar developments in anthropological theory, especially the group of related theories that are included under the term historical processualism (Cameron and Duff 2008; Cobb 2005; Clark et al. 2013; Pauketat 2001; Sassaman 2010). Both sets of literature have influenced my interpretations and underscore the promise of complimentary use of Western social theory and Indigenous scholarship (Atalay 2006, 2020).

1.2 A History of Research, The Poverty Point Phenomenon, and the Jaketown Site

1.2.1 Previous Research and the Formulation of the Poverty Point Culture Concept

Ford, Phillips, and colleagues conducted the first major excavations at Poverty Point and Jaketown in the 1950s (Ford et al. 1955; Ford and Webb 1956; Phillips et al. [1951] 2003). Their findings linked Jaketown to what Webb was calling the pre-ceramic cultures of Louisiana, which he detected first at Poverty Point (1948). It was through the work of Ford and colleagues that the Poverty Point culture first took form. The colossal earthworks, the extraordinary quantities and diversity of stone artifacts, clay figurines, and the sophisticated lapidary industry documented at Poverty Point, all in the absence of agriculture, confounded analysts (Webb 1968). Ford called it an enigma and the culture that did not fit the broader contours of the "prehistory" of the Eastern Woodlands (Ford and Webb 1956: 14). By the late 1960s, the list of sites with Poverty Point-like material assemblages was growing (Gagliano and Saucier 1963; Lazarus 1958; Webb 1968), and the Poverty Point culture was seen as the apex of cultural elaboration of the terminal Archaic period. The seemingly abrupt arrival of so many indicators of social complexity at Poverty Point led Ford to hypothesize waves of diffusion from complex cultures in Central and South America, resulting in what he called the American formative period (Ford 1969). Based on material assemblages, Phillips identified phases of the Poverty Point culture with especially strong clusters centered on the Poverty Point site and the Jaketown site (Phillips 1970: 872-876). As 14C data began to accumulate at the Poverty Point site, it became clear that the site predated many of the complex societies in Central and South America that Ford identified as sources of diffusion in his American Formative model. Consequently, Gibson modified the American Formative hypothesis and argued that the Poverty Point site was the seat of America's first indigenous chiefdom-level society, a development made possible by a bountiful riverine environment that circumvented the need for an agricultural subsistence base, which was seen as a requisite technological development for a chiefdom level society (Gibson 1974).

In 1982, Webb summarized Poverty Point culture research and tabulated cultural-taxonomic traits diagnostic of Poverty Point culture that included hand-shaped clay cooking balls called Poverty Point Objects (PPOs), tubular pipes, stone vessels, microflints, hematite and magnetite plummets, jasper beads, linear settlements and earthen mounds (1982: Table 18). This trait list, based heavily on data from the type site, was used to gauge the cultural affinity of sites throughout the LMV and their connections with the Poverty Point site. Jaketown exhibited the third greatest number of Poverty Point cultural traits, which cemented its status as an important regional center of the so-called Poverty Point culture (Webb 1982: 19). Research has continued at Poverty Point and related sites throughout the LMV (Byrd 1991; Connolly 2002a, 2002b; Exnicios and Woodiel 1990; Dalan et al. 2019; Haag 1990; Hargrave et al. 2021; Hays 2019; Hillman 1990; Kidder 2002; Kidder et al. 2004; Gibson 1983, 1984, 1986, 1987, 1989, 1990, 1996, 2000, 2006, 2007, 2010, 2019; Gibson and Carr 2004; Gibson and Griffing 1994; Gibson and Melancon 2004; Lear and Jeter 2019; Mainfort 1997; Sassaman and Brookes 2017; Saunders and Allen 2003; Schambach 2005). Scholars have contributed research on a wide range of topics, including settlement patterns (Jackson and Jeter 1991; Kidder 1991), technology (Hays and Weinstein 2004; Hays et al. 2016; Johnson 1983, 1993; Lauro and Lehmann 1982; Lehmann 1982; Lipo et al. 2012; Sassaman 1992), exchange (Gibson 1994; Hill et al. 2016; Jeter and Futato 1990; Jeter and Jackson 1994; Johnson 1980; Sherman III et al. 2022; Walthall et al. 1982), earthworks (Bloch 2019; Hargrave et al. 2007; Jackson and Jeter 1994; Kidder et al. 2021a; Ortmann and Kidder 2013; Saunders et al. 2001), astronomical alignments of mounds (Brecher and Haag 1983; Purrington 1983; Purrington et al. 1989; Romain and Davis 2013), and subsistence (Jackson 1982, 1990; Ward 1998). Additionally, environmental volatility during the mid to late fourth millennium BP has been documented in the LMV and implicated in the demise of the Poverty Point phenomenon and the stark differences in cultural elaboration between the Late Archaic Poverty Point period and the relatively simple subsequent Early Woodland period (Adelsberger and Kidder 2007; Kidder 2006, 2010; Kidder et al. 2008; 2018).

1.2.2 Models of Social Organization at the Poverty Point site

During the last three decades, there have been many attempts to explain the origin and social structure of the exceptional Poverty Point site. Gibson advanced various iterations of his highly adapted riverine chiefdom model (1994b, 1994c, 1994d, and 1998), which posited that leaders controlled the distribution of nonlocal lithics in a stone-poor alluvial environment. According to these models, the occupants of the Poverty Point site did not need agriculture due to the overabundance of wild food resources available in the rich riverine ecotone around Poverty Point. According to Jackson's Trade Fair model, Poverty Point was a meeting place for surrounding communities where they could trade information, mates, and stone (Jackson 1991a). Extant explanations regarding the socio-political structure at the Poverty Point site essentially fall into one of two explanatory models: the Great Town or the Vacant Ceremonial Center (Kidder et al. 2021b: 7-9). Propositions that support the Great Town model assert that a substantial residential community lived at Poverty Point and constructed the earthworks there continuously throughout the roughly 700-year occupation of the site. According to this model, Poverty Point was the outcome of mostly egalitarian foragers living in a superabundant environment (Crothers 2004: 94; Jackson 1991a; 1991b; Phillips 1970: 872; Willey 1957: 199). Those who support the Vacant Ceremonial Center model argue that the earthworks were built relatively rapidly by visiting groups that were politically and economically connected and perhaps subordinate to a group of elites residing at the site (Clark et al. 2010; Ford 1969: 191; Ford and Webb 1956: 128-130; Gibson 1974a, 1974b, 2007; Lauro and Lehmann 1982: 59-64; Lehmann 1982: 50-51; Saunders 2004: 157-160; Webb 1982: 13-14, 71-72; Williams and Brain 1983: 698-399, Figures 12.5, 12.6). Most but not all Vacant Center propositions assume some level of hierarchy, even if limited and situational, was a factor in the Poverty Point phenomenon. In a Vacant Ceremonial Center spin-off, Sassaman (2005, 2010) and Kidder and colleagues (2011, 2012; Kidder and Ervin 2018; Spivey et al. 2015) argue that the Poverty Point site was a multi-ethnic melting pot where disparate groups converged, perhaps as religious pilgrims, and pitched in to build many of the earthworks in a fairly short period of time. Finally, there are evolutionary perspectives that see the earthen monuments at Poverty Point, and related sites, as manifestations of biological imperatives such as costly signaling or forms of bet-hedging. The underlying theme that unites the evolutionary approaches is monumentality communicates the intentions of participants to transmit key information, cooperate, or share resources, ultimately increasing the biological fitness of all involved (Connolly 2017; Peacock and Rafferty 2013: 256-259; Quinn 2019; U.S. Department of the Interior 2013: Sidebar 2.12). The ambiguous chronology of earthwork construction at Poverty Point makes it difficult to resolve the different explanations for the site. Despite its large dataset of absolute dates, there are currently 80, the site chronology is still debated. Some argue that the earthworks were built gradually over a span of about 500 years (U.S. Department of the Interior 2013: 30; Gibson 2019: 52). Kidder argues that most construction was rapid (2011: 113).

1.2.3 Current State of Research Regarding the Poverty Point Phenomenon

Investigators have acknowledged that the Poverty Point culture concept is a gross simplification of a complex phenomenon (Gibson 2010: 77; 2019: 24; Kidder 2012: 461;

Grooms et al. 2022; Ward et al. 2022). However, the underlying logic still lingers and has led to a state of indeterminacy in Poverty Point phenomenon research. Most Poverty Point-affiliated sites were categorized as such during the 1950s to 1990s, relying mostly on the constellation of traits tabulated by Webb (1982), but the presence of nonlocal lithics and PPOs were treated as primary diagnostics. Very few of these sites have absolute dates, and those that do were processed decades ago when 14C dating techniques and sample collection methods were unacceptable by today's standards. Consequently, many sites are categorized as participants in the Poverty Point phenomenon, but the nature of the interactions that facilitated the exchange of ideas and cultural identity, manifest in similar material assemblages at different sites, is poorly understood (Gibson 1996: 305; Kidder 2012: 469; Spivey et al. 2015: 147-149; Grooms et al. 2022; Ward et al. 2022).

Consequently, the Poverty Point culture concept obscures complex regional histories by artificially flattening time and making it appear that innovations and cultural identity diffused from the Poverty Point site to the periphery (Gibson 1996: 305; Webb 1982). As a result, when a site in the LMV produces PPOs and nonlocal lithics, it is conceptualized as a participant in Poverty Point culture, or the more nebulous Poverty Point phenomenon, the latter usually understood to encompass the totality of social interactions related to the Poverty Point site and the diagnostic artifact complex with fewer of the culture-historical assumptions implied by the former. In the absence of absolute dates, it is often assumed that sites with Poverty Point-affiliated artifacts date to ca. 3600-3000 cal BP (the occupational span of the type site), and that the occupants received their cultural identity from Poverty Point. A few sites produce diagnostic artifacts and earlier than expected 14C dates (i.e., earlier than ca. 3600 cal BP), including Teoc Creek (Connaway et al. 1977) and Jaketown (Ford et al. 1955; Henry et al. 2017; Grooms et al.

2022; Kidder et al. 2018; Saunders and Allen 2003; Ward et al. 2022). These dates are either used to "push back" the Poverty Point period (e.g., from ca. 3600-3000 to ca. 4000-3000 cal BP) (Gibson 1996: 294), or it is assumed that the younger end of the probability distribution of an earlier than expected date (e.g., 4000-3600 cal BP) in fact, overlaps with the older end of the established chronology of the type site (e.g., 3600-3000 cal BP) and so is contemporaneous with the Poverty Point site after all (Gibson and Melancon 2004: 228). In either case, poorly resolved regional chronologies make it appear as though the Poverty Point site was an exporter of cultural identity to contemporary sites in the LMV. These assumptions are similar to those inherent in the Poverty Point culture concept that identified Poverty Point as the type site of an archaeological culture and as the source of Poverty Point identity. In this way, the typological framework of the Poverty Point culture concept remains a problematic heuristic crutch (Holland-Lulewicz 2021), substituting for absolute time and historical social interactions and obfuscating complex regional histories. Chronological control and an alternative theoretical framework are needed to sort out the history of the Late Archaic period (ca. 4800-3000 cal BP) in the LMV and the events related to the Poverty Point phenomenon (ca. 3600-3000 cal BP).

1.3 Moving Beyond Types and Categories to See History

Despite a long history of critique in archaeology (Feinman and Neitzel 2020, Henry *et al.* 2017; Holland-Lulewicz 2021; Howey & O'Shea 2009; Jones 2002: 106-110; Kosiba 2019; Lyman et al. 1997; 2004; 2013; MacEachern 2000; O'Brian and Dunnell 1998: 30; Pestle *et al*. 2013; Terrell *et al.* 1997; Wright 2017), typological or categorical logic remains embedded in many American regional histories. Typological entities, like the archaeological culture, were most useful during the mid-20th century when they were necessary substitutes for absolute time and material remnants of human history that were too ephemeral for archaeological methods of the time to detect. With the proliferation of archaeological methods and analytical technologies, these heuristics are obsolete; they hinder modern research by obscuring complex histories that require a scale of analysis beyond what is appropriate for the typological frameworks. Poverty Point research exemplifies the intersection of modern archaeology with inherited typological frameworks and the indeterminacy this situation creates as analysts try to untangle antiquated terms and models from incongruent data.

Most investigators agree that a geographically expansive Poverty Point culture probably did not exist. However, the Poverty Point site is still viewed as the source of a particular artifact complex and the cultural identity it represents, documented at presumably contemporary sites in the region. The precise nature of the interactions that resulted in the material similarities documented across the LMV remains debated. For example, it is unclear whether the Poverty Point site influenced visitors seeking exotic rock commerce or religious pilgrimage or if emissaries exported Poverty Point influence on visits to the periphery. Regardless of how analysts conceive of the particulars, the type site is still understood as a cultural core, the center of Poverty Point identity, that somehow reached contemporary sites in the region. Competing models of how innovations, ideas, and identity reached sites across the LMV beg questions about social organization at Poverty Point. There are no obvious indicators of hierarchy or centralized authority at any Poverty Point-affiliated site, so how did people organize themselves in a manner that facilitated the construction of the sprawling 200-ha earthwork complex at Poverty Point? Chronological control for the Poverty Point site and supposedly related ones is among the primary impediments to understanding the diachronic development of the period in the LMV collectively known as the Poverty Point phenomenon. Before we can build accurate accounts of what led to the creation of the Poverty Point site, we must establish chronological control for the site as well as historically antecedent and contemporary sites in the region that produce material assemblages like those found at the Poverty Point site.

I have argued that poorly resolved regional chronologies and the influence of antiquated theoretical frameworks are primary obstacles for investigators trying to break through the stagnant situation of Poverty Point phenomenon research. The normative assumptions inherent in regional histories of the Late Archaic LMV, which are heavily influenced by the culture-historians who initially created them, are enabled by a low-resolution chronology for Poverty Point and ostensibly related sites. The result is a regional history in which the Poverty Point site is considered the center and chief exporter of Poverty Point cultural identity and innovations (e.g., mound building, long-distance trade, etc.). The research presented in this dissertation is my attempt to contribute to Poverty Point scholarship by addressing these issues using Jaketown as a case study.

1.4 The structure of the dissertation

In this dissertation, I examine the historical processes that led to the Poverty Point phenomenon and the role of mound building during this important era of Native American history. To do this, I conducted four research expeditions at the Jaketown site in west-central Mississippi. I structure my research questions around the following themes:

1. Rather than fit the data from Jaketown into extant regional histories that assume shared cultural identity between typologically similar sites, I focus on the variation (i.e., differences in chronology, material assemblage, architecture, mound building techniques, and exchange networks) between Jaketown and the Poverty Point site. How are these differences instructive in our attempt to understand the Poverty Point phenomenon?

2. The culture-history paradigm still influences how we explain the Poverty Point phenomenon. Extant regional histories of the Late Archaic period (ca. 5000-3000 cal BP) Eastern Woodlands share a foundational assumption: the Poverty Point site was a center of innovation that exported cultural identity outward to presumably contemporary sites in the region. Do the data from Jaketown, a supposed regional center of the Poverty Point culture, support this assumption?

3. How can archaeologists move beyond antiquated typological frameworks that obscure complex histories and result in archaeological narratives that many Native Americans today find turgid and irrelevant? Furthermore, how can we create accounts of the past that reflect the humanity of the ancestors of modern American Indians while remaining methodologically and intellectually rigorous?

Chapter 2: *The View from Jaketown: Considering Variation in the Poverty Point Culture of the Lower Mississippi Valley* addresses theme number one. My co-authors (Grace M.V. Ward, Andrew G. Schroll, and Tristram R. Kidder) and I addressed the effects of the culture-history paradigm on regional histories pertaining to the Poverty Point phenomenon. As an alternative, we present a framework focused on variation in material culture, architecture, and foodways between Jaketown and the Poverty Point site. This article is primarily based on findings from our excavations at the Jaketown site in 2018 and 2019. During those two field seasons, Grace Ward contributed her paleoethnobotanical expertise, which included identifying, collecting, and processing ancient botanical samples using a SMAP-style flotation instrument. Ward's paleoethnobotanical data shed light on foodways employed at Jaketown and allowed for AMS 14C dating on short-lived plant species. Andrew Schroll contributed technical assistance during the 2018 and 2019 field seasons, especially regarding lithic and stone tool data. I contributed geoarchaeological perspectives in the field, such as describing stratigraphy, discerning cultural and natural strata, and identifying ideal stratigraphic contexts for sampling. As lead author, Ward wrote most of the text while I wrote sections pertaining to 14C dating and chronological modeling. I also assisted in the conceptualization of the article as a whole and in replying to edits during the peer review process. As director of the Geoarchaeology Laboratory at Washington University in St. Louis, Tristram Kidder oversaw fieldwork and data analyses, contributed to the conceptualization of the article, and provided edits and feedback throughout the writing process. This paper was published by *American Antiquity* in 2022.

Chapter 3: *Is There a Poverty Point Culture? Revising the History of the Late Archaic Lower Mississippi Valley, USA,* addresses themes one and two. My co-authors and I (Grace M.V. Ward and Tristram R. Kidder) present a detailed chronological model of occupation at Jaketown. The model relies on Bayesian statistical analyses incorporating 26 AMS 14C dates and allows us to discern four phases of site occupation (initial, intensive, earthwork construction, and post-flooding) with accompanying time spans. This article demonstrates that certain practices, such as the use of diagnostic artifacts and mound building, once thought to signal influence from the Poverty Point site and participation in the Poverty Point culture, occurred first at Jaketown. These findings contradict extant regional histories that situate Jaketown as a peripheral expression of the Poverty Point culture and the Poverty Point site as an exporter of cultural identity. Using the revised chronology of Jaketown as a case study, we argue that typological and categorical frameworks, especially the uncritical use of radial diffusion as a causal mechanism, continue to obscure complex regional histories. As lead author, I wrote the text and conducted the chronological modeling. Co-author Grace Ward's paleoethnobotanical data were critical in providing short-lived carbon samples for AMS dating, which improved the quality of the chronological model. Both co-authors Ward and Kidder helped conceptualize the paper as a whole and provided substantial edits. This paper is currently under review for submission to *Antiquity*.

Chapter 4: *Sacred Ballast on a Volatile Landscape: Mound Building as Performance in the 4th Millennium B.P. Lower Mississippi Valley* addresses themes 1-3. Building on scholarship that has documented environmental degradation throughout the LMV during the mid to late fourth millennium BP, this article addresses the cultural response to environmental instability at Jaketown. In this article, I rely on common themes found in Native American philosophies and epistemologies as a theoretical framework. Drawing on insights from American Indian scholars, I reinterpret the history of mound building at Jaketown as a communal performance to restore balance to relations in flux. Moreover, I demonstrate that we can access performance in archaeological data. This work shows that archaeologists can interpret archaeological data derived from modern methods (e.g., AMS 14C dating, artifact analyses, chronological modeling, stratigraphic analyses, magnetic susceptibility analyses, and micromorphology) within a theoretical framework comprised of insights from the descendants of those who created the archaeological record we study. Such interpretations are empirically sound because they are more likely to be a faithful reflection of the basic worldviews of Indigenous people of the past compared to those derived from Western social theory alone. I am responsible for the data analysis and writing in this paper, except for the micromorphological analysis, which was done by my colleague Su Kai at Washington University in St. Louis.

All data produced as a result of this dissertation will be stored in two places. All digital data will be curated in the digital repository of the Washington University in St. Louis Library system. All artifacts, original notes, and maps will be stored at the Appalachian State University Landscape Archaeology Laboratory in North Carolina.

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Chapter 2:

The View from Jaketown: Considering Variation in the Poverty Point Culture of the Lower Mississippi Valley

Grace M. V. Ward, Seth B. Grooms, Andrew G. Schroll, and Tristram R. Kidder

2.1 Abstract

Recent research at Jaketown, a Late Archaic earthwork site in the Lower Mississippi Valley, suggests that the culture-historical framework used to interpret Jaketown and contemporary sites in the region obscures differences in practices across sites. As an alternative, we propose a framework focused on variation in material culture, architecture, and foodways between Jaketown and Poverty Point, the regional type site. Our analysis indicates that people used Poverty Point Objects and imported lithics at Jaketown by 4525–4100 cal BP—earlier than elsewhere in the region. By 3450–3350 cal BP, people intensively occupied Jaketown, harvesting a consistent suite of wild plants. Between 3445 and 3270 cal BP, prior to the apex of earthwork construction at Poverty Point, the community at Jaketown built at least two earthworks and multiple post structures before catastrophic flooding sometime after 3300 cal BP buried the Late Archaic landscape under alluvium. These new data lead us to conclude that the archaeological record of the Late Archaic Lower Mississippi Valley does not reflect a uniform regional culture. Rather, relationships between Jaketown and Poverty Point indicate a multipolar history in which communities selectively participated in larger social phenomena—such as exchange networks and architectural traditions—while maintaining diverse, localized practices.

2.2 Introduction

This article presents the results of recent research at Jaketown (22HU505), a Native American earthwork site in the Lower Yazoo Basin of west-central Mississippi (Figure 2.1). Evidence from Jaketown comprises a significant part of the material record attributed to the Poverty Point culture. As a culture-historical unit, Poverty Point is used to describe groups living in the Lower Mississippi Valley during the Late Archaic period (ca. 5800–3000 BP; Byrd 1991; Ford and Webb 1956; Gibson 2000; Jackson 1989, 1991; Kidder 2012; Lehmann 1991; Phillips 1970; Phillips et al. 1951; Sassaman 2005; Sassaman and Brooks 2017; Webb 1968, 1982). The culture is named after the Poverty Point site (16WC5), a landscape of earthen mounds, ridges, and other features covering over 5 km of Macon Ridge in the Upper Tensas Basin of Louisiana, approximately 100 km southwest of Jaketown. Unique for its region and period, the Poverty Point site has attracted considerable anthropological attention as a perceived contradiction of once-orthodox models of cultural evolution. Living in a subtropical alluvial environment, the people of Poverty Point maintained social structures responsible for complex architecture and exchange systems unrivaled in scale and elaboration for millennia in eastern North America. According to available data, they did so without domesticate-based agriculture or institutionalized social hierarchy (Gibson 2007; Jackson 1989; Kidder 2011; Ward 1998).

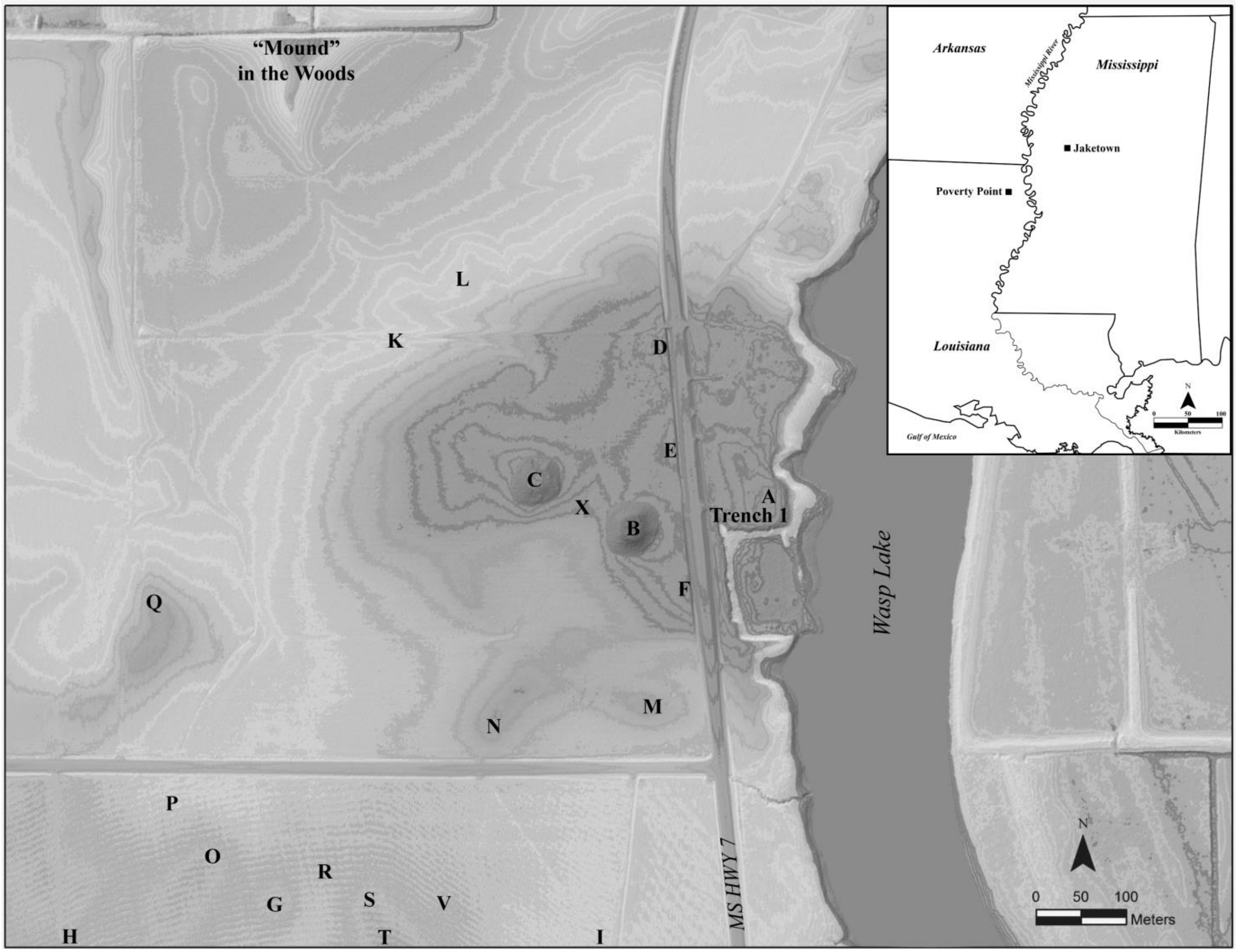

Figure 2.1 Map of the Jaketown site, with locations of mounds (A, B, C, D, E, F, G, H, I, P, Q, S, V, and X), artifact scatters (K, L, M, N, O, R, and T), and other areas discussed in the text. Inset map of the Lower Mississippi Valley of the southeastern United States, with the locations of the Jaketown and Poverty Point sites. (Base map courtesy of Kelly Ervin.)

To understand the sociopolitical processes responsible for Poverty Point, archaeologists have turned to contemporary sites in the Lower Mississippi Valley and identified variation in chronology, material culture, and degree of landscape modification (Ford et al. 1955; Phillips et al. 1951; Sassaman and Brooks 2017; Saunders and Allen 2003; Webb 1968, 1982). Jaketown is the largest of these contemporary sites. Drawing on recently recovered data, we suggest that variation in chronology and cultural practices between Poverty Point and Jaketown offers a stereoscopic view of social change in the Lower Mississippi Valley. As remains of shared practices, elements of "Poverty Point culture" exist at both places. But only in abstract do these elements come to represent the defined set of practices or shared system of social organization implied by culture-historical frameworks.

Our empirical findings at Jaketown support a broader methodological position: the multiscalar nature of social organization in the Late Archaic Lower Mississippi Valley—characterized by extensive social networks and diverse localized practices—demands closer attention to geographically dispersed and temporally staggered dynamics of social change. At Jaketown, we identify these dynamics in the following sequence of events. First, people came to the naturally elevated ridges of a point bar along an inactive channel of the Mississippi River at Jaketown around 4525–4100 cal BP (95.4% confidence interval; Table 2.1) and left behind distinctive clay artifacts known as Poverty Point Objects (PPOs), lithic debitage from nonlocal sources, and food remains. Second, around 3450–3350 cal BP (95.4% confidence interval), well after initial use, people intensively occupied the site, participated in lithic exchange networks, and engaged in patterns of wild-plant harvesting, processing, and consumption distinct from those observed at contemporary sites.

Table 2.1 Radiocarbon Dates from Jaketown.

Lab Number	Context	Radiocarbon Age (yr BP)[a]	$\delta^{13}C$	2σ (cal yr BP)[b]	Probablity under Distribution (%)	2σ Date Range (cal yr BP)	Calibrated Median (cal yr BP)	Material
UGA-38993	Mound A surface directly below alluvium	3110±20	-25.94	3385–3320 3305–3245	55.6 39.8	3385–3245	3335	Seed (*Diospyros virginiana*)
UGA-38992	Mound A organically and culturally enriched fill (upper)	3150±20	-25.48	3445–3420 3415–3335 3285–3270	11.2 81.3 2.9	3445–3270	3375	Seed (*Diospyros virginiana*)
UGA-38991	Mound A organically and culturally enriched fill (lower)	3150±20	-25.33	3445–3420 3415–3335 3285–3270	11.2 81.3 2.9	3445–3270	3375	Seed (*Diospyros virginiana*)
OS-160358[c]	Trench 1 midden (upper)	3160±20		3450–3350	95.4	3450–3350	3385	Nutshell (*Carya* sp.)
OS-151671	Sub–Mound X surface directly below mound fill	3170±20		3450–3360	95.4	3450–3360	3395	Seed (*Diospyros virginiana*)
OS-159306	Trench 1 midden (lower)	3190±20		3450–3370	95.4	3450–3370	3410	Nutshell (*Carya* sp.)
UGA-41848	PPO concentration in sub–Mound X deposits	3200±25	-24.05	3455–3370	95.4	3455–3370	3415	Nutshell (*Carya* sp.)
Beta-555137	Steatite sherd from Mound X organically and culturally enriched fill	3260±30	-25.20	3565–3440 3435–3395	81.6 13.8	3565–3395	3470	Organic residue on steatite vessel sherd
UGA-41847	Sub–Mound A pit; associated with biconical PPO	3910±70	-23.39	4525–4145 4115–4100	94.9 0.6	4525–4100	4335	Seed (*Diospyros virginiana*)

aRadiocarbon dates are reported as Radiocarbon Years Before Present and calculated using the Libby 14C half-life (5,568 years).
bDates calibrated using OxCal v4.4 (Bronk Ramsey 2020) using the IntCal20 data set (Reimer et al. 2020).
cRadiocarbon results from Woods Hole NOSAMS were corrected for isotopic fractionation using unreported δ13C values measured on the accelerator.

Third, the community at Jaketown constructed extensive earthworks and post structures around 3445–3270 cal BP (95.4% confidence interval), before the apex of construction at Poverty Point. Fourth, catastrophic flooding caused by shifts in the course of the Mississippi River sometime between approximately 3300 cal BP and roughly 2780 cal BP buried most of the built landscape under alluvium (Kidder 2006; Kidder et al. 2018: Table 1) and ended Late Archaic use of the site. These site-level findings depict the history of Late Archaic Jaketown as an amalgamation of continued practice and novel events occurring over a long period of time. They support neither the adoption of a unified suite of traits particular to the Poverty Point site nor a historical trajectory aligned with a homogenous regional chronology.

2.3 Defining Poverty Point: A Unified Culture?

Historically, archaeologists have described Poverty Point as a unified culture with its origins at the Poverty Point site (Byrd 1991; Ford et al.1955; Gibson 2000:268–274, 2007; Haag and Webb 1953; Jackson 1991; Lehmann 1982; Webb 1968). Following the conventions of culture history, sites are classified as "Poverty Point sites" based on evidence for one or more characteristic traits. These include the presence of PPOs, assemblages of lithic material imported from other regions, and, less often, earthworks (Ford and Webb 1956; Webb 1968, 1982; Williams and Brain 1983). A close reading of available data, however, imparts a different view. It is difficult to discern a temporally and geographically distinct, technologically uniform culture—or set of material practices, social structures, and worldviews that distinguishes one group of people from another—in the archaeological record of the Late Archaic Lower Mississippi Valley. Poverty Point–associated traits are widely distributed (Webb 1968, 1982:5–9), and we know little about the temporal relationships between most sites. Sites vary significantly in size (Webb 1982:9), and earthworks are present at only a small fraction (Gibson

2010:80). Not all Poverty Point sites share all (or even many) of the settlement or material characteristics of the type community (Webb 1982: Table 18). Some traits used to define Poverty Point culture have considerable temporal duration and, for this reason, are not relevant to reconstructing short-term dynamics of social change. This is especially true of PPOs, which are similar to artifacts used in preceding and subsequent periods in the region and beyond (Ford et al. 1955:52–53; Henry et al. 2017; Saunders et al. 1998). Taking all of this into consideration, we conclude that assemblages of PPOs, nonlocal lithics, earthworks, and other traits do not form a strong basis for building a regional typology. Instead, these features are most analytically useful when understood as archaeological manifestations of contingent events nested within larger historical processes.

This observation is informed by two sources: studies of hunter-gatherer sociopolitical variability and relational taxonomies derived from Native American philosophy. Regarding the former, culture-historical units implicitly assume a degree of geographical uniformity and temporal continuity. This in turn obscures a key feature of many hunter-gatherer societies: social structures that vary along lines of hierarchy and group size according to seasonal as well as episodic dynamics of production, settlement, and exchange (Wengrow and Graeber 2015). We identify comparable variation in aspects of Poverty Point culture as described above: smaller sites with fewer diagnostic traits contrast with large sites of aggregation and more codified practice. This poorly understood social pattern likely formed in dialogue with ecological systems and is therefore analytically linked to notions of place and human–nonhuman relatedness embodied in Native monumental landscapes across the Southeast (Bloch 2019, 2020; Howe 2014; Sanger 2021). Culture-historical frameworks cannot help us understand what they are not designed to see, whether that be radically flexible social structures or—following Zedeño (2009)—permeable boundaries between humans and nonhumans.

To escape the implicit assumptions and blind spots of culture history, Feinman and Neitzel (2020:9) recommend that archaeologists describe sites and artifacts according to "the presence/absence or frequency of specific features…accompanied by available absolute date ranges rather than period or phase distinctions." Accordingly, rather than the greatest concentrations of traits used to define Poverty Point culture, we describe Poverty Point and Jaketown as the first and second largest sites (by spatial extent) in the Lower Mississippi Valley between approximately 5800 and 3000 BP. Our data indicate significant variation in the presence, absence, and frequency of certain features, including forms of architecture, material culture, and emphasis on particular plants. We suggest that focusing on this variation opens new analytical pathways by which to understand processes of social and environmental change.

2.4 The Jaketown Site: Description and Previous Research

The Jaketown site occupies more than 80 ha of a relict Mississippi River point bar adjacent to an oxbow known as Wasp Lake. Material culture from the Middle Archaic (8000–5800 BP) through the historic era is present, but the Late Archaic component comprises the most intensive occupation based on volume and spatial extent of associated artifact scatters, earthworks, and midden (Ford et al. 1955:104; Haag and Webb 1953; Lehmann 1982:5; Phillips 1970:404). When Jaketown was first surveyed in the 1940s, Phillips recorded six earthen mounds, labeled A–F (Phillips et al. 1951: Figure 43). Of these, only Mounds B and C are prominent on the landscape today. A paleochannel of the Stage 3 Mississippi River arcs across the site west of Mounds B, C, D, and E (Ford et al. 1955: 18–24; Saucier 1994). Roughly 500 m to the southwest of Mound B on a levee forming the western edge of the relict channel, Ford and colleagues (1955) located at least seven low, dome-shaped mounds during extensive survey and excavations in 1951. The largest of these, Mound G, was partially excavated and determined to be anthropogenic based on the presence of material culture and features. No radiocarbon samples were collected, but the material culture assemblage was very similar to that of the Poverty Point site, lacking ceramics but dominated by PPOs and nonlocal lithic tools and debitage (Ford et al. 1955: 36–37). Ford and colleagues classified an additional series of low rises and artifact scatters along the levee as “locations” (Ford et al. 1955: Plate 1). None of the levee mounds or locations are distinct on the landscape today. Artifact assemblages similar to the Mound G assemblage—PPOs, lithic tools, debitage, Late Archaic projectile points, and very few ceramics—were recovered from the surface of the whole area of the levee mound and location group (Lehmann 1982). Across the paleochannel to the northwest of Mound C, Ford and colleagues (1955: Figure 5) identified and mapped a Y-shaped earthen rise. Labeled “Mound in the Woods,” the feature has been significantly altered by modern ditch digging and the construction of a large pond, but it is still clearly visible.

Following these initial investigations, researchers returned to Jaketown to conduct analyses of privately held surface collections and obtain radiocarbon dates from core samples (Lehmann 1982; Saunders and Allen 2003). Despite this work, a lack of reliable chronometric data and differing stratigraphic analyses led to multiple equivocal interpretations of the cultural, ecological, and geomorphologic history of the site (Ford et al. 1955:104–117; Phillips 1970:528; Saunders and Allen 2003:162–163; Williams and Brain 1983:354).

2.5 Methods

This report is based on the findings of several seasons of fieldwork conducted at Jaketown from 2007 to 2009 and from 2018 to 2020. Our research objectives were to (1) determine the geomorphology and paleoecology of the Late Archaic component; (2) gather new data to establish a secure chronology and better understanding of stratigraphic sequences, especially of the Late Archaic earthworks; and (3) recover and document paleoethnobotanical samples. Sediment coring conducted at the site in 2009 identified a deeply buried Late Archaic deposit between Mounds B and C. Following coring, a team from Washington University in St. Louis and Murray State University excavated a 2 x 2 m unit into the deposit and identified it as an earthwork, labeled Mound X. An additional 1 x 2 m unit was placed immediately south of Mound A, and a stepped 4 x 1 m unit was placed in a drainage cut bisecting Mound in the Woods. The rest of our data were recovered by reopening extensive trenches that Ford and colleagues excavated in 1951.

We used multiple field and laboratory methods to build a holistic dataset. Field analysis included standard stratigraphic description, systematized soil sampling, and artifact recovery by screen (1/4-in. mesh) and hand excavation. We collected carbonized seeds and nutshell from contexts of interest for radiocarbon dating. We calibrated our results using OxCal v4.4 (Bronk Ramsey 2020) and the IntCal20 calibration curve (Reimer et al. 2020). Column samples collected from excavation units were analyzed in the Geoarchaeology Laboratory at Washington University in St. Louis, and they were subject to particle-size analysis, magnetic susceptibility, and micromorphological analysis of sediment thin sections. We collected flotation samples systematically by context during new excavations and from earthwork and midden contexts identified in exposed profiles in reexcavations. Samples were processed in a modified SMAP-style flotation tank. Heavy and light fractions were both recovered to 0.425 mm. Macrobotanical analysis was conducted in the Paleoethnobotany Laboratory at Washington University in St. Louis.

We chose to reexcavate rather than open new units in 2018 and 2019 in consideration of both the significant depth below ground surface of the Poverty Point component (roughly 3.5 m in parts of the site) and the persistent cultural significance of Jaketown. Regarding the latter, we prioritized the preservation of Jaketown's remaining earthworks in light of Native American critiques of archaeological practice (e.g., Atalay 2006; Wilson 2008). Furthermore, previous excavators encountered numerous burials at Jaketown, likely associated with the late precontact- and historic-era components (Ford et al. 1955: 32). New extensive excavations would potentially disturb any burials remaining at the site. We recommend this strategy of reexcavation to other researchers working in culturally significant landscapes with histories of prior archaeological excavation.

2.6 Late Archaic Jaketown

2.6.1 Paleotopography and Ecology

The paleotopography of Late Archaic Jaketown is largely obscured by subsequent alluviation. Core data confirm the Mississippi River paleochannel in the western portion of the site documented by Ford and colleagues (1955: 18–24) and show that at least four natural swales and five sandy point-bar ridges underlie the modern surface of Jaketown. Some sections of the point bar ridges show evidence of an A horizon forming before initial cultural deposits, indicating that the sandy surfaces of the point bars were covered in vegetation before people used them.

Although some Middle Archaic material culture is present at Jaketown (Lehmann 1982), there is no evidence of extensive site use prior to the Late Archaic. Researchers have offered various hypotheses regarding the interface of the point bars and initial Late Archaic cultural strata. Ford and colleagues (1955: 33; Figure 9) observed a sequence of stratified deposits containing PPOs, lithic debitage, and charcoal interleaved with clean loamy sediments overlying the point bar in a trench excavated into Mound A. Ford interpreted the loamy sediments as natural alluvial deposits, suggesting that the Stage 3 Mississippi River channel immediately east of the site—which became Wasp Lake—was active when people using Poverty Point–associated material culture first occupied Jaketown. Following Ford, the stratified deposits were interpreted as temporary encampments left behind by mobile hunter-gatherer groups who came and went according to the state of the river (Connaway et al. 1977: 91–93; Ford et al. 1955: 22).

Phillips (1970: 527–529) later hypothesized that these loamy sediments were in fact cultural deposits associated with the construction of an earthwork. Our research corroborates this interpretation (discussed below). The cultural origin of the loamy sediments and lack of active levee building or other significant sedimentation indicates that the Stage 3 channel was most likely only a small underfit stream during the Late Archaic occupation. A recently formed oxbow lake was located west of the site, fostering a range of aquatic species. In this respect, Jaketown resembles the majority of other Late Archaic sites in the region, also located along the geomorphologically stable and resource-rich backwaters of the Mississippi River floodplain (Jackson 1989; Webb 1982).

2.6.2 Early Site Use

A pit cut directly into the point bar beneath Mound A represents the first known use of the site by people during the Late Archaic. A persimmon (*Diospyros virginiana*) seed recovered from the pit dates to 4525–4100 cal years BP (95.4% confidence interval). The sample was directly associated with a biconical PPO (Figure 2.2), fragments of baked clay, small pieces of unidentified fish and mammal bone, and what appears to be processed fruit pulp—likely persimmon. Lithic fragments were also recovered from the pit fill, including microflakes of novaculite (likely sourced from west-central Arkansas; Gibson 1994; Lehmann 1991). A flotation sample from the pit contained fragments of persimmon seeds, acorn (*Quercus* sp.) and hickory (*Carya* sp.) nutshell, and a small number of chenopod (*Chenopodium* sp.) seeds.

The presence of a biconical PPO and nonlocal lithic material in this early context is notable. Baked clay objects of varying morphologies were used during the Middle Archaic west of the Mississippi (Hays et al. 2016; Saunders et al. 1998; Webb 1982), but biconical clay objects are one of the common morphologies identified in large numbers at Poverty Point and during later phases at Jaketown (Ford et al. 1955: Table 2; Webb 1982: Table 4). For the purposes of our study, we emphasize that PPOs found in combination with nonlocal lithics are among the most common traits used by researchers to identify Poverty Point–associated sites (Gibson 2007; Webb 1982). As cooking tools, PPOs indicate a particular culinary practice with deep and varied roots (Hays et al. 2016; Saunders et al. 1998), whereas nonlocal lithics indicate long-distance social relationships (Gibson 1994; Jackson 1991; Sassaman 2005). Taken together, these artifacts suggest that the people who left behind this early pit were already familiar with practices that came to characterize life at both Jaketown and Poverty Point during later periods. Micromorphological analysis indicates that an incipient A horizon developed over the pit after it was filled in. For this horizon to form, the landscape must have been stable and undisturbed—at

Figure 2.2 Biconical PPO collected from pit dug into point bar beneath Mound A.

least in this area of the site—for an extended period of time after the infilling of the pit and before the construction of Mound A began around 3445 cal BP.

2.6.3 *Intensive Occupation and Earthwork Construction*

People intensively occupied Jaketown from roughly 3450 to 3350 cal BP (95.4% confidence interval), leaving behind midden and sequences of post molds near the western bank of Wasp Lake. This community harvested the same plants as the group represented by the early pit described above—again, acorn, hickory, and persimmon were the dominant taxa identified in flotation samples taken from midden contexts. When Ford's team first encountered the midden, they noted organically rich deposits containing Poverty Point material culture and post molds—including a sequence in a circular formation—beneath what they described as a stratum of natural levee sediments (1955:31: Figure 8). When our team reopened this context for geoarchaeological and paleoethnobotanical sampling in 2019, we encountered two layers of midden and a sequence of four evenly spaced post molds 20–30 cm in diameter and roughly 50 cm apart (Figure 2.3). Based on nearly identical dimensions and stratigraphy, we interpret these post molds as part of the circular formation noted by Ford. We also observed many smaller post molds in our 1 x 2 m unit abutting Ford's original excavations, but we could discern no configurations (Figure 2.4).

In addition to Mound G as described by Ford and colleagues (1955:36–37), our research identifies Mounds A and X as Late Archaic earthworks, likely built simultaneously or in short succession between 3445 and 3270 cal BP (95.4% confidence interval). People constructed both earthworks by layering organically and culturally enriched sediments and silty clays, resulting in distinct stratiform deposits (Figures 2.5 and 2.6). The layers of enriched fill contain a mixture of

PPOs, lithic debris, acorn, hickory nutshell, and persimmon and chenopod seeds, resembling the composition of samples from the early pit beneath Mound A and the midden along Wasp Lake. We collected diagnostic Poverty Point–associated material culture from the enriched fill in Mound X, including a Pontchartrain point and steatite vessel fragment. We observed no occupation surfaces, significant weathering, or natural soil formation between layers of construction fill in either earthwork, indicating that builders worked relatively rapidly, leaving no layers exposed for long.

Figure 2.3 North profile of Trench 1: (a) natural point bar, (b) midden, (c) silty clay, (d) post molds, and (e) alluvium.

Figure 2.4 Floor of excavation unit adjacent to Trench 1 showing post molds in point bar beneath Poverty Point–era midden.

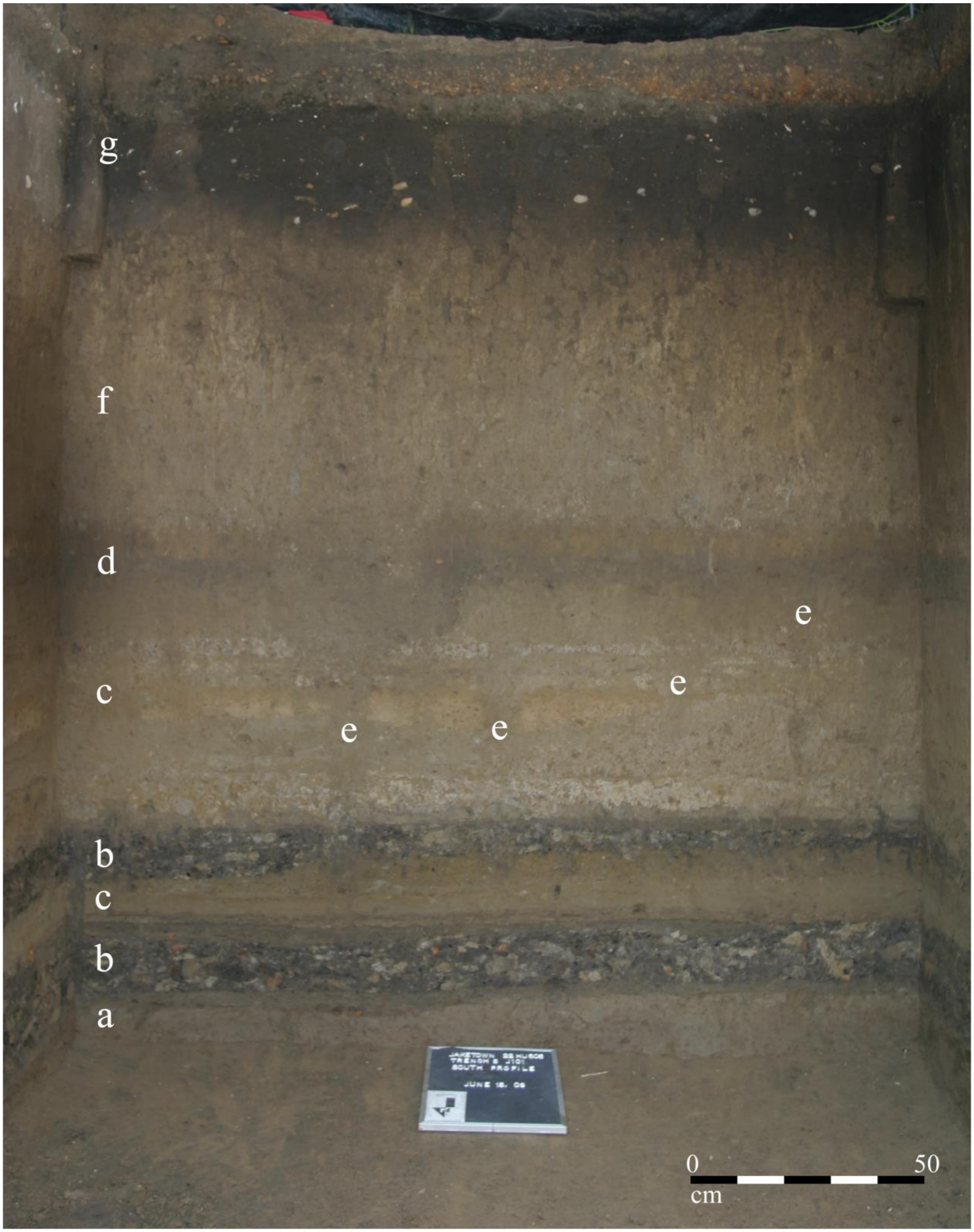

Figure 2.5 South profile of excavation unit in Mound A: (a) natural point bar, (b) organically and culturally enriched fill, (c) silty clay fill, (d) earthwork surface, (e) post molds, (f) alluvium, and (g) late precontact midden.

Figure 2.6 East profile of excavation unit in Mound X: (a) submound surfaces, (b) clay fill, (c) organically and culturally enriched fill, (d) silty clay fill, (e) earthwork surface, and (f) alluvium.

Successive surfaces directly underlying Mound X represent at least two events resulting in a rich mixture of plant and animal remains and PPOs. These surfaces included multiple concentrations of PPOs and an intact combustion feature. We also observed an assemblage of mammalian long bones (likely deer) oriented in a manner that suggests deposition in a single event (Figure 2.7). Flotation samples from the PPO concentrations contain persimmon, hickory, acorn, and chenopod. Due to massive rainfall shortly after we uncovered the deposits, we were unable to collect faunal material beyond small fragments and unidentified fish bones captured in flotation samples. Micromorphological analysis of the interface of the surfaces and initial layer of mound fill shows no evidence of weathering, which means that deposition events occurred in quick succession. To our knowledge, there are no comparable deposits directly underlying a Late Archaic earthwork described elsewhere in the Lower Mississippi Valley, although the deposits do resemble submound floors observed at the Middle Archaic Frenchman's Bend site in northeast Louisiana (Saunders 2004:152–153). At Jaketown, we interpret these layers as the remains of communal gathering and feasting activities associated with the subsequent construction of Mound X. We discuss this interpretation in more detail below.

Although we cannot unequivocally interpret how Mounds A and X were used once completed, we do have evidence of some events occurring after or toward the end of construction. An area of red hardened earth with high magnetic susceptibility values near the top of Mound A indicates that a fire was built on the surface at some point, although we found no associated charcoal. People inserted posts into both mounds during or after construction. Post molds roughly 60 cm in diameter—the largest observed at Jaketown—were placed in Mound X, originating at the surface and extending down through multiple layers of fill (Figure 2.8). Ford and colleagues (1955:34: Figure 10) noted small post molds originating within and running

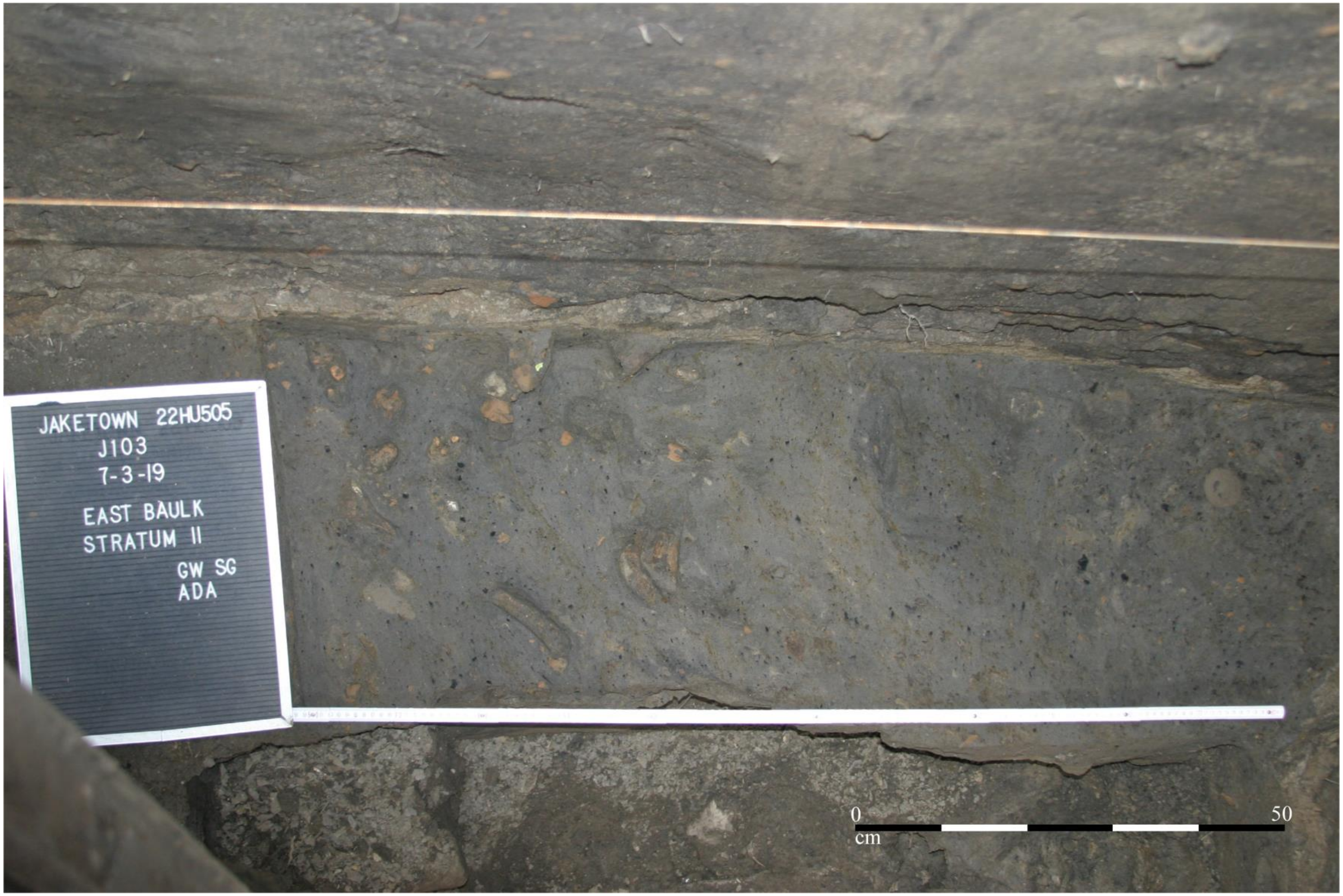

Figure 2.7 Sub–Mound X surface with animal bones, PPOs, and charred plant remains.

Figure 2.8 North profile of excavation unit in Mound X: (a and b) two adjacent post molds running through (c) organically and culturally enriched fill and (d) silty clay fill.

through layers of fill in Mound A, forming a curvilinear outline in one instance. These posts appear to be considerably smaller than the posts in the circular formation associated with the midden by Wasp Lake described above.

2.6.4 Other Aspects of the Poverty Point–Era Landscape

The low mounds and locations observed by Phillips (1951) and Ford and colleagues (1955) along the western edge of the site have not been radiocarbon dated, making it difficult to associate these areas with the activities at Mounds A and X and along Wasp Lake, although most of the material culture recovered from the areas was Late Archaic. Similarly, although Mound G is definitively considered a Late Archaic earthwork, the lack of absolute dating prevents us from including it in a refined site chronology. The role of Mound in the Woods during the Late Archaic occupation also remains ambiguous. Coring and excavations conducted in 2020 suggest that the rise is a remnant of a larger natural feature serendipitously protected from alluvial erosion. However, we posit that Poverty Point–era people incorporated Mound in the Woods into the cultural landscape at Jaketown. Evidence for such use include its prominence (it is the highest natural feature in the immediate area) and the density of Poverty Point material culture on the “mound” surface observed in recent surveys.

2.6.5 Flooding

Sometime after 3300 cal BP, global climate change caused increased precipitation over the North American midcontinent. The Mississippi River accommodated the resulting higher flow by shifting course, moving from Stage 2 to Stage 1 of the Mississippi River system (Kidder 2006; Kidder et al. 2008; Saucier 1994). At Jaketown, and across much of the Lower Mississippi Valley, this stage shift caused catastrophic flooding. The higher flow inundated the backwater channel that is now Wasp Lake, breaching the levee just north of Mound A and flooding much of the site. The Late Archaic landscape—including Mounds A and X—was buried under alluvium (Kidder et al. 2018). This period represents a large-scale reordering of life throughout the Mississippi Valley (Kidder 2006).

2.7 Defining Poverty Point: The View from Jaketown

Informed by our interpretation of events at Jaketown between roughly 4500 and 3300 cal BP, we return to the nature of the relationship between Jaketown and the Poverty Point site and the analytic utility of Poverty Point as an archaeological culture. Considering both chronology and significant similarities in material culture, we are confident that the communities at Jaketown knew of and—considering hunter-gatherer sociopolitical variability—perhaps partially comprised the communities responsible for building Poverty Point. We follow Sassaman's (2005) analysis of the social geography of Poverty Point as corporate and pluralistic, and Spivey and colleagues' (2015) interpretation of Poverty Point as a place of pilgrimage to situate Jaketown as an associated site of both localized and integrative practice. Accordingly, people at Jaketown inhabited and constructed the local environment, social history, and cultural meaning of the site while simultaneously participating in the social phenomena responsible for the earthworks at Poverty Point. Comparisons of evidence for exchange, aggregation, architectural innovation, and specialized plant use clarify the significance of intersite variability for understanding social developments in the Late Archaic Lower Mississippi Valley.

2.7.1 Artifacts of Exchange and Aggregation

The biconical PPO and nonlocal lithics left behind in the pit beneath Mound A at Jaketown are currently the earliest manifestations of traits used to define Poverty Point culture.

They appeared at Jaketown nearly 500 years before the substantial use of similar artifacts at Poverty Point. In later phases, however, artifact assemblages from Jaketown and Poverty Point are qualitatively similar, sharing many stylistic and functional features (Webb 1982:70–71). People at both sites crafted characteristic multiform PPOs and maintained a distinctive microlithic and lapidary industry focused on the production of blades, drills, and beads from mostly nonlocal raw material. The quantity and array of nonlocal material present early at Jaketown—including novaculite and steatite (sourced from the Southern Appalachians)—indicate that the Late Archaic community was engaged in nonlocal exchange networks before the apex of activity at Poverty Point (Johnson 1993; Lehmann 1991).

As stated above, the organically rich surfaces under Mound X may represent communal feasting, perhaps held in the fall given the predominance of persimmon (ripe from September to November across much of the Southeast today). The density of food remains observed and "eventfulness" of the deposition under Mound X are consistent with archaeological signatures of feasting (Kassabaum 2019; Peres 2017; Twiss 2012). This event or events could be related to the gatherings described as a potential driver of the construction of Poverty Point (Hays 2018; Spivey et al. 2015) or might represent a distinct practice. We need more data to draw further conclusions, but the similarity of the sub–Mound X feasting deposit to assemblages of food remains and material culture from earlier contexts at the site suggest sustained, localized foodways focused on group food processing and shared meals.

2.7.2 Architecture

Although we do not know the full extent or form of the earthworks at Jaketown, geoarchaeological data discussed above demonstrate that both Mounds A and X were constructed rapidly, comparable to the construction of Mound A and the ridges at Poverty Point (Kidder et al. 2021; Ortmann and Kidder 2013). This suggests similar methods of construction at the two sites, at least in terms of the pace of labor. Whereas a number of construction methods are evident at Poverty Point (Kidder et al. 2004; Ortmann and Kidder 2013), at Jaketown so far we have evidence for only the stratified method used to build Mounds A and X. The association between posts and earthworks is a potentially more significant point of architectural variation between the two sites. The large posts erected during or after the construction of Mounds A and X are similar to those observed in the plaza of Poverty Point, but there is no evidence of posts being placed in earthworks at a similar scale at Poverty Point (Hargrave et al. 2021; Kidder et al. 2021; Ortmann and Kidder 2013). This suggests shared (although not identical) architectural practices in terms of form and ultimate function. The use of posts at both sites may be temporally differentiated, although we cannot say this conclusively. The post circles at Poverty Point were in use during early and peak phases of earthwork construction at Poverty Point (Hargrave et al. 2021). The posts at Jaketown are in diverse contexts that span at least the period of earthwork construction. Without more chronometric data from both sites, we cannot prove or disprove that the post circles at Poverty Point were contemporaneous with the posts at Jaketown. Although the generally earlier chronology at Jaketown suggests that the community there might have built post circles before the practice was brought to Poverty Point, the ambiguous chronology of plaza construction at Poverty Point limits further conclusions. The smaller post molds noted in association with the midden by Wasp Lake are the only ones of their kind that are well documented at a Poverty Point–associated site. If these represent domestic or utilitarian structures, they carry significant implications for our understanding of mobility and seasonality. Alternatively, given that we know little about Late Archaic monumentality in general, the smaller post configurations could be part of landscape modification practices not yet recognized in the archaeological literature.

Currently available data indicate that the construction of Mounds A and X at Jaketown preceded the construction of the ridges and Mound A at Poverty Point by several generations. Building on this temporal difference, Lee Arco speculated that the arcuate point-bar landscape of Late Archaic Jaketown formed the plan for the ridges at Poverty Point (Kidder 2011). The two sites are mirror images of one another, and the earlier dates at Jaketown could indicate that an architectural plan imported from Jaketown was used to guide the radical reconfiguration of Poverty Point after approximately 3400 cal BP (Kidder 2011, 2012). More chronometric data will elucidate the nature of this recursive—possibly ancestral—relationship. The intentional repetition of architectural layouts at different sites would not be unprecedented. We draw attention to the recapitulation of the architecture of the Anna site at the Emerald Mounds site in the Natchez Bluffs of Mississippi, as well as the concept of “moving mounds” recorded in Bloch’s ethnographic work with a modern Native American community in the Lower Mississippi Valley (Bloch 2020:529). In the latter example, Bloch’s interlocutor describes practices of transporting whole earthworks to new locations, reinforcing the connection between earthworks and theories of landscape animacy present in Native American philosophy (Miller 2015; Watts 2013; Zedeño 2009).

Beyond the Lower Mississippi Valley, communities on the Atlantic Coast also built circular features and erected monumental posts during the Late Archaic (Russo and Heide 2001; Sanger 2021). Furthermore, Middle Archaic earthwork complexes have been identified throughout the Lower Mississippi Valley (Saunders et al. 2005), and earthwork construction continued in the region—and, indeed, at Jaketown—through the historic era (Ford et al. 1955;

Phillips et al. 1951). The extent and diversity of landscape modification in eastern North America is another factor that complicates the delineation of Poverty Point culture as a distinct, exclusive unit of practices. To avoid the issue, the earthworks at Jaketown and Poverty Point should instead be understood as individual, historically particular manifestations of an enduring and diffuse architectural tradition.

2.7.3 Plant Use

Although only three Poverty Point–associated sites have been subject to significant paleoethnobotanical research, differences in plant use across sites suggest a dynamic of localized variation and persistent shared traditions similar to that observed in the architectural record. Paleoethnobotanical assemblages from contexts sampled thus far at Jaketown document a focus on persimmon and chenopod not present at Poverty Point (Ward 1998) or the nearby J. W. Copes site (16MA47; Jackson 1989). Although nearly ubiquitous at Jaketown, persimmon is present in less than a quarter of the contexts sampled at Poverty Point and J. W. Copes; chenopod is comparably hyper-represented at Jaketown (Figure 2.9). Rather than reflecting variation in resource availability alone, we consider the contrasts in plant use to indicate different methods of gathering, processing, and consuming wild foods. Considering the centrality of foodways to cultural identity and processes of social differentiation (Twiss 2012), the emphasis on persimmon at Jaketown is significant. The charred conglomerate of fruit pulp recovered from the pit beneath Mound A bears similarities to the persimmon bread—made by baking or drying long loaves of strained pulp—central to Native American cuisine in the Lower Mississippi Valley during the historic era (Swanton 1911:77).

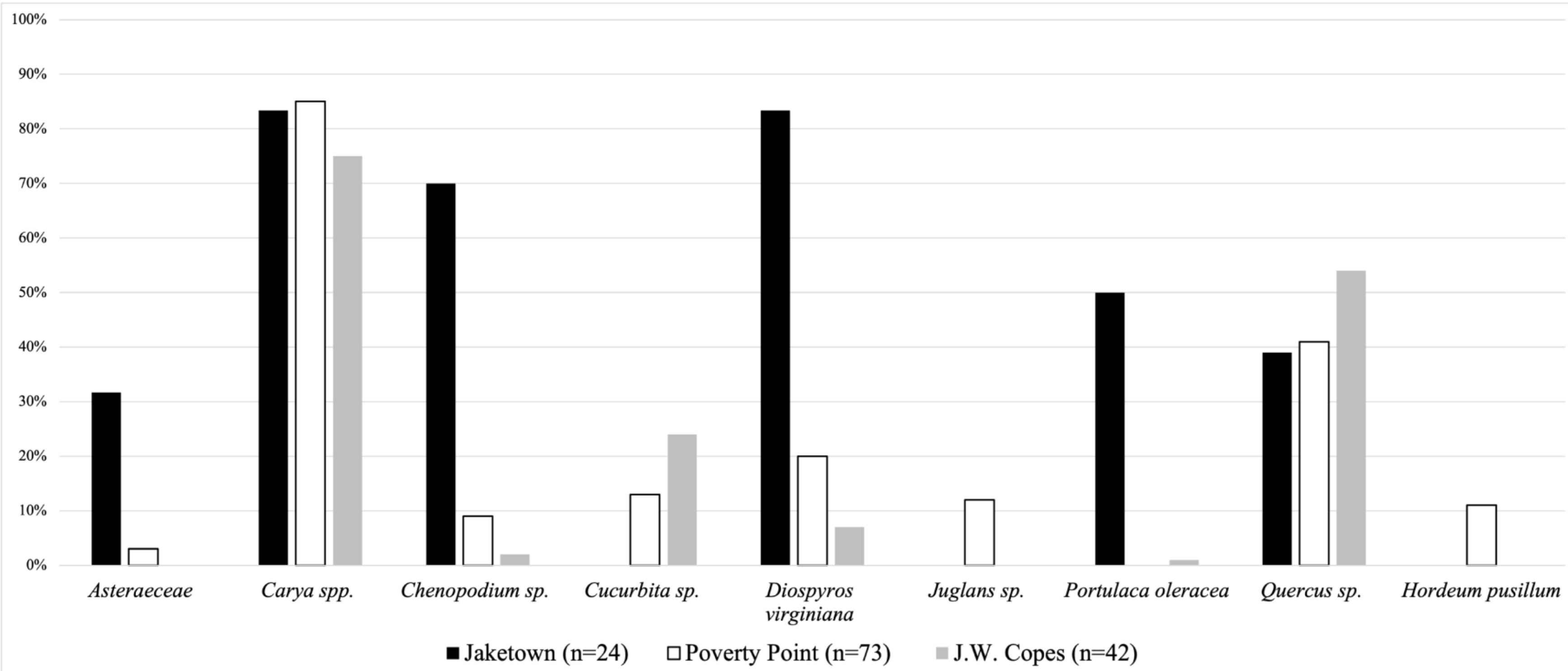

Figure 2.9 Percent ubiquity of taxa in flotation samples analyzed from Jaketown, Poverty Point (Ward 1998: Figures 1 and 4) and J. W. Copes (Jackson 1989: Table 1).

At Jaketown, Poverty Point, and J. W. Copes, people conserved wild food harvesting practices despite exchange connections to regions where communities were growing domesticated members of the Eastern Agricultural Complex, including goosefoot (*Chenopodium berlandieri* var. *jonesianem)*, marsh elder (*Iva annua)*, and sunflower (*Helianthus annus)*. By approximately 3400 years BP, these regions of early domestication overlapped with multiple source areas for lithics found at Poverty Point, Jaketown, and J. W. Copes, including Arkansas (the source of novaculite), the Ohio River valley (Gray Northern Flint), southeastern Missouri (galena), and the Tennessee River valley (Fort Payne, Pickwick, and Dover chert; Gibson 1994:Figure 1; Lehman 1991; Smith 2011:Figure 1; Walthall et al. 1982). The lack of domesticated chenopod or other Eastern Agricultural Complex crops at Jaketown, Poverty Point, and J. W. Copes[1] suggests that communities maintained a mode of food production distinct from practices known within their larger social network. This distinction could be the result of ritual rules restricting consumption to particular foods adhered to by visitors during aggregation events, comparable to situational or ideological food taboos documented in other cultures (Twiss 2012). Later residents of the Lower Mississippi Valley continued to emphasize wild plant gathering over the adoption of Eastern Agricultural Complex crops—despite social connections to agricultural regions—until shortly before European contact (Fritz 2007; Fritz and Kidder 1993).

Although seeds in the Jaketown chenopod assemblage do not exhibit markers of domestication—mainly a significantly reduced seed coat—there is variation in seed morphology. Further morphometric analysis is ongoing. Managed or not, chenopod is a disturbance taxa—a plant that grows best in newly overturned soil—and its inclusion in archaeological contexts can indicate either alluvial or anthropogenic soil disturbance around the site at the time of deposition. This fits the contexts in which chenopod has been identified at Jaketown, including pit fill, middens, and deposits associated with earthwork construction. The plant may have thrived in the regularly disturbed earth of Jaketown's anthropogenic landscape, and, considering its edible greens and starchy seeds, people may have let it grow while clearing other species. This form of relationship, characterized by regular interaction but not necessarily domestication, remained a key aspect of peoples' relationships with plants in the Lower Mississippi Valley for millennia (Fritz 2007). It also closely resembles the people–plant relationships characteristic of certain eras in Amazonia—another region known for social variability and multipolar social structures (Fausto and Neves 2018; Heckenberger et al. 2008).

2.8 Conclusions

As noted by generations of anthropologists and archaeologists (e.g., Brain 1978; Feinman and Neitzel 2020; Holland-Lulewicz 2021; Mauss 2006; Wolf 1984), culture histories and similar heuristics are only useful insofar as they help explain real social processes. Following this logic, we find that the Poverty Point culture-historical unit fails to explain—and indeed obscures—prominent social processes observed in the archaeological records of Jaketown and Poverty Point, including the maintenance of long-term exchange relationships and differential, selective engagement with shared architectural traditions and foodways. These facets of Poverty Point culture—extralocal signatures and diverse practices across sites—have long been recognized by researchers working in the region (Gibson 1994, 2000; Phillips et al. 1951; Webb 1982). However, the strictures imposed by the culture historical unit itself have obscured the full significance of the societies of the Late Archaic Lower Mississippi Valley to the broader scope of hunter-gatherer social theory and North American history. Poverty Point is often described as unprecedented in terms of scale, architectural elaboration, and the accumulation of exchanged resources. But it is exactly its position within a broader network of geographically dispersed and temporally staggered sites, including Jaketown, that stands to illuminate the theoretical and historical significance of what we have thus far referred to as the Poverty Point culture. Life at Jaketown incorporated links with distant communities from the first known instance of activity at the site during the Late Archaic. Built before the apex of construction at Poverty Point, the Jaketown earthworks, even in their disturbed state, represent a different era and stylistic expression of Late Archaic monumentality. Localized foodways, such as persimmon processing at Jaketown, are nested within a conservative tradition of wild plant harvesting shared by communities throughout the Lower Mississippi Valley. These practices were ordered by social relationships and historical events—kin networks and ancestries, cycles of aggregation and redistribution, landscape modification projects—that are the subject of recent and ongoing research (e.g. Bloch 2019; Clark 2004; Gibson 2021; Greenlee et al. 2014; Hays 2018; Howe 2014; Jackson 1991; Kidder 2011; Sherman 2019; Spivey et al. 2015). We look forward to following such threads beyond the constraints of the concept of Poverty Point culture.

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Notes

1. It remains undetermined whether the Cucurbita pepo rind fragments identified at Poverty Point and J. W. Copes represent a domesticated variety.

Chapter 3:
Is There a Poverty Point Culture? Revising the History of the Late Archaic Lower Mississippi Valley, USA

Seth B. Grooms, Grace M. V. Ward, and Tristram R. Kidder

3.1 Abstract

The Poverty Point site, located in the Lower Mississippi Valley of the southeastern United States, is commonly viewed as a center of innovation that exported new material culture, practices, and identity to presumably contemporary sites in the region. Recent ^{14}C data, however, show that Jaketown, previously interpreted as a peripheral expression of Poverty Point culture, is earlier than the type site. Using the revised chronology at Jaketown as a case study, we argue that assuming the radial diffusion of cultural innovations biases our understanding of social change and obfuscates complex histories.

3.2 Introduction

Categorical approaches in archaeology rely on normative designations and types as heuristics in the absence of high-resolution datasets (Holland-Lulewicz 2021; Kosiba 2019). These devices remain entangled in our explanatory models today despite advances in archaeological science and significant critique (Henry *et al.* 2017; Howey & O'Shea 2009; Jones 2002: 106-110; MacEachern 2000; O'Brien & Dunnell 1998: 30; Pestle *et al*. 2013; Terrell *et al.* 1997; Wright 2017). Highly accurate AMS chronologies, however, allow us to see history at an unprecedented resolution approaching the human generational scale, supporting theoretical frameworks that understand social change in the past as dynamic and contingent, not monolithic and teleological. The latter characteristics are implied by models that explain the spread of materials and cultural practices as radial diffusion from a single site or area. Here we present the Late Archaic Poverty Point culture of the Lower Mississippi Valley (LMV) as an example of how categorical approaches to diffusion obstruct archaeological research and obscure history. We offer the revised AMS chronology of the Jaketown site – a Late Archaic earthwork complex located in west central Mississippi – as a globally relevant case study for moving beyond categorical models of social change while offering analytically robust interpretation at a regional scale.

Though long central to archaeological theory, critical engagement with diffusion has fallen off in recent decades (but see Chami 2007; Mills 2018). Following diffusionist models, Poverty Point, located in northeast Louisiana, has long been interpreted as the type site of the Poverty Point culture and, as such, the source of a suite of cultural innovations observed at presumably contemporary sites in the region (Figure 3.1) (Webb 1982). This model employs categorical units, including the archaeological culture, a type site, a diffusionist mechanism for the spread of cultural traits from the type site to the periphery, and a low-resolution regional chronology that makes it appear as though sites with similar material culture and practices are contemporaneous with and therefore influenced by the type site. Such typological approaches and their reliance on radial diffusionist mechanisms to build regional histories are increasingly at odds with archaeological data. Recent work at the Poverty Point site has revealed a complex construction history and documented architectural features and a material assemblage not replicated fully anywhere else (Hargrave *et al.* 2021; Kidder *et al.* 2021). Based on material culture alone, the Poverty Point site appears to be an endpoint or cultural sink where many groups with distinct histories and practices converged to create a unique cultural collective

Figure 3.1: The location of the Poverty Point and Jaketown sites.

(Kidder 2011, 2012; Kidder & Sassaman 2009; Sassaman 2005; Spivey *et al.* 2015). As a place of mass aggregation, Poverty Point remains globally unique regardless of the metric of comparison (i.e., size, the scale of earthworks, material assemblage, the configuration of earthworks, etc.).

Chronostratigraphic data from the Jaketown site show that people were engaging in practices typically associated with the so-called Poverty Point culture by ca. 4500-4000 cal yr BP. These dates are conservatively 400 years earlier than the oldest dates derived from the Poverty Point site. We do not use the revised chronology of Jaketown presented here to extend the chronology of the so-called Poverty Point culture back in time. Instead, Jaketown serves as a data point for understanding the social processes and histories that led to the creation of the Poverty Point site as a place of cultural convergence where many different histories and practices are manifest. We conclude that these practices – including earthwork construction – originated in diverse locations across the LMV and beyond and converged at Poverty Point. Accordingly, except for our historical overview of the term, we avoid using "Poverty Point culture" to describe the people living at Jaketown and instead use the term Late Archaic period to situate their actions temporally in the span from ca. 4500-3200 cal yr BP. The term Late Archaic is, of course, also a typological designation laden with problematic assumptions. However, its value as a descriptive shorthand outweighs its potential to reify the assumptions outlined above if it is used strictly to communicate time and not conflated with homogenous biological and cultural groups or intended to represent teleological change.

3.3 Overview of the Poverty Point Culture

Poverty Point is a sprawling complex of geometric earthworks covering approximately 200 ha on Macon Ridge, a Pleistocene-age terrace, in northeast Louisiana (Figure 3.2). It is an exemplar of conspicuously complex behavior by foraging people (Wright & Gokee 2021). As such, it is a globally important case study of the effects normative categories and assumed processes have on our analyses as we attempt to understand the forms of social organization underlying a singular expression of human creativity. People moved an estimated 1,000,000 m^3 of earth to create the monumental landscape at Poverty Point (Kidder 2011). Mound A is among the largest mounds in North America, comprised of roughly 238,500 m^3 of earth, and was built in no more than 90 days (Ortmann & Kidder 2013). Recent work demonstrates that at least one segment of the iconic concentric ridges, Ridge West 3, was also built rapidly (Kidder *et al.* 2021). The inhabitants of Poverty Point also imported a staggering amount of nonlocal stone, measured in metric tons (Gibson 2000: 219-222). Geophysical survey discovered 36 timber post circles ranging up to 62 meters in diameter in a 25 ha. area in and around the anthropogenic plaza, further demonstrating the site's complex construction history (Hargrave *et al.* 2021). Foragers terraformed the landscape at Poverty Point to fit their social and cultural needs (Gibson 2019: 53-75; Grier & Schwadron 2017; Randall & Sassaman 2017), and while some theoretical frameworks (Earle 2021: 80) assume that such coordination would be possible only under a centralized, hierarchical political system, there is no evidence of hierarchy at Poverty Point (Kidder 2012: 464). The scale of earth moving at Poverty Point, in addition to the enormous quantities of exotic stone brought there from sources spanning half the continent, suggest forms of social organization and leadership that contradict traditional models offered for foraging groups. Consequently, the size and structure of the society centered on Poverty Point is a matter of debate (Gibson 2007; Kidder 2011: 95-119; Milner 2021: 54; Sassaman 2005; Spivey *et al.*

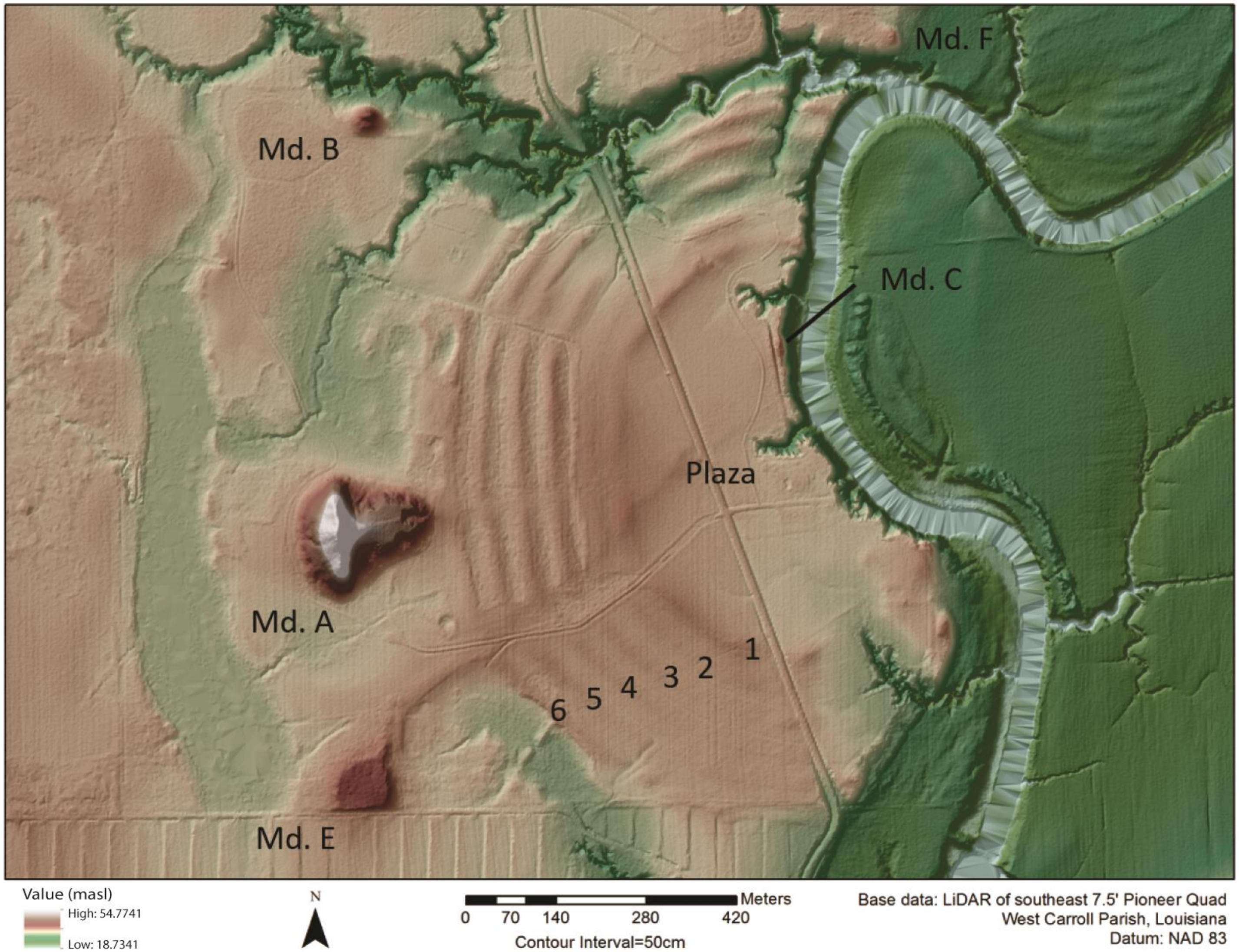

Figure 3.2: LiDAR DEM of the Poverty Point site showing mounds, six ridges, and plaza.

2015: 141-159; Stanish 2017: 247-248). We argue that archaeological categories have heavily influenced interpretations of the Poverty Point site. Thus, the Poverty Point site and culture are ideal case studies of the limits of categorical explanatory frameworks.

The Poverty Point culture is a culture-historical unit used to describe sites in the LMV by temporal association with the Poverty Point site; the presence of earthworks; the use of baked clay objects called Poverty Point Objects (PPOs); use of nonlocal lithic materials; diagnostic projectile points and microlithic tools; a lapidary industry emphasizing beads, gorgets, and plummets; and a forager subsistence strategy. However, hundreds of sites in the LMV produce these material traits to varying degrees, and chronological control for these sites is poor. Consequently, their temporal relationship with the Poverty Point site is ambiguous. Yet, these sites are said to have participated in the Poverty Point culture and acquired their cultural identity from the type site (Gibson 2000: 196; Webb 1982: 14). Poor chronological control, coupled with ambiguous criteria used to designate a site as a Poverty Point affiliate, results in an overreliance on the chronology of, and material traits derived from, the type site to explain Native American history in the American Southeast.

The history of Poverty Point is the opposite of what we should expect if it were a center or beginning (Kidder 2012: 467). The smallest mounds at Poverty Point were built first, while Mound A, the largest mound, was built close to the site's abandonment. Furthermore, the earliest dated sites that produce Poverty Point-like material culture are far from the type site. As noted above, Jaketown, ~100 km away, is the best-dated Archaic site in the LMV and produces classic Poverty Point material culture predating the earliest component at the type site by at least 400 years (Ward *et al.* 2022). We argue that temporality and diffusion, as currently conceptualized in the LMV, are the primary impediments to understanding the Poverty Point phenomenon outside a culture-historical framework. The region lacks a secure chronological framework to contextualize the histories of supposed Poverty Point-affiliated sites (Gibson 2007: 40-41). Consequently, the chronology of the type site is important for contextualizing developments at Jaketown and assessing diachronic differences.

In what follows, we trace key practices, including mound building, to demonstrate the explanatory potential of regional chronological modeling. The earliest documented mounds in North America were built in the LMV during the Middle Archaic period (ca. 5700-4700 cal yr BP). Then, for reasons currently unknown, earthwork construction ended abruptly (Arco *et al.* 2006; Gibson 2006; Kidder 2006; Saunders *et al.* 2005). The hiatus lasted for ~1,000 years before the tradition was revived in Late Archaic times. Consequently, the Jaketown and Poverty Point sites are important for understanding the social dynamics of the revival of monument construction, the emergence and spread of associated Poverty Point material culture, and the historical sequences underlying both.

3.4 The Chronology of the Poverty Point Site

There are 80 chronometric dates available for the Poverty Point site. However, the chronology of the site is still debated and remains equivocal (Ortmann 2010). Most chronological models produce similar occupation spans (ca. 3600-3000 cal yr BP) but differ in the pace of earthwork construction (Connolly 2006; Gibson 2000: 94-96; Kidder *et al.* 2021; Ortmann 2010; U.S. Department of the Interior (DOI) 2013: 72). Kidder *et al.* (2021) argue that most earthwork construction was rapid and occurred late in the occupation span (after ca. 3400 cal yr BP), but others argue that construction progressed more gradually throughout the history of the site (DOI 2013: 30-56; Gibson 2019: 33; Hargrave *et al.* 2021). Despite the ambiguous chronology at Poverty Point, the trend of the last few decades has been to apply the chronology of the type site, whether implicitly or explicitly, to other Poverty Point-affiliated sites. Some have gone so far as to advise that archaeologists not bother dating Poverty Point-affiliated sites because of their assumed contemporaneity with the type site (Gibson & Melancon 2004: 228).

In contrast to the Poverty Point site chronology, our findings show that Jaketown was occupied by people practicing some behaviors traditionally associated with the Poverty Point culture by ca. 4500-4000 cal yr BP and were building mounds by ca. 3400 cal yr BP. These data do not support the hypothesis that all Poverty Point culture sites are coeval; in fact, our data indicate that the monumental landscape at the Poverty Point site may be the culmination of deeper and more varied histories rather than a catalyst (Kidder 2012; Sassaman 2005).

3.5 The Jaketown Site Description and Previous Research

Jaketown was occupied ca. 4500-4000 cal yr BP, during the Late Archaic period, and up to late pre-contact times (ca. 700 cal yr BP). However, the Late Archaic occupation was the most extensive (Ford *et al.* 1955: 104; Lehmann 1982). A total of 15 mounds have been documented at Jaketown, though many have been destroyed (Figure 3.3). Of these, Mounds A, G, and X are confirmed Late Archaic period constructions. A sandy point bar underlies most of the site at an average of 3-4 meters below the ground surface. A catastrophic flood sometime after ca. 3300 cal yr BP but before 2780 cal yr BP buried the Late Archaic occupation at Jaketown while depositing a crevasse splay that stratigraphically separates the Late Archaic component from subsequent occupations (Kidder *et al.* 2018; Kidder 2006). The presence of the point bar below the Late Archaic occupation and the crevasse splay deposit above it provides distinct

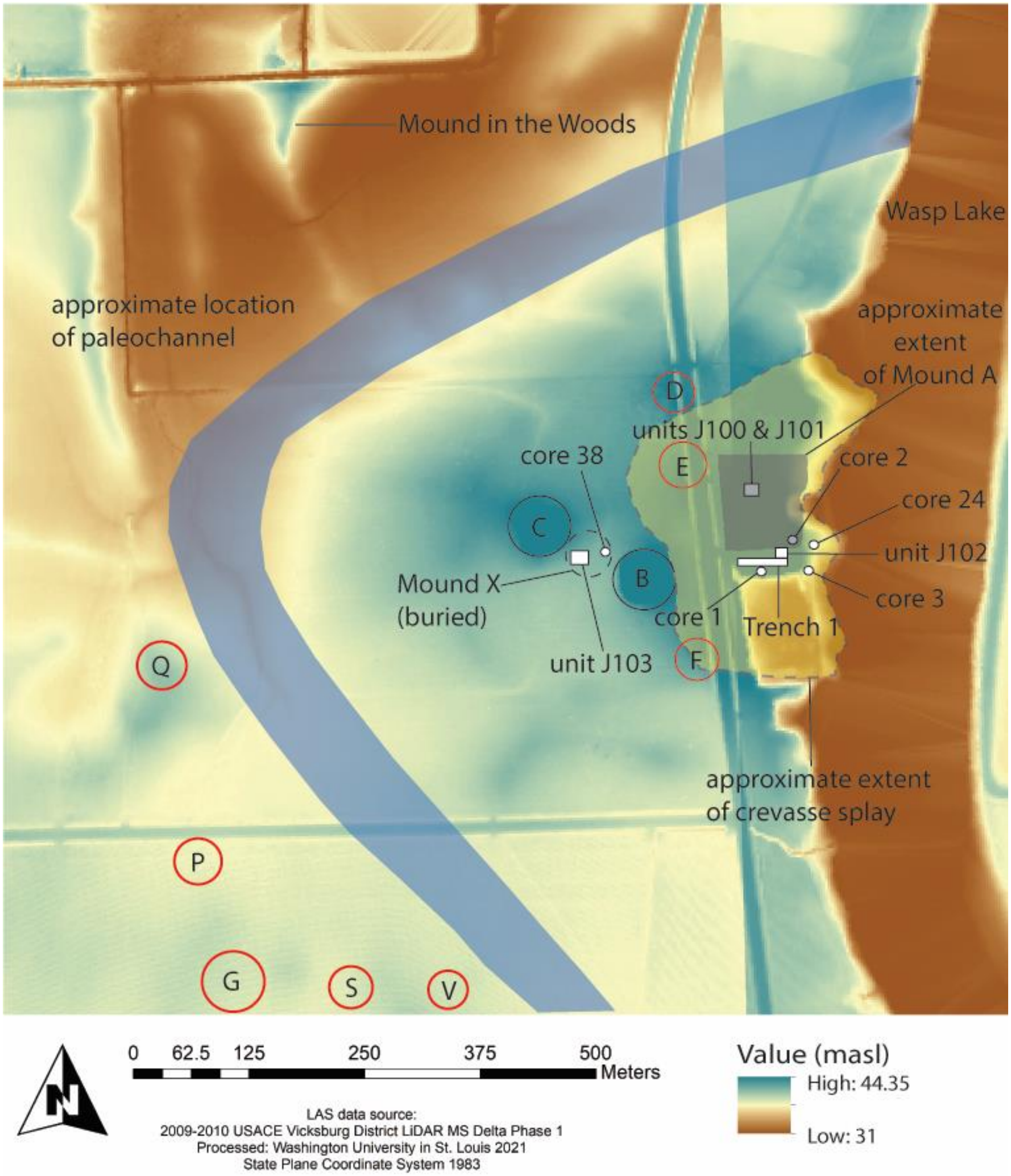

Figure 3.3: LiDAR DEM of Jaketown showing excavation areas, cores discussed in the paper, and 13 of the 15 mounds. The blue crescent shape marks the approximate location of a paleochannel. Letters circled in black are visible mounds; those in red are mounds reported by Ford et al. (1955) but are no longer visible.

stratigraphic boundaries, creating a useful *terminus post quem* and *terminus ante quem* across the site.

Jaketown was designated as a peripheral expression of Poverty Point culture in the mid-twentieth century (Ford *et al.* 1956: 116; Phillips 1970: 10, 15, 524-532; Phillips *et al.* 2003 [1951]: 279-281). Using early carbon dating technology, excavators used five radiometric samples to establish the age of the Poverty Point component at Jaketown (Table 3.1). Those samples span 3820-1830 cal yr BP, placing the Poverty Point-affiliated occupation at Jaketown either relatively early (ca. 3800 cal yr BP) in the Late Archaic era or very late (ca. 1800 cal yr BP).

Saunders and Allen (2003) extracted three soil cores to obtain new ^{14}C samples to corroborate the dates reported by Ford and colleagues. The stratigraphy observed in the cores matched prior excavations and produced dates ranging from 4230-3230 cal yr BP. This sampling showed that the initial component at Jaketown was early (ca. 4200 cal yr BP) compared to the Poverty Point site (ca. 3600 cal yr BP).

3.6 Methods

3.6.1 Field Methods

From 2018 to 2020, we excavated two units and re-excavated four contexts investigated previously (Figure 3.3). We used a backhoe in re-excavated contexts to remove most backfill and exposed intact stratigraphic profiles by hand.

3.6.2 Chronological Modeling Methods

In total, 32 ^{14}C samples have been collected from the Jaketown site (Table 3.1). Our chronological model was created using the OxCal 4.4 software (Ramsey 2009a), and the ^{14}C measurements were calibrated using the IntCal20 calibration curve (Reimer *et al.* 2020). We omitted six ^{14}C measurements, including one AMS date, and all five of Ford and colleagues' radiometric dates. Our justifications for omitting these dates are provided in Appendix A. Omissions were made following established outlier detection and omission protocols (Ramsey 2009b). All posterior density estimates (modeled age ranges) are rounded to the nearest five years, italicized (Bayliss *et al.* 2007: 5), and reported at the 95.4% (2 σ) level unless otherwise noted. Unmodeled calibrated dates are rounded to the nearest five years, reported at the 2σ level unless otherwise noted, and are not italicized.

3.7 Chronostratigraphy at Jaketown

We distinguish four phases of occupation at Jaketown. Below is a summary with time spans for each phase based on the chronological model (Figure 3.4).

Phase 1: Initial Occupation

Start: *4570-3820* cal yr BP | End: *3820-3455* cal yr BP (2 σ)

Start: *4440-4000* cal yr BP | End: *3755-3535* cal yr BP (1 σ)

The initial occupation is represented by a pit dug into the point bar beneath Mound A in unit J101 (Figure 3.5). Two ^{14}C samples from the pit date to 4145-3870 cal yr BP (B-253774) and 4525-4100 cal yr BP (UGA-41847) and are associated with a large biconical PPO, abundant PPO fragments, and some nonlocal lithic flakes (Figure 3.6). Based on visual inspection, seven of the nine chipped stone pieces recovered from the pit are novaculite sourced to central Arkansa

Table 3.1. Calibrations made in OxCal v4.42 (Bronk Ramsey 2020) using IntCal20 calibration curve (Reimer et al. 2020). Dates have been rounded to nearest 5 years. Omissions from Model E are highlighted in red.

Sample ID & Lab No.	Method	Provenience	Context	Material	13c/12c ratio	Con. RC age (yr BP)	2σ (cal yr BP)	Probablity under distribution (%)	2σ date range (yr BP)	Source
24.OS-159306	AMS	Trench 1 N Profile	stratum 4	nut shell (Carya)	n/a	3190± 20	3450-3370	95.4	3450-3370	Ward et al. 2021
31.OS-160358	AMS	Trench 1 N Profile	stratum 2	nut shell (Carya)	n/a	3160± 20	3450-3350	95.4	3450-3350	Ward et al. 2021
25.OS-159311	AMS	Trench 1 N Profile	stratum 2/1	nut shell (Carya)	n/a	5290± 35	6190-5985 5970-5940	89.3/6.2	6190-5940	Ward et al. 2021
1.B-252853	AMS	J100 S Profile (MD-A)	EW midden, above crevasse deposit	UID wood charcoal	-24.5 ‰	2440± 50	2710-2625 2620-2350	22.3/73.2	2710-2350	Kidder et al. 2018
2.B-253789	AMS	J100 S Profile (MD-A)	Below crevasse deposit; upper PP midden on top of md construction fill	UID wood charcoal	n/a	3120± 40	3445-3420 3410-3220	4.3/91.1	3445-3220	Kidder et al. 2018
3.UGA-38993	AMS	J100 E Profile (MD-A)	stratum 4; upper PP surface below	Seed (Diospyros virginian	-25.94 ‰	3110± 20	3385-3320 3305-3245	55.6/39.8	3385-3245	Ward et al. 2021

			crevasse	a)						
4.B-252854	AMS	J100 S Profile (MD-A)	Stratum 2	UID wood charcoal	-26.5 ‰	3220± 40	3560-3530 3495-3360	3.1/92.3	3560-3360	Kidder et al. 2018
5.UGA-38992	AMS	J100 E Profile (MD-A)	Stratum 2	Seed (Diospyros virginiana)	-25.48	3150± 20	3445-3420 3415-3335 3285-3270	11.2/81.3/2.9	3445-3270	Ward et al. 2021
6.UGA-38991	AMS	J100 E Profile (MD-A)	Stratum 2	Seed (Diospyros virginiana)	-25.33	3150± 20	3445-3420 3415-3335 3285-3270	11.2/81.3/2.9	3445-3270	Ward et al. 2021
7.B-253774	AMS	J100 N Profile (MD-A)	Pit beneath MD-A; assoc. with PPO	UID wood charcoal	-27.0 ‰	3660± 40	4145-4125 4095-3870	1.9/93.5	4145-3870	Kidder et al. 2018
8.UGA-41847	AMS	J100 N Profile (MD-A)	Pit beneath MD-A; assoc. with PPO	Seed (Diospyros virginiana)	-23.39 ‰	3910± 70	4525-4145 4115-4100	94.9/0.6	4525-4100	Ward et al. 2021
9.B-263583	AMS	J102 E-F1RC-1 (MD-A)	Early woodland tetrahedron-filled pit excavated into upper surface of	UID wood charcoal	-27.0 ‰	2570± 40	2760-2685 2645-2610 2600-2495	56.1/10.6/28.8	2760-2495	Kidder et al. 2018

			crevasse deposit							
10.B-263420	AMS	J103 E Profile (MD-X)	Stratum 6	UID wood charcoal	-23.7 ‰	3280± 40	3580-3395	95.4	3580-3395	Kidder et al. 2018
11.B-263421	AMS	J103 E-PRC-9 (MD-X)	Stratum 2	UID wood charcoal	-27.1 ‰	3220± 40	3560-3530 3495-3360	3.1/92.3	3560-3360	Kidder et al. 2018
12.B-264059	AMS	J103 W-PRC-1 (MD-X)	Stratum 2	UID wood charcoal	-23.3 ‰	3340± 40	3690-3660 3645-3465	6.2/89.3	3690-3465	Kidder et al. 2018
13.UGA-41848	AMS	J103 (MD-X)	Stratum 2; FS#43 from PPO concentrati on	nutshell (*Carya)*	-24.05 ‰	3200± 25	3455-3370	95.4	3455-3370	Ward et al. 2021
14.OS-151671	AMS	J103 (MD-X)	Stratum 2	Seed (Diospyr os virginian a)	n/a	3170± 20	3450-3360	95.4	3450-3360	Ward et al. 2021
15.B-555137	AMS	J103 (MD-X)	Stratum 4, midden-fill	soapsto ne sherd residue	-25.2 ‰	3260± 30	3565-3440 3435-3395	81.6/13.8	3565-3395	Ward et al. 2021

16.AA-83901	AMS	Core 38C (MD-X)	Between Mounds B & C; near J103 excavation area	UID wood charcoal	-26.4 ‰	3416± 64	3835-3485	95.4	3835-3485	Kidder et al. 2018
17.AA-83903	AMS	Core 38I (MD-X)	Below crevasse deposit; upper surface of mound	UID wood charcoal	-26.8 ‰	3201± 39	3485-3350	95.4	3485-3350	Kidder et al. 2018
18.AA-83902	AMS	Core 38F (MD-X)	Upper part of stratum 4 (midden-fill)	UID wood charcoal	-25.3 ‰	3585± 40	4065-4045 3990-3820 3795-3765 3755-3720	1.4/85.3/5.2/3.6	4065-3720	Kidder et al. 2018
19.B-236318	AMS	Core 24 (MD A area)	Strat. 5, 4Ab; below crevasse deposit; upper surface of mound	UID wood charcoal	-25.9 ‰	3170± 40	3465-3330 3290-3260	90.1/5.4	3465-3260	Kidder et al. 2018
20.B-156646	AMS	Core 2 (MD A area); 3A3b (264–275 cmbs)	From middle of basal PP midden near MD-A area; E of J100 & J101/J102; near Core	UID wood charcoal	n/a	3150± 50	3460-3235	95.4	3460-3235	Saunders and Allen 2003

			24							
21.B-235218	AMS	Core 24 (MD A area; 312cmbs)	Strat 21, 14Ab4/15Ab, 33.1 amsl; basal PP midden	UID wood charcoal	-27.3 ‰	3260±40	3570-3390	95.4	3570-3390	Kidder et al. 2018
22.B-157421	AMS	Core 3 (MD A area; 3A1b, 168–180 cmbs)	From upper portion of basal PP midden; E of Trench 1 and J101/J102	UID wood charcoal	n/a	3350±40	3690-3655 3650-3465	9.4/86	3690-3465	Saunders and Allen 2003
23.B-154428	Radiometric	Core 1 (T1 area; 2A3b 160–180 cmbs)	From middle of basal PP midden in T1/Mound A area	organic sediment	n/a	3630±80	4225-4205 4155-3810 3805-3715 3710-3700	0.7/85.6/8.8/0.3	4225-3700	Saunders and Allen 2003
26.UGA-14091	AMS	Core 1 (Mound C)	MD C 2.2-2.4 mbs, Ab1, surface, stage I mound	cane charcoal	n/a	740±40	730-645 585-565	91.0/4.4	730-565	Saunders and Jones 2004: 67-70

27.M-216	Radiometric	Trench 5 square 0-2, stratum 2 level	"Charcoal from Poverty Point cultural deposits."	charcoal	n/a	2830± 300	3820-3795 3725-2300 2230-2180	0.3/94.5/0.7	3820-2180	Ford and Webb 1956: 121
28.L-114	Radiometric	Mound A	West end of Trench 5, stratum 2 above sand bar	charcoal	n/a	2350± 80	2710-2295 2265-2150	81.2/14.3	2710-2150	Ford and Webb 1956: 121
32.L-115	Radiometric	Mound A	West end of Trench 5, stratum 2 above sand bar		n/a	±				Ford and Webb 1956: 121
29.O-41	Radiometric	Unknown	"Shell from Poverty Point cultural deposits."	shell	n/a	2560± 100	2850-2810 2800-2355	3.3/92.1	2850-2355	Ford and Webb 1956: 121
30.O-46	Radiometric	Unknown	"Bone from Poverty Point cultural deposits."	bone	n/a	2150± 110	2360-1830	95.4	2360-1830	Ford and Webb 1956: 121

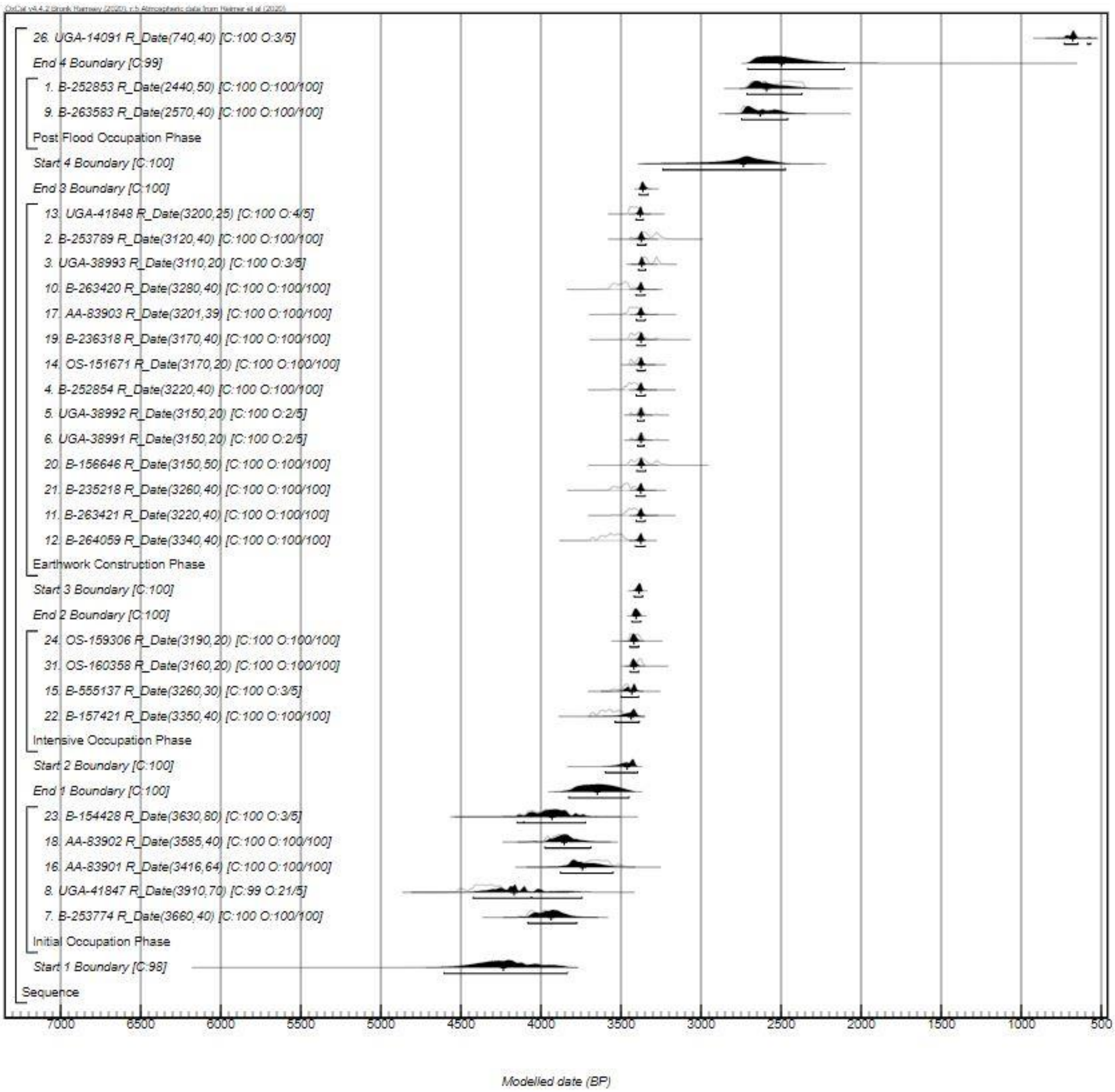

Figure 3.4: Chronological model referenced in text and presented multi-plot view. For table view see Appendix A.

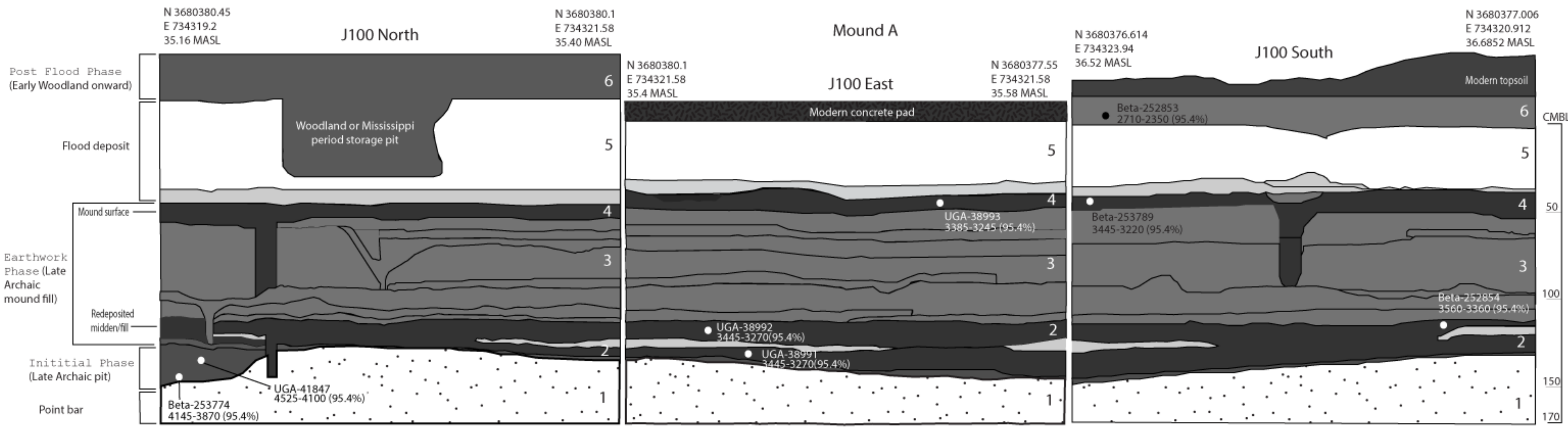

Figure 3.5: The north, east, and south profiles of unit J100 in Mound A. `Courier New` font represents the stratigraphic contexts the chronological model is based on. For example, ^{14}C samples from the Initial Phase context in J100 north comprise the Initial Phase in the model shown in figure 4. The numbers along the right side of each profile are stratigraphic units.

Figure 3.6: Biconical Poverty Point Object fragment recovered in the pit beneath Mound A.

(Lehmann 1982: 14). These dates, along with their artifact associations, demonstrate that people at Jaketown were involved in exchange networks and adopting technologies manifest at the Poverty Point site roughly a millennium later.

Phase 2: Intensive Occupation

Start: *3585-3395* cal yr BP | End: *3445-3380* cal yr BP (2 σ)

Start: *3505-3425* cal yr BP | End: *3440-3400* cal yr BP (1 σ)

The intensive occupation is represented by strata and features in Trench 1, midden east of Mound A, and midden that was later repurposed for mound fill during the subsequent earthwork construction phase. In Trench 1, we encountered two organically enriched strata on top of the point bar (Figure 3.7). We documented four large (~30 cm wide) postholes originating from the top stratum in the north profile. Similar-sized postholes are documented in unit J102 about 13 meters east of the Trench 1 postholes, and the two sets may form one large feature. In Trench 1, carbon from the upper stratum flotation sample returned a date of 3450-3370 cal yr BP (OS-159306), and carbon from the lower stratum sample returned a date of 3450-3350 cal yr BP (OS-160358).

Deposits representing this phase were mined from their original depositional context and used as fill in Mounds A and X. In Mound A, the stratigraphic boundaries of the redeposited midden-fill are abrupt; chunks of unfired clay and PPO fragments are incorporated throughout, indicating the midden was mixed with clay and other materials before being used as mound fill.

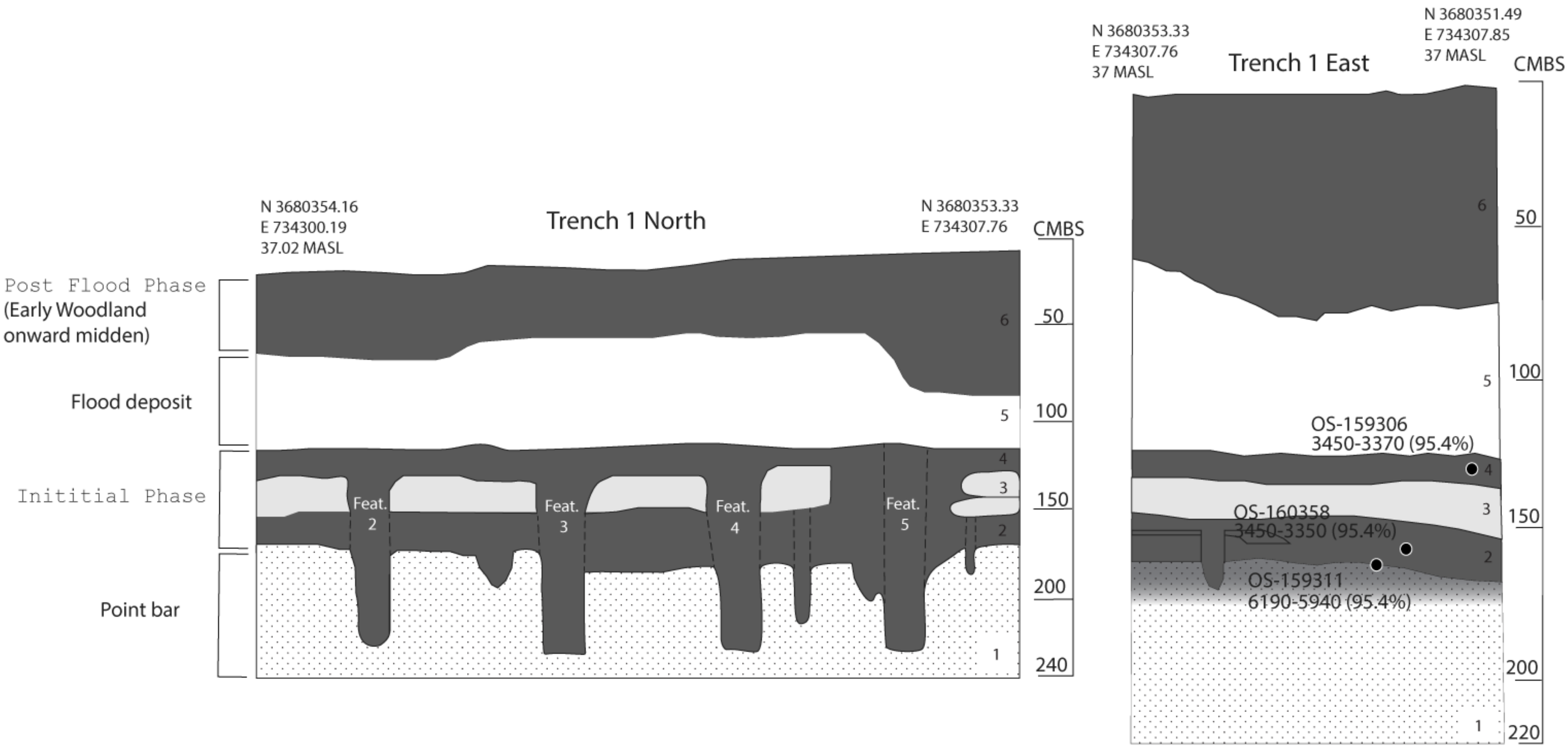

Figure 3.7: Trench 1 north and east profiles. `Courier New` font represents the stratigraphic contexts the chronological model is based on. The numbers along the right side of each profile are stratigraphic units.

Stratum 4 in Mound X is repurposed midden-fill representing this phase (Figure 3.8). The midden deposits that were gathered and used to construct Mound X are older than the mound itself and thus represent an earlier and substantial occupation of the site (the intensive occupation). Two ^{14}C measurements (B-555137 and AA-83902) from this zone are out of stratigraphic order indicating that midden-fill was redeposited. Sample B-555137 is from a soapstone sherd we recovered from the midden-fill. Carbon residue from the sherd dates to 3565-3395 cal yr BP, demonstrating that the Late Archaic occupants of Jaketown were acquiring soapstone – not local to the LMV – during the intensive occupation and before earthwork construction.

There are many isolated postholes and deep middens east of Mound A. Saunders and Allen (2003) date the basal midden from this context to 3690-3465 cal yr BP (B-157421). Thus, the midden deposits on the bank of Wasp Lake represent the intensive phase or possibly a mix of initial and intensive phase deposits. In either scenario, these deposits predate the earthwork phase and the construction of Mound A.

Phase 3: Earthwork Construction

Start: *3425-3365* cal yr BP | End: *3390-3325* cal yr BP (2 σ)

Start: *3405-3375* cal yr BP | End: *3380-3350* cal yr BP (1 σ)

Mounds A and X were built quickly at ca. 3400 cal yr BP. In both mounds, ^{14}C measurements from the initial mound deposits overlap with those from the mound surfaces. The abrupt stratigraphic boundaries between mound fill deposits and the absence of pedogenesis in the mound fill layers or at interfaces also demonstrate rapid construction.

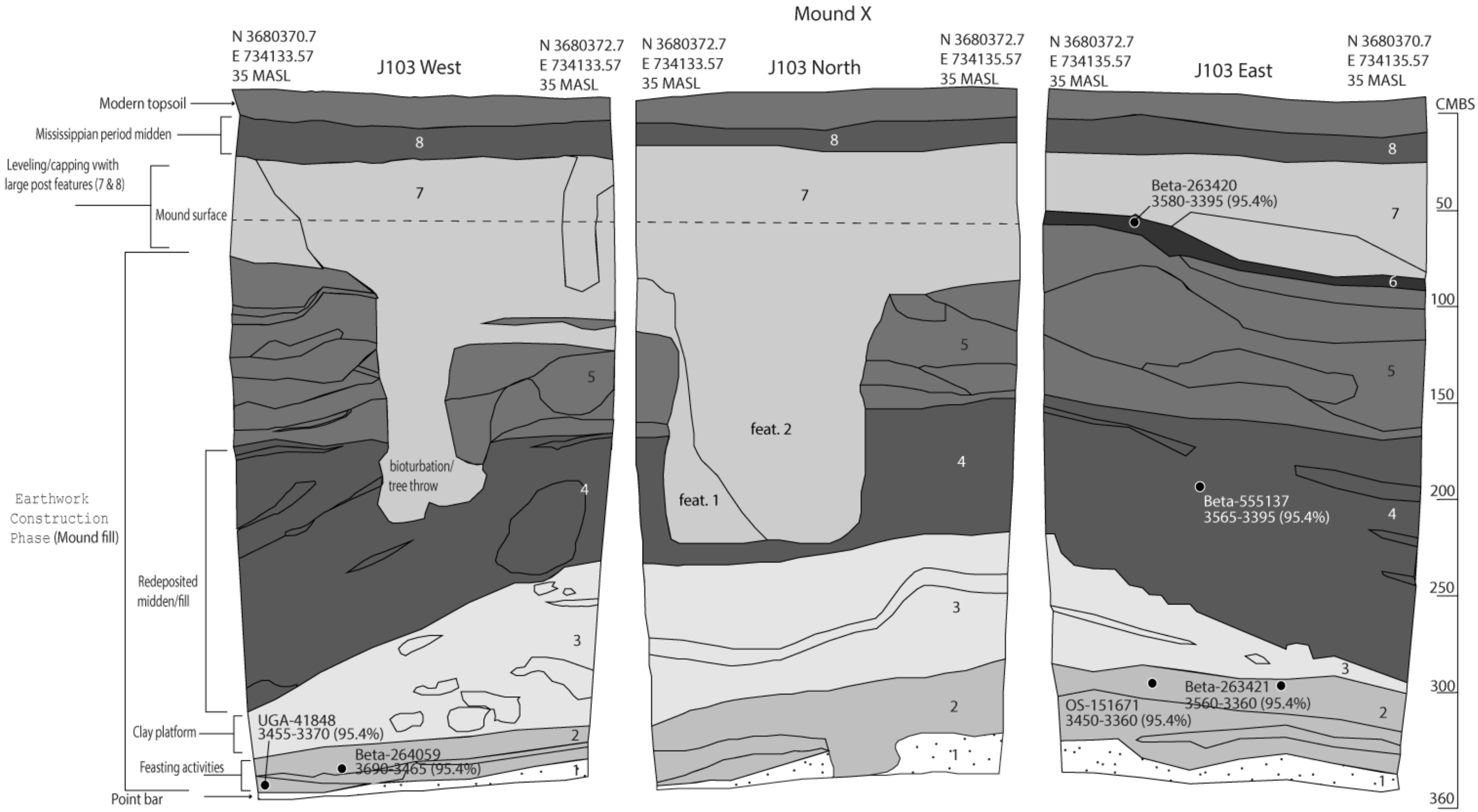

Figure 3.8: The west, north, and east profiles of unit J103 in Mound X. The dashed portion of the mound surface in the west and north walls is an extrapolation from the preserved mound surface, stratum 6, in the east wall. `Courier New` font represents the stratigraphic contexts that the chronological model is based on. Numbers represent stratigraphic units.

There are two large (~90 cm wide) post features that originate from the surface of Mound X (Figure 3.8 features 1 & 2). The features overlap and suggest a sequence of building, post removal, reconstruction, and capping. After initial emplacement, the first post was removed and replaced by another. Eventually, the second post was removed, and both pits were filled in with a homogenous silty clay loam fill (stratum 7) that leveled the area and capped the earthwork. Stratum 2 is an organically enriched anthropogenic layer that lies beneath the first obvious Mound X deposit, stratum 3. Stratum 2 contains two intact PPO concentrations, two combustion features, and an assemblage of mammalian long bones, likely deer, oriented in a way that suggests deposition in a single event (Figure 3.9). Stratum 2 has carbonized organic material distributed throughout, and PPO fragments are abundant. Considering the presence and orientation of the deer bone, the multiple combustion features, PPO clusters, and abundant organic material representing fall-fruiting species, we interpret stratum 2 as a feast or rapid sequence of feasts held sometime between September and November (Ward *et al.* 2022). The ^{14}C measurements from stratum 2 (B-264059, UGA-41848, and OS-151671) overlap with those from the mound surface (B-263420 and AA-83903). Consequently, we interpret the feast and resultant deposit (stratum 2) as the first event in the complex construction sequence of the earthwork.

The formation of strata 2 and 4 in Trench 1 is associated with the preceding intensive occupation; however, we suspect the postholes (features 2-5) excavated into stratum 4 are related to mound building. The postholes in Trench 1 are unlikely to have been part of a domestic structure because of the spacing and size of the posts (~30 cm diameter). In this respect, they closely resemble the timber circles documented at the Poverty Point site (Haag 1990; Hargrave *et al.* 2021).

Figure 3.9: Plan view of stratum 2 in unit J103 (Mound X) showing animal bones, PPOs, PPO fragments, and scattered charcoal.

Phase 4: Post-Flood Occupation

Start: *3245-2455* cal yr BP | End: *2705-2100* cal yr BP (2 σ)

Start: *2860-2530* cal yr BP | End: *2665-2390* cal yr BP (1 σ)

Between ca. *3300* cal yr BP and *2780* cal yr BP, the LMV experienced more frequent and higher intensity flood events linked to global climatic changes and attendant fluvial reorganization of the Mississippi River. The crevasse splay deposit at Jaketown is the result of such fluvial reorganization, probably the shift from the Mississippi stage 2 course to the current stage 1 course (Kidder *et al.* 2018). The post-flood cultural deposits at Jaketown occur on top of the crevasse splay and represent people using a different material culture than the population before the flood.

3.8 Discussion

Our research supports the following historical sequence. People first occupied Jaketown by *4570-3820* cal yr BP (2σ) and probably by *4440-4000* cal yr BP (1σ), well before the initial occupation of Poverty Point at ca. 3600 cal BP. This early community engaged in practices later evident at Poverty Point: utilizing biconical PPOs and nonlocal novaculite, the latter connecting them to the Ouachita Mountains in west-central Arkansas ca. 280 kilometers away from Jaketown. Long-distance lithic exchange was rare before the peak of the Poverty Point site (Gibson 1994a), suggesting that this context is an early manifestation of exchanges that later become socially significant in the region.

The occupation became more intensive and extensive by *3585-3395* cal yr BP (2σ) and probably by *3505-3425* cal yr BP (1σ). This phase is represented by deeper middens, ubiquitous postholes, and other features on the bank of Wasp Lake and by the substantial amount of midden mined and used as mound fill in the subsequent earthwork construction phase. During the intensive phase, people at Jaketown were acquiring nonlocal lithics, including soapstone originating in southern Appalachia (Gibson 1994b) by ca. 3500 cal yr BP.

Mound building began at Jaketown by *3425-3365* cal yr BP (2σ) and probably by *3405-3375* cal yr BP (1σ), a century or so before the construction of Mound A and the ridges at Poverty Point (Kidder *et al.* 2021; Ortmann and Kidder 2013: 74-75). Thus, the revival of earthen monumentality in the LMV after a millennium-long hiatus is not necessarily linked to the creation of the monumental earthwork complex at Poverty Point. Rapid earthwork construction at both Jaketown and Poverty Point suggests similar methods of construction. Large postholes documented in Trench 1 and Mound X may represent ceremonial infrastructure like the timber circles documented in the plaza at Poverty Point, although the temporal relationship among these features remains unclear. Despite these similarities, the monumental landscape at Poverty Point is unprecedented; the shape, configuration, and enormous scale of the earthworks are novel to Native North America. These unique characteristics reflect the creation of a new corporate identity at Poverty Point comprised of contributions from multiple groups (Sassaman 2005).

3.9 Future Directions

Chronological modeling at Jaketown allows us to study change as a historical process by establishing chronological control over variation in material culture, the presence or absence (*sensu* Feinman & Neitzel 2020) of particular traditions, the pace of occupation and mound building, the consistency of subsistence strategies, and the ebb and flow of exchange networks. This analysis contributes to the growing body of literature focused on moving past categorical schemas and related causal mechanisms in archaeology, including radial diffusion. One way to forward archaeological explanations for cultural phenomena like Poverty Point is to build absolute chronologies at the local scale without perpetuating assumptions inherent in categorical frameworks (e.g., cultural homogeneity, teleology, radial diffusion of traits, etc.) (Pestle *et al.* 2013). Our work at Jaketown is a case study for applying such an approach and demonstrates that we can construct an understanding of cultural change from the bottom up, embracing and documenting variation rather than reifying antiquated taxonomic frameworks. Moreover, our work shows that this approach changes regional histories dramatically.

3.10 Conclusion

Uncritical use of "heuristic crutches" (Holland-Lulewicz 2021), radial diffusion included, results in the perpetuation of empirically inaccurate interpretations. In the case of Poverty Point, assuming traits diffused from the type site obscures a regional history in which diverse practices arose among communities across the Late Archaic LMV and converged at an important place at a particular historical juncture. Jaketown represents a locus of innovation and tradition ultimately recapitulated at Poverty Point. As such, it is one example of the numerous sites in the LMV where we can document diverse practices present at Poverty Point to varying degrees. These uneven cultural expressions are best conceptualized as individual strands of Native American history (*sensu* Sassaman 2005: 336). Jaketown represents one such strand that, along with others, culminates at Poverty Point rather than radiates out from it.

Despite this new causal understanding, a central question remains: what was the relationship between the convergence of multiple communities and social structure at Poverty Point? The enormity of earthwork construction at the site suggests some form of organization to direct those efforts, yet there is no obvious evidence of hierarchy. Models of diffusion have historically been employed to assert that external forces are responsible for cultural innovations. When such a model is inverted, as we recommend for Poverty Point, how can we conceptualize innovation and resulting social change? Where does it come from if not a center? These are fundamental anthropological questions that make Poverty Point an area of research on par with other globally renowned sites such as Stonehenge or Göbekli Tepe. There is still much to be learned about Poverty Point and Late Archaic histories in the region. Before we can explain the complexity of social organization and cultural expression evident at Poverty Point, we must put important events, innovations, and key sites in their proper historical order. Part of that process consists of critically examining inherited categorical heuristics and how they continue to bias our interpretations.

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Chapter 4:

Sacred Ballast on a Volatile Landscape: Mound Building as Performance in the 4th Millennium B.P. Lower Mississippi Valley

Seth B. Grooms

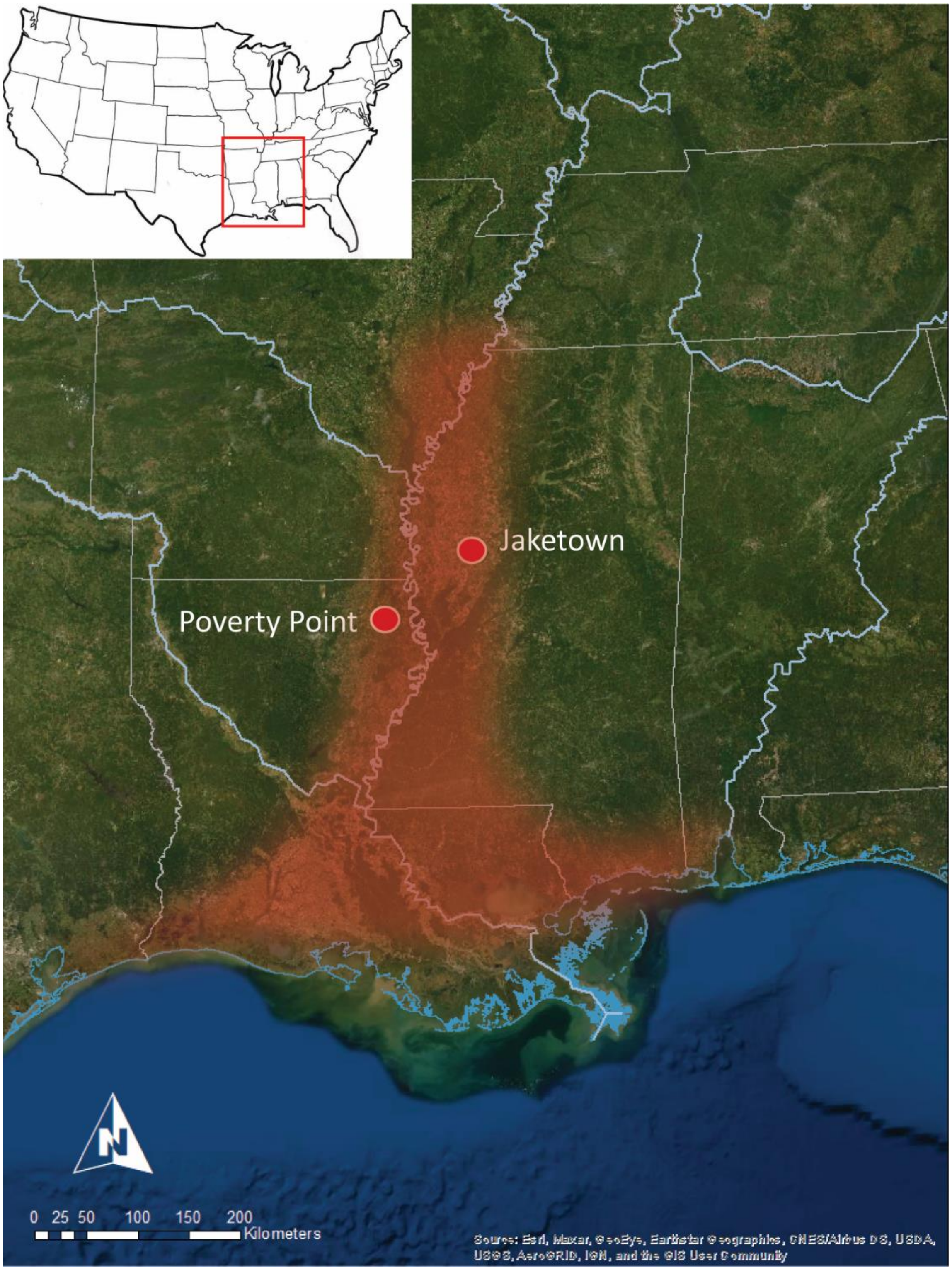
4.1 Abstract

Available evidence suggests that people living in the Lower Mississippi Valley (LMV) during the late fourth millennium BP experienced extreme flooding events precipitated by global climate change, which is reflected by a nearly one-meter-thick alluvial deposit at the Jaketown site. With these paleoenvironmental data in mind, we focus on documenting the social responses to environmental degradation at Jaketown. Drawing on insights from American Indian scholars, I reinterpret the history of mound building at the site as communal performance to restore balance to relations in flux manifest as irregular and high-magnitude floods. Furthermore, I demonstrate that we can "see" performance in archaeological data. From this perspective, it is people, and their traditions, such as mound building and associated rites, which are the loci of social change. Far from epiphenomenal, mounds (and the performance of building them) could bring about change in the world by facilitating communication with agentive, but not necessarily human, persons.

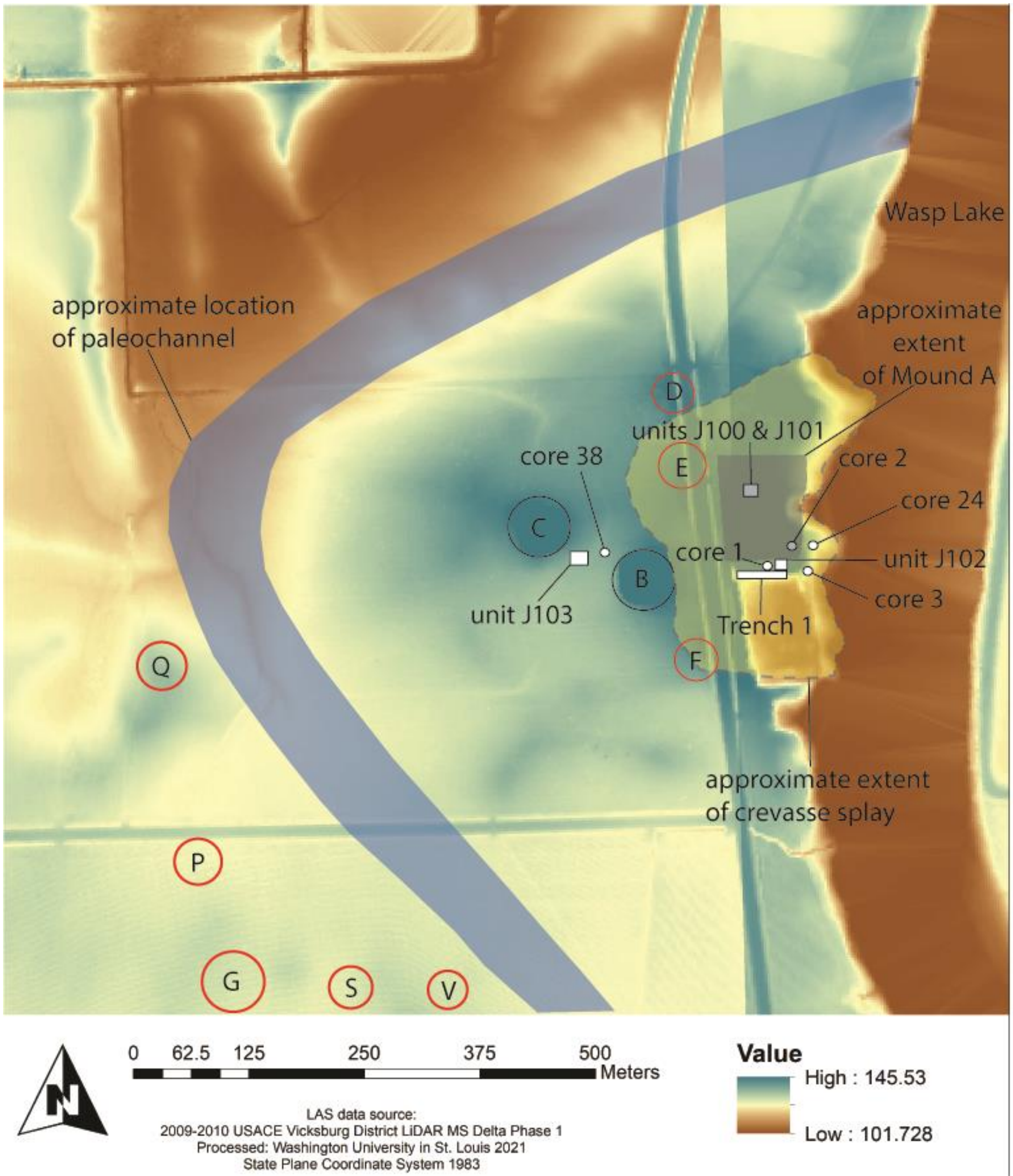
4.2 Introduction

During the late fourth millennium BP, global climatic conditions caused fluvial reorganization throughout much of the Mississippi River drainage catchment, which resulted in more frequent and higher magnitude floods (Adelsberger and Kidder 2007; Kidder 2006, 2010; Kidder et al. 2008, 2010, 2018). People living in the Lower Mississippi Valley at that time experienced unpredictable flood events and catastrophic ecological disruptions (Figure 4.1). At the Jaketown site, this volatility is reflected in a one-meter-thick crevasse splay deposited by a high-energy flood ca. *3300-2780* cal BP (Henry et al. 2017) (Figure 4.2). We have established a high degree of chronostratigraphic control at Jaketown, which allows us to contextualize occupational history with key aspects of geomorphology and flood events (Grooms et al. 2022; Kidder et al. 2018; Ward et al. 2022). While environmental conditions undoubtedly affect communities, they are only half the picture. Having established the environmental context of Late Archaic-era life at Jaketown, we turn our attention to the social context and consider how people responded to environmental instability (Kidder 2010: 24). In North America, the study of Archaic period foragers has been influenced by neo-evolutionary and cultural ecological approaches that often emphasize external factors like environmental conditions when explaining social change. Such approaches treat people's cultural traditions, such as mound building, as epiphenomena—the stuff left over after economic and biological priorities are met within the confines of environmental carrying capacities (Sassaman and Randall 2012: 19; Spivey et al. 2015: 141). Clearly, foraging societies, like any other, are affected by their environment and other biological realities, but culture is just as consequential in effecting the change evident in archaeological data.

Here I present an account of the social response to environmental volatility at Jaketown during the late fourth millennium BP. I interpret the data within a theoretical framework influenced by American Indian scholars and common themes in many Native philosophies and epistemologies. I conclude that the people at Jaketown likely saw themselves as part of an interconnected web of relations and acted in accordance with the belief that individuals and



4.1 The location of the Poverty Point and Jaketown sites. The transparent red shape is the approximate geographic extent of the LMV.



4.2 LiDAR DEM of Jaketown showing excavation areas, relevant cores, and 13 of the 15 mounds. The blue crescent shape marks the approximate location of a paleochannel. Letters circled in black are visible communities had a responsibility to maintain the harmony of those relations. In this sense, mound building and associated activities were a communal response to irregular ecological disruptions they witnessed in a place they knew well. The people at Jaketown built two mounds along with presumably ritual infrastructure (i.e., unusually large wooden post features) quickly and probably simultaneously at ca. 3400 cal yr BP. This burst of activity occurred against the backdrop of environmental disruptions, including irregular floods, and was a communal performance meant to restore balance to relations they perceived to be in flux. When the environmental instability persisted, they carefully decommissioned the site, disengaging with what had become a powerful mounded landscape.

4.3 Some Common Themes in Native American Philosophies and Epistemologies

In the following sections, I introduce the following key concepts found in Native American philosophies: the relational worldview, the importance of balance, the moral imperative to maintain that balance, expansive conceptions of personhood, and the power of performance. It is important to preface this discussion by acknowledging that the lines that demarcate Native American religions, philosophies, and epistemologies are often blurred, making it difficult to distinguish them as separate bodies of thought. American Indian knowledge systems simply do not lend themselves to the neat categorization as Western ones do. The Tewa scholar Gregory Cajete calls the holistic Indigenous pursuit of knowledge Native Science, which he defines as "a broad term that can include metaphysics and philosophy; art and architecture; practical technologies and agriculture; and ritual and ceremony practiced by Indigenous peoples both past and present" (Cajete 2000: 2). Cajete adds that Native Science is "thoroughly wrapped in a blanket of metaphor, expressed in story, art, community, dance, song, ritual, music, astronomical knowledge, and technologies such as hunting, fishing, farming, or healing" (2000:

31). Throughout this paper I use the terms Native philosophies and epistemologies when appropriate, sometimes together and other times separately. In some instances, I will use Cajete's term Native Science when discussing philosophies, epistemologies, and cultural traditions that are otherwise indivisible.

Another important consideration is cultural and intellectual diversity among American Indians. Native American philosophical and epistemological traditions are incredibly diverse. This has always been true and continues to be so. However, just as we can discuss Socrates, Kant, and Latur as Western thinkers, there are recurring themes found across many American Indian philosophies and epistemologies (Cordova 2007: 3); this is evident from the many works by Native scholars that outline common themes in Native American philosophies, epistemologies, and religions (Burkhart 2019; Cordova 2007; Cajete 2000; Deloria Jr. 2003; Fixico 2003; Norton-Smith 2010; Waters 2004). While taking care not to over-generalize in ways that belie the rich cultural and intellectual diversity of American Indian Nations, we can and should engage with Native American scholarship as part of our interpretative frameworks in archaeology (Atalay 2006, 2020; Howey and O'Shea 2006; Henry 2017; Sanger 2021).

Many of the concepts I discuss are not novel; in fact, some overlap significantly with ones derived from Western social theory, especially with anthropological trends comprised in the so-called ontological turn, including new materialisms and related theoretical frameworks that question Cartesian dualities and grant agency to objects, etc. (see Alberti 2016 for review). The argument presented here is not that these ideas are novel but that they are rarely treated as intellectual equals to Western social theorists in anthropological literature (Sanger 2021).

4.3.1 Relatedness and Non-human Persons

American Indian philosophies, epistemologies, and religions are fundamentally relational (Burkhart 2019: xxix; Fixico 2003: 7) and built on a foundation of direct experience in particular places and people's relationships with all life forms (Deloria 2003: 65; Fixico 2003: 47). The idea that humans exist alongside non-human persons is a common premise found in many Native religions (Deloria Jr. 2003: 88). Many Native American scholars describe a universal, animating energy shared by all things, and the physical forms that differentiate a human person from a deer, for example, is simply a different configuration of the shared energy (Cordova 2007: 106, 146). Furthermore, while all things are understood to be *potentially* agentive, not every rock, animal, or landscape feature is (Norton-Smith 2010: 88-89). Anthropologists have traditionally categorized this relational outlook as animism (Tylor [1871] 2010: 10), but this is an oversimplification that belies highly complex social worlds filled with human and nonhuman actors.

Let us consider the importance of relatedness in many Native American traditions by comparing the ontological foundations of Western and Native American worldviews. In Christian traditions, humankind is superior and set apart from nature, which is considered wild, potentially dangerous, and full of insentient, inferior organisms. Worldviews derived from Native Science usually start from an opposite founding assumption: humans live among myriad non-human persons who often have social structures similar to human societies (Cajete 2000: 35; Cordova 2007: 173; Fixico 2003: 44; Norton-Smith 2010: 91). For example, Kimmerer describes the council of pecans (2013: 18) and Deloria Jr. discusses how some Northwest Coast groups regard salmon as a distinct people (2003: 89). Cajete describes this relational outlook as "living in a sea of relationships" (2000: 178). For Fixico, the relationship between humans, plants, and animals is one of mutual respect and coexistence, what he calls Natural Democracy (2003: 53).

One example of the importance of behaving correctly as a node in a dense, interconnected relational web comes from Basso's (1996) work with the White Mountain Apache when Charles Henry, an Apache man, narrates the actions of his ancestors at a spring called Snake's Water. Charles vividly describes a group of his ancestors approaching Snake's Water in search of drinking water when they see several snakes around the spring. The leader of the group approaches the snakes and, in the snake's language, respectfully asks for permission to drink their water (Basso 1996: 15). The snakes were not perceived as an inferior nuisance or a pest to be destroyed; they were relatives deserving respect.

Perhaps most relevant to this discussion are ethnohistoric accounts from the LMV regarding expansive conceptions of personhood among the Choctaw Nation. For the Choctaws, poles served many purposes ranging from representations of clans to the venerated Sacred Pole that led them on their migration from the West to present-day Mississippi. The Sacred Pole was a non-human person who directed the Choctaws towards their new homeland by leaning eastward each day. It was at Nanih Waiya where the Sacred Pole "danced and punched itself deeper into the ground" signifying that the Choctaws had reached their new home (Swanton [1931] 2015: 13).

4.3.2 Balance and the Moral Imperative to Maintain it

Scholars have long recognized order as a central concept in many southeastern Indigenous belief systems (Hudson 1976: 121). In fact, maintaining dynamic balance and harmony is the foundational paradigm of Native Science (Cajete 2000: 73). The concept of order/balance/harmony is often misunderstood as the desire to impose a static, unchanging state in a world deemed inherently chaotic and potentially dangerous. According to Native Science, the whole of creation is good and shares the same animating energy, and consequently, all parts of creation, including humans, must work together to maintain balance (Cajete 2000: 79; Deloria 2003: 80; Fixico 2003: 13). In many Native traditions, the concept of balance/harmony is not about the domination of nature to create an unnatural stillness; instead, achieving balance is about the careful maintenance of an island of motion within a universe defined by perpetual motion (Cordova 2007: 71). Ceremony is the primary method by which a community maintains their relations and balance (Cajete 2000: 70-71), and communities have a moral imperative to maintain balance by behaving correctly towards their relations (Cordova 2007: 175).

4.3.3 The Power of Performance

Performance studies are an interdisciplinary body of research comprised of contributions by anthropologists, philosophers, and playwrights (see Grimes 2004 for a review of performance theory in the study of ritual). Performance theory has been used to understand the central values of a culture (Singer 1955), how ritual performances resolve conflict (Turner 1957), to make religions seem real and gods more tangible (Geertz 1973: 90), and to understand the meaning of everyday social interactions (Goffman 1959: 35). However, the kind of performance I discuss here as it pertains to Native Science is different in that it is a means for creating and maintaining connections between actors in the relational web (Norton-Smith 2010: 97). Native American performance may also act as a moral authority for a community by reminding them of the consequences of treating their relations poorly (Basso 1996: 24; Howe 2014). In this context, performative acts like mound building and associated practices (i.e., dance, song, and prayer) are not dramatic performances meant to convince spectators of a leader's legitimacy or to act as a model for mundane social interactions. Instead, performance in this context is a moral obligation to establish and maintain respectful relationships with others in the relational web.

Performance is useful for conceptualizing mound building because it stresses process over finished form. Performance brings our attention to a particular type of process, inseparable from a relational worldview in which humans are but one of many nodes in a vast and interconnected web. In many American Indian traditions, performance is an epistemological procedure that instructs people about their place in the larger web of relations. In this sense, performances are generative processes that create and maintain social and moral relationships (Norton-Smith 2010: 99). The notion that performances create new realities is not unique to Native worldviews. For example, think of the very real relationship created by the performance of a wedding ceremony (Norton-Smith 2010: 96). What makes performance in the Native American context different is that it is firmly rooted in relational worldviews derived from expansive conceptions of personhood that prioritize balance, and where humans are morally obligated to maintain balance. For example, Dine (Navajo) prayers are understood to be active forces that render effects on the world through their performance and have the potential to establish relationships with nonhuman persons (Gill 1977, 1982: 50-55). According to Dine creation stories, they are responsible for maintaining the world through their prayers, songs, and ceremonies. I do not intend to project specific, localized Dine traditions back to the LMV thousands of years ago. Taking traditions developed in a particular place by a particular people and transplanting them elsewhere would contradict another common premise in Native Science concerning the importance of place in identity and traditions. However, the Dine example is useful as it reflects some common themes in Native philosophies and epistemologies, particularly the moral imperative to maintain order, the expansive conception of personhood, and performance as a means to maintain the world as it should be. Another example of performance comes from Basso's (1996) mapping project with the White Mountain Apache. Simply uttering a place name in Apache is not the same as performing a narrative, a lesson Basso learned when he offended Charles, an experienced Apache place-maker, by stumbling through an Apache place name (1996: 10). Similarly, merely reading a Dine prayer recorded in an ethnography, out of its performative context is largely meaningless. When Charles narrates the actions of his ancestors at various places across the White Mountain Apache homeland, the past becomes indivisible from the present, his ancestors are animated, and moral lessons for the living are activated (1996: 8-30).

Ethnohistoric data pertaining to the Choctaw Nation also speak to the power of performance. After completing Nanih Waiya, the Choctaws erected poles representing each clan and mourned the spirits of their ancestors whose bones were interred in the mound. After performing the “national cry,” they pulled the clan poles and held a celebration that lasted for two days (Swanton [1931] 2015: 20). These performances ensured the prosperity of the Nanih Waiya community by forging harmonious relations with the spirits of their ancestors. There are other ethnohistoric examples of performance among Native peoples outside the LMV, and many involve poles that are either representations of people, such as clans or ancestors, or they were understood to possess personhood, like the Choctaw and Omaha Sacred Poles. The Omaha pole’s name is Umo^{n}'ho^{n}'ti, the "Real Omaha." He is a cottonwood pole, but he is also a person. Another example of performance, also involving poles as persons, comes from late 16th century North Carolina, where the English explorer John White documented Algonquian people dancing around a circle of posts with faces carved into them. The common intersection of poles, expansive conceptions of personhood, and performance is important at Jaketown, where we have documented poles associated with mounds in a manner reminiscent of the ethnohistoric and ethnographic accounts discussed.

Having established that prayers, art, dance, storytelling, and ceremony, are all examples of performance, let us consider how the process of mound building is a performance. According to some contemporary Native mound-building groups, the vitality of mounds continues to be enhanced by communal performance (i.e., by adding soil, songs, and dances) (Miller 2015: 3). Many archaeologists acknowledge the process of mound building (including those comprised of shell) was often more important than the finished form, and in some cases, they are engaging with American Indian traditions to inform their interpretations (Bloch 2019, 2020; Henry 2017; Howey and O'Shea 2006; Kassabaum and Nelson 2016; Kassabaum et al. 2014; Kidder and Sherwood 2017; Mehta and Chamberlain 2018; Pauketat 2007; Sanger 2021). Thinking about the process of building a mound as a communal performance is not only a useful way to interpret the histories of mound sites like Jaketown, but because it is grounded in Native philosophies and epistemologies, it is also more likely to be an accurate reflection of the lived experiences of the people who created the archaeological record at Jaketown.

4.3.4 Mounds as Sacred Ballast and Embodied Performance

Western social theory applied to Native histories, especially concerning Archaic period foraging groups, has traditionally overemphasized the economic, biological, and environmental as loci of social change at the expense of the generative power of culture (Sassaman and Randall 2012: 19). For example, mounds are often interpreted as expressions of political power (Earle 2021: 80; Gibson 2019: 159-160) or as manifestations of deeper, perhaps subconscious, evolutionary imperatives like signaling intergroup cooperation (Miller 2021; Stanish?). In both cases, mounds and mound building are reduced to transactional epiphenomena, arguably representing universal human motives. Theoretical concepts developed in biology have sometimes been used to explain the purpose of mounds. For example, some argue that mound building was a kind of wasteful behavior (Dunnell 1989), energetically speaking, that diverted energy away from reproduction in unpredictable environments, thus increasing the long-term biological fitness of a population (Hamilton 1999). While many archaeologists are increasingly using more humanistic theoretical frameworks to understand mound building, the universalizing explanations of traditions like mound building that are detached from place and history may be one reason many Native Americans find Western academic histories unfamiliar, unanimated, inert, and turgid, it is history without discernable applications (Basso 1996: 33).

Conversely, many Native American traditions understand mounds to embody community-based action (i.e., performance) and as a way to fulfill moral obligations to maintain respectful relations with the whole of creation (Miller 2015: 13). To some, mounds are a form of sacred ballast (Miller 2015: 2), a weighty knot in the relational web made vital by performance (i.e., song, dance, prayer) and metaphor (e.g., soil color symbolism) that transcends the sum of its parts, creating and maintaining relationships, similar to Native American bundles (Henry 2017; Howey and Burg 2021; Sanger 2021; Zedeño 2008). Mounds embody ancient performance and continue to evoke contemporary performance for many Native people (Allen 2022: 328-329; Coke 2006; Mojica 2012). For example, the Choctaw playwright Leanne Howe (2014) describes Mound A (aka Bird Mound) at the Poverty Point site in northeast Louisiana as a cosmic performance of the redtail hawk, noting the that from conception to first flight, it takes about 90 days to make a redtail hawk, the same amount of time it took to construct Mound A (Ortmann and Kidder 2013). For some Native people, mounds themselves are understood to be persons. For example, Allison Hedge Coke, a poet of Cherokee, Huron, and Creek ancestry, wrote *Blood Run* (2006), a compilation of related poems in which earthworks are the narrators and reflect on their creation, eventual destruction, and continued presence: “Present invisibility / need not concern / my weight remains / heavy on this land" (2006: 31). These differences in how we conceptualize mounds and the logic behind their construction are reflected in language. The English language is dependent on static nouns, while most American Indian languages are comprised of active verbs (Cordova 2007: 100). These linguistic foundations frame worldviews such that English-speaking scholars often ask what purpose a mound served in its finished form. Conversely, speakers of Native languages often see the world as dynamic and defined by perpetual motion. These differences result in different conceptualizations of mounds and mound building.

The point here is that the *process* of building mounds was important (Howey and Burg 2021; Sherwood and Kidder 2011; Henry 2017), and by relying on insights from contemporary Native scholars and artists, we can re-conceptualize the generic process as *performance*, the latter emphasizing the ritualistic, pragmatic, and utilitarian nature of mound building. Ritual, pragmatism, and utility may first seem like contradictory terms, but it is important to remember that in many Native traditions, these categories blur into one another in ways that make it difficult to speak of them separately (Cajete 2000). This is why performance is a useful interpretative framing for mound building as a sacred process (i.e., done in coordination with song, dance, and prayer), an epistemological tool (i.e., to learn about your relational web), and utilitarian in the sense that the performance can bring about change in the world (e.g., providing steadying ballast amidst volatility).

4.3.5 Concluding Thoughts on Key Concepts in Native Philosophies and Epistemologies

Native Science is fundamentally relational in that humans are understood to exist in a dense web of relations with other entities and persons, both human and non-human. Furthermore, humans are morally responsible for maintaining the balance of all relations (Cordova 2007: 212-

213). Performances (e.g., ceremony, song, dance, storytelling, mound building) are epistemological tools for people to learn about their relations, and they facilitate communication with their relations to ensure that order is maintained. By acknowledging these foundational ontological similarities across many Native American traditions, it is clear that an overemphasis on paleoenvironmental conditions risks missing the cultural context of how people responded to those changes. The people at Jaketown lived in that place for hundreds, perhaps thousands of years, and noticed the abnormal climatic events reflected in climatic datasets and the stratigraphic record at Jaketown. Moreover, they had epistemological tools for navigating such volatility by facilitating communication with other-than-human persons and entities. Mound building was one such epistemological tool, and the burst of earth moving at ca. 3400 cal yr BP was a communal performance meant to restore balance to a turbulent environment that had become unpredictable. According to available data, the environmental instability continued despite their efforts, and the people at Jaketown removed large posts serving as ritual infrastructure, therefore closing a powerful mounded landscape and decommissioning it in an appropriate manner.

Native scholars are describing the philosophical, epistemological, and religious systems of the diverse nations they represent. We can acknowledge and appreciate the cultural diversity of American Indian Nations today, while also acknowledging the ontological and epistemological foundations they share. Engaging with Native scholarly literature does not replace the need for collaboration with descendant communities. However, it is a first step in acknowledging scholarship that has the same potential as Western social theory to inform archaeological interpretations. I have established some key concepts in Native American philosophies and epistemologies, including the relational worldview, the importance of balance, the moral imperative to maintain that balance, the expansive conception of personhood, and the power of performance. Below, I present data pertaining to the environmental context for mound building at Jaketown.

4.4 Environmental Instability in the LMV

Global climate change altered atmospheric conditions over North America during the mid to late fourth millennium BP, which resulted in increased precipitation throughout most of the Mississippi River basin (Kidder 2006, 2010; Kidder et al. 2008, 2018). The Mississippi River adjusted to the new hydraulic conditions by migrating laterally and capturing the flow of smaller streams and rivers (Saucier 1977, 1994). This fluvial reorganization caused more frequent and higher intensity flood events throughout the Mississippi River valley, causing a cascade of ecological disruptions as large areas were inundated, habits destroyed, and fauna and flora populations displaced. The scale of the floods is evident in sedimentological data from the Orca basin in the Gulf of Mexico that demonstrate multiple megafloods during the Late Archaic period, including one ca. 3500 cal yr BP (Brown et al. 1999; Kidder 2006). Locally in the LMV, data from the nearby Tensas basin southwest of Jaketown reflect high-energy floods in the form of crevasse splays after ca. 3500 cal BP (Adelsberger and Kidder 2007; Arco et al. 2006: Table 1; Kidder et al. 2008). High energy flooding is evident at Jaketown from a meter-thick crevasse splay deposit that covers most of the eastern portion of the site. Chronological models bracket this flood event at ca. 3300-2700 cal yr BP (Henry et al. 2017; Kidder et al. 2018; Grooms et al. 2022). Out of 25 AMS 14C samples from stratigraphic contexts below the crevasse splay, none are younger than ca. 3400 cal BP and are modeled to *3380-3350* (1 σ) and *3390-3325* (2 σ), meaning the flooding probably began ca. 3400 cal BP (Grooms et al. 2022: Figure 4 and Table S2; Ward et al. 2022 Table 1).

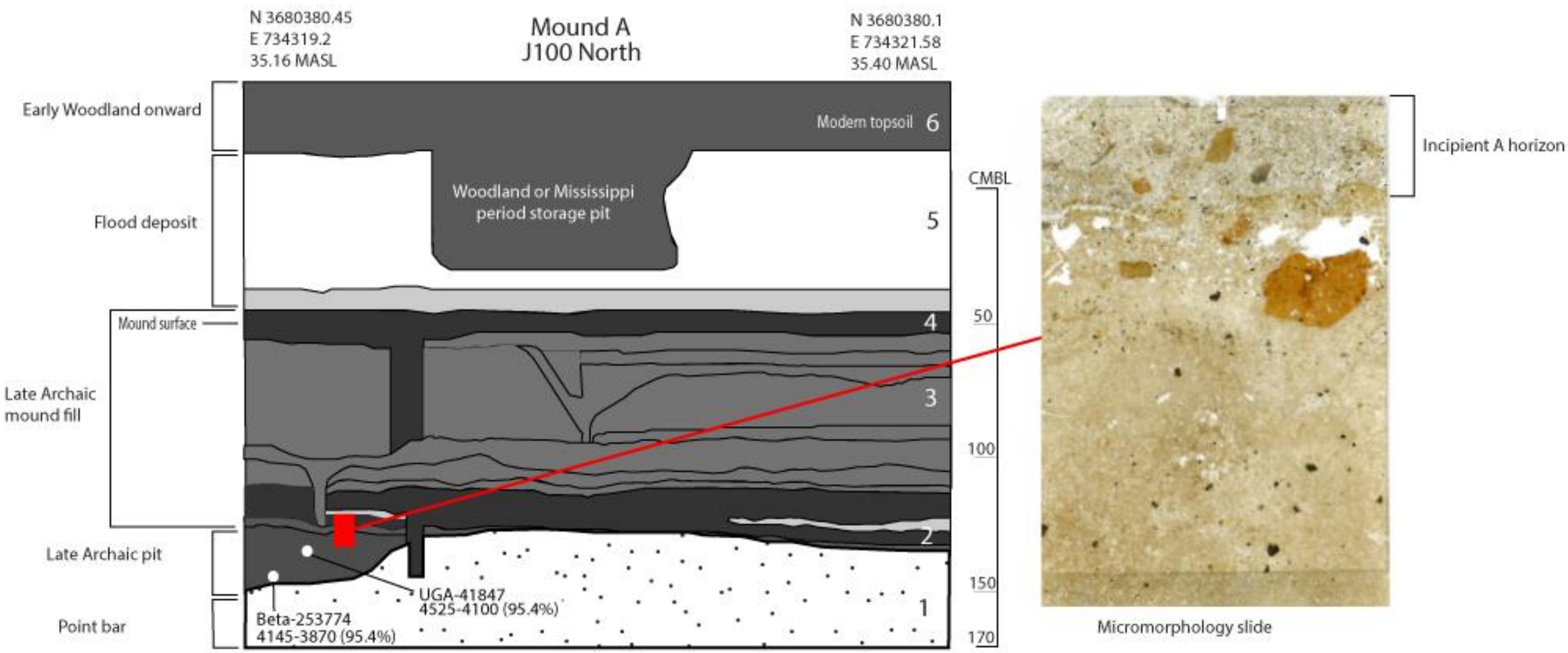
The people living at Jaketown were accustomed to the river's ebb and flow. Living in the LMV in a time before river control infrastructure meant living in a liminal riverine world. According to Native American philosophies, the inhabitants of Jaketown likely perceived the area as being populated by myriad relations, likely including the river itself. All these relations made up a dense web of interdependencies that required maintenance by communities like the one at Jaketown. When the people experienced the dramatic environmental volatility evident in our data, they responded by building Mounds A and X quickly and probably simultaneously. This flurry of earthwork construction can be understood as a communal performance to restore order to a volatile landscape by establishing communication with the relevant actors in their relational web. In the following sections, I present a new interpretation of the history of Jaketown using archaeological, sedimentological, and chronostratigraphic data interpreted within a theoretical framework comprised of insights from Native American philosophies and epistemologies.

4.5 Documenting the Human Response to Environmental Volatility at Jaketown through Performance

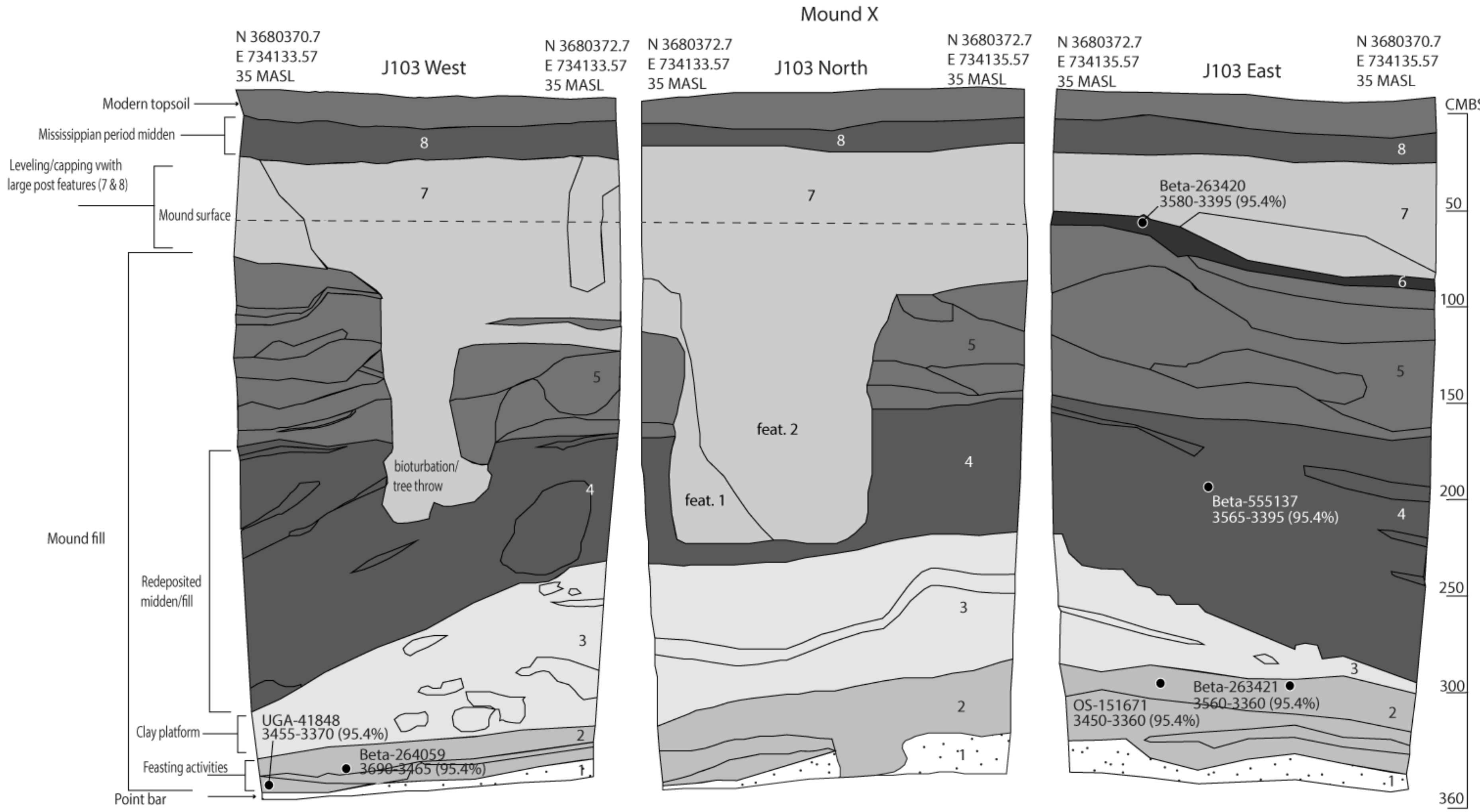
People first occupied Jaketown soon after the Mississippi River shifted from its stage 3 meander belt to its stage 2 course, west of the site (Ford et al. 1955; Saucier 1977, 1994; Kidder et al. 2018). The initial occupation of Jaketown occurred in the context of landscape stability after the establishment of the stage 2 course (Kidder et al. 2018; Grooms et al. 2022). Evidence of this stability consists of occupational residues on a newly developed point bar that were deposited before pedogenesis could occur. The only place where soil formation on the point bar has been documented is beneath Mound A, where an incipient A horizon formed on the point bar and was preserved by the mound. The presence of clean point bar sands beneath the initial occupational deposits demonstrates that people occupied the site soon after the point bar formed, and the incipient A horizon beneath Mound A demonstrates that the point bar was a stable landform (Figure 4.3). From the initial occupation at ca. 4500-4000 cal BP until ca. 3400 cal BP before the burst of earth-moving projects occurred, the occupation of the site became more spatially extensive and intensive (Grooms et al. 2022; Ward et al. 2022). The occupants of Jaketown created deep middens across the site, especially concentrated on the western bank of Wasp Lake (Grooms et al. 2022), they hunted, fished, and gathered plant resources from the area (Ward et al. 2022), and they established trade connections with other groups that resulted in stone being imported from far away (Grooms et al. 2022; Lehmann 1982; Ward et al. 2022). At ca. 3400 cal BP, the site underwent a dramatic transformation as the inhabitants quickly built Mounds A and X.

4.5.1 Building Mound X

They began by holding a feast on the site where the mound would soon be built (Grooms et al. 2022; Ward et al. 2022). The remains of the feast (Mound X stratum 2) were quickly covered by the first mound fill deposit (Mound X stratum 3) (Figure 4.4). Micromorphological analysis of stratum 2 documented the presence of burned bone fragments and dusty clay coatings associated with phosphate nodules, which indicate the burning of organic materials (Figure 4.5; Figure 4.6: slides 5-8). The dusty clay coatings and redoximorphic features around the phosphate nodules are consistent with water being used to distinguish fire. In addition to these findings, there is evidence of raking and trampling, which probably reflect people leveling the area in preparation

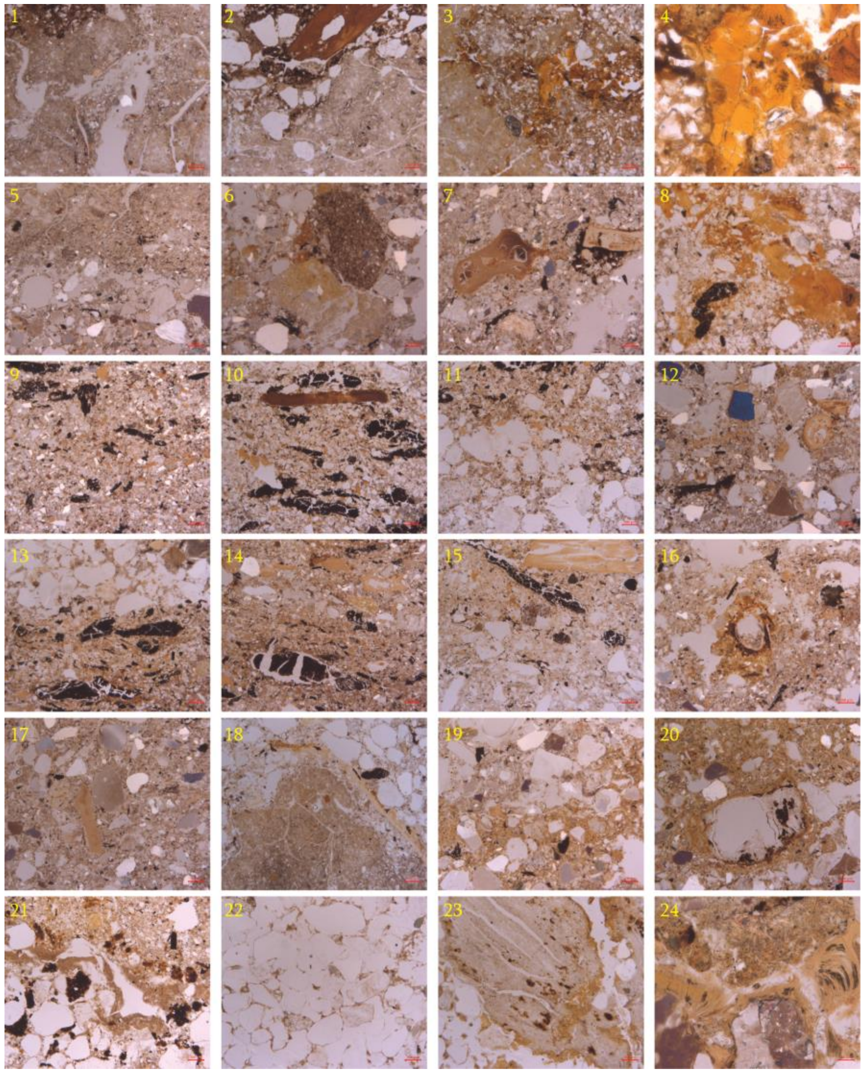


4.3 The north profile of Mound A showing strata (numbers along right side), their descriptions, two AMS 14C samples from the submound pit, and a micromorphological slide and sample location (red) documenting an incipient A horizon above the pit.



4.4 The west, north, and east profiles of unit J103 in Mound X. The dashed portion of the mound surface in the west and north walls is an extrapolation from the preserved mound surface, stratum 6, in the east wall. Numbers represent stratigraphic units.

4.5 West profile of unit J103 in Mound X showing micromorphological sample contexts. Strata I-IV correspond to the micromorph analysis and table, not the stratigraphic units in Figure 4.4.



4.6 1) Limpid clay fragments in clay matrix, XPL; 2) boundary between the rubified sand clast (including a burnt bone) and the clay, PPL; 3) Boundary between silts and clay. Note the phosphate nodules in silt. XPL; 4) Magnified view of phosphates, PPL; 5) Boundary between unit and unit 2, XPL; 6) A clay and a silt nodule with phosphate, XPL; 7) Burnt bones and ash nodules, XPL; 8) Phosphates and charcoal. PPL; 9) Comminuted charcoals and bones, XPL; 10) Horizontally aligned bone fragments and charcoals, PPL; 11) Boundary between unit 2 and unit 1, PPL; 12) Burnt bone fragments and charcoals, XPL; 13) Boundary between unit 2 and unit 3, PPL; 14) Horizontally aligned bone fragment and charcoals, XPL; 15) Boundary between unit 4 and unit 3, PPL; 16) Complex coatings- Fe-Mn coating and phosphate hypocoating on a faunal void, XPL; 17) A bone fragment, XPL; 18) A fish bone attached to a clay aggregate, PPL; 19) Boundary between unit 1 and unit 2, note the dusty clay infillings on the boundary, XPL; 20) Dissolved carbonate nodules with Fe-Mn staining and clay coating, XPL; 21) Boundary between unit 2 and unit 3, note the difference in grain size, and the continuous dusty clay coatings on the void, PPL; 22) The sand matrix with thin clay coating, PPL; 23) Phosphate-rich (especially on the rims) clay aggregate with internal fractures. PPL; 24) Magnified view of the phosphates with acicular fabric, XPL.

for the first mound deposit (Mound X stratum 3). There was no evidence of weathering in stratum 2. In fact, there is no micromorphological evidence to suggest the surface was exposed long enough to be rained on. These data are consistent with our initial interpretation of a feasting event followed by rapid mound construction based on stratigraphic and sedimentological observations, faunal and paleoethnobotanical data, and the large PPO deposit in stratum 2 (for a detailed analysis, see Appendix B).

Mound X stratum 3 is a light-colored (2.5 Y 5/3, 5/4; light olive brown) clay platform that served as the first mound deposit (Figure 4.7). The striking sequence of color contrasts beginning with the dark, organically enriched feasting stratum 2, the light clay platform stratum 3, then the dark stratum 4, was probably symbolically important and related to the metaphorical use of light and dark colors documented among many Native groups, especially in the Southeast (Cobb and Drake 2008; Deboer 2005; Hudson 1976; Sherwood and Kidder 2011). The abrupt stratigraphic boundary between strata 2 and 3, in addition to the micromorphological evidence, indicates that the feasting deposit was covered quickly. Additionally, the weight of stratum 3 deformed the damp and malleable stratum 2 producing the undulating stratigraphic boundary, lending further support for rapid burial. The rest of mound X was built quickly, and 14C dates from stratum 2 overlap with those from the mound surface (Table 4.1). Once the mound was completed, two large (~90 cm wide) posts were installed on the summit. The two postholes (features 1 and 2 in Figure 4.4) overlap, suggesting a sequence of installation, removal, and reinstallation. The feasting event evident from stratum 2, rapid earthwork construction, and the installation of large posts on the mound summit all reflect communal performance against a backdrop of environmental instability leading up to the catastrophic flood that would create the crevasse splay.

4.7 The east profile of Mound X showing color contrast in mound fill packages. Strata numbers correlate with those in Figure 4.4.

Table 4.1 14C dates from Jaketown.

Lab No.	Method	Provenience	Context	Material	13c/12c ratio	Con. RC age (yr BP)	2σ (cal yr BP)	Probablity under distribution (%)	2σ date range (yr BP)	Source
OS-159306	AMS	Trench 1 N Profile	stratum 3	nut shell (Carya)	n/a	3190± 20	3450-3370	95.4	3450-3370	Ward et al. 2021
OS-160358	AMS	Trench 1 N Profile	stratum 5	nut shell (Carya)	n/a	3160± 20	3450-3350	95.4	3450-3350	Ward et al. 2021
OS-159311	AMS	Trench 1 N Profile	stratum 5	nut shell (Carya)	n/a	5290± 35	6190-5985 5970-5940	89.3 6.2	6190-5940	Ward et al. 2021
B-252853	AMS	J100 S Profile (MD-A)	EW midden, above crevasse deposit	UID wood charcoal	-24.5 ‰	2440± 50	2710-2625 2620-2350	22.3 73.2	2710-2350	Kidder et al. 2018
B-253789	AMS	J100 S Profile (MD-A)	Below crevasse deposit; upper PP midden on top of md construc	UID wood charcoal	n/a	3120± 40	3445-3420 3410-3220	4.3 91.1	3445-3220	Kidder et al. 2018

			tion fill							
UGA-38993	AMS	J100 E Profile (MD-A)	stratum 17; upper PP surface below crevasse	Seed (Diospyros virginiana)	-25.94 ‰	3110±20	3385-3320 3305-3245	55.6 39.8	3385-3245	Ward et al. 2021
B-252854	AMS	J100 S Profile (MD-A)	Upper portion of Basal PP midden; below PP mound construction	UID wood charcoal	-26.5 ‰	3220±40	3560-3530 3495-3360	3.1 92.3	3560-3360	Kidder et al. 2018
UGA-38992	AMS	J100 E Profile (MD-A)	Basal PP midden stratum 9	Seed (Diospyros virginiana)	ₒ-25.48	3150±20	3445-3420 3415-3335 3285-3270	11.2 81.3 2.9	3445-3270	Ward et al. 2021
UGA-38991	AMS	J100 E Profile (MD-A)	Basal PP midden stratum 5	Seed (Diospyros virginiana)	-25.33	3150±20	3445-3420 3415-3335 3285-3270	11.2 81.3 2.9	3445-3270	Ward et al. 2021

B-253774	AMS	J100 N Profile (MD-A)	Pit beneath MD-A; assoc. with PPO (strat. 12)	UID wood charcoal	-27.0 ‰	3660± 40	4145-4125 4095-3870	1.9 93.5	4145-3870	Kidder et al. 2018
UGA-41847	AMS	J100 N Profile (MD-A)	Pit beneath MD-A; assoc. with PPO (strat. 12)	Seed (Diospyros virginiana)	-23.39 ‰	3910± 70	4525-4145 4115-4100	94.9 0.6	4525-4100	Ward et al. 2021
B-263583	AMS	J102 E-F1RC-1 (MD-A)	FT.1, EW terahedron-filled pit excavated into upper surface of crevasse deposit	UID wood charcoal	-27.0 ‰	2570± 40	2760-2685 2645-2610 2600-2495	56.1 10.6 28.8	2760-2495	Kidder et al. 2018
B-263420	AMS	J103 E Profile EPRC-5 (MD-X)	Below crevasse deposit; upper surfaceof MD-X	UID wood charcoal	-23.7 ‰	3280± 40	3580-3395	95.4	3580-3395	Kidder et al. 2018

B-263421	AMS	J103 E-PRC-9 (MD-X)	Bottom of PP midden	UID wood charcoal	-27.1 ‰	3220± 40	3560-3530 3495-3360	3.1 92.3	3560-3360	Kidder et al. 2018
B-264059	AMS	J103 W-PRC-1 (MD-X)	ca. 353 cmbs, near base of basal PP midden	UID wood charcoal	-23.3 ‰	3340± 40	3690-3660 3645-3465	6.2 89.3	3690-3465	Kidder et al. 2018
UGA-41848	AMS	J103 (MD-X)	from FS#43 in level HH PPO concent ration in SW corner of unit	nut shell (*Carya)*	-24.05 ‰	3200± 25	3455-3370	95.4	3455-3370	Ward et al. 2021
OS-151671	AMS	J103 stratum 2 (MD-X)	Stratum 2 beneath clay core in MD X	Seed (Diospyr os virginian a)	n/a	3170± 20	3450-3360	95.4	3450-3360	Ward et al. 2021
B-555137	AMS	J103 (MD-X)	stratum O, redepos ited midden/ fill	soapsto ne sherd residue	-25.2 ‰	3260± 30	3565-3440 3435-3395	81.6 13.8	3565-3395	Ward et al. 2021

AA-83901	AMS	Core 38C (MD-X)	Between Mounds B & C; near J103 excavation area	UID wood charcoal	-26.4 ‰	3416± 64	3835-3485	95.4	3835-3485	Kidder et al. 2018
AA-83903	AMS	Core 38I (MD-X)	Below crevasse deposit; upper surface of mound	UID wood charcoal	-26.8 ‰	3201± 39	3485-3350	95.4	3485-3350	Kidder et al. 2018
AA-83902	AMS	Core 38F (MD-X)	Upper part of redposited PP midden; possible earthen construction	UID wood charcoal	-25.3 ‰	3585± 40	4065-4045 3990-3820 3795-3765 3755-3720	1.4 85.3 5.2 3.6	4065-3720	Kidder et al. 2018
B-236318	AMS	Core 24 (MD-A?)	Strat. 5, 4Ab; below crevasse deposit; upper surface of PP mound	UID wood charcoal	-25.9 ‰	3170± 40	3465-3330 3290-3260	90.1 5.4	3465-3260	Kidder et al. 2018

B-156646	AMS	Core 2; 3A3b (264–275 cmbs)	From middle of basal PP midden near MD-A area; E of J100 & J101/J102; near Core 24	UID wood charcoal	n/a	3150± 50	3460-3235	95.4	3460-3235	Saunders and Allen 2003
B-235218	AMS	Core 24 (312cmbs)	Strat 21, 14Ab4/15Ab, 33.1 amsl; basal PP midden	UID wood charcoal	-27.3 ‰	3260± 40	3570-3390	95.4	3570-3390	Kidder et al. 2018
B-157421	AMS	Core 3; 3A1b (168–180 cmbs)	From upper portion of basal PP midden; E of Trench 1 and J101/J102	UID wood charcoal	n/a	3350± 40	3690-3655 3650-3465	9.4 86	3690-3465	Saunders and Allen 2003

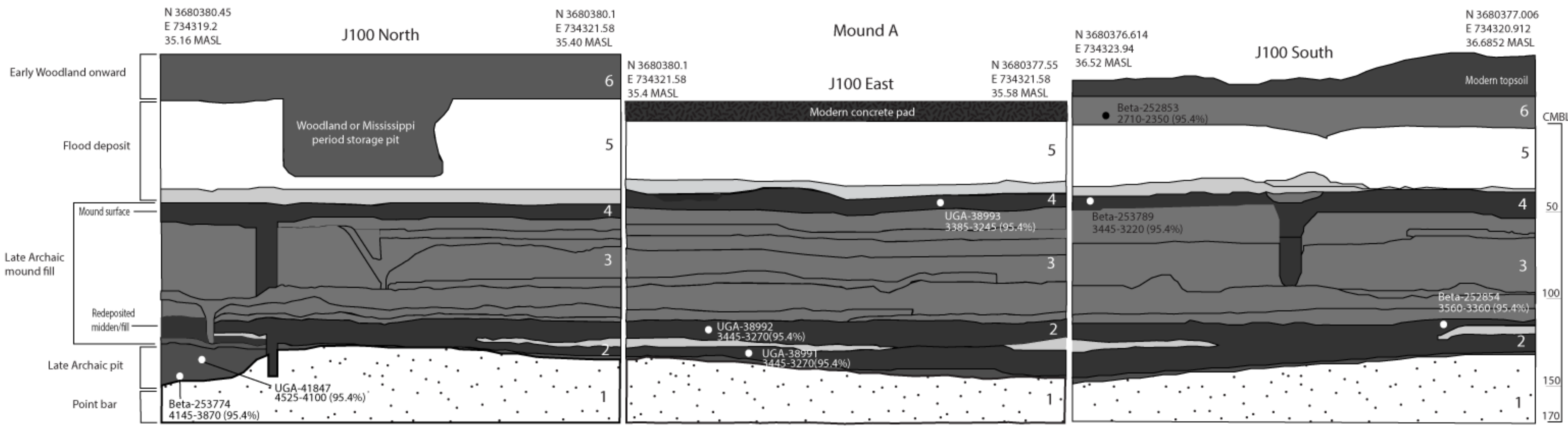
B-154428	Radio metric	Core 1; 2A3b (160–180 cmbs)	From middle of basal PP midden in Mound A area; near J101	organic sediment	n/a	3630±80	4225-4205 4155-3810 3805-3715 3710-3700	0.7 85.6 8.8 0.3	4225-3700	Saunders and Allen 2003
UGA-14091	AMS	Core 1 from Mound C	MD C 2.2-2.4 mbs, Ab1, surface, stage I mound	cane charcoal	n/a	740±40	730-645 585-565	91.0 4.4	730-565	Saunders and Jones 2004: 67-70
M-216	Radio metric	Trench 5 square 0-2, stratum 2 level	"Charcoal from Poverty Point cultural deposits."	charcoal	n/a	2830±300	3820-3795 3725-2300 2230-2180	0.3 94.5 0.7	3820-2180	Ford and Webb 1956: 121
L-114	Radio metric	Mound A	West end of Trench 5, stratum 2 above sand bar	charcoal	n/a	2350±80	2710-2295 2265-2150	81.2 14.3	2710-2150	Ford and Webb 1956: 121

L-115	Radiometric	Mound A	West end of Trench 5, stratum 2 above sand bar		n/a	±				Ford and Webb 1956: 121
O-41	Radiometric	Unknown	"Shell from Poverty Point cultural deposits."	shell	n/a	2560±100	2850-2810 2800-2355	3.3 92.1	2850-2355	Ford and Webb 1956: 121
O-46	Radiometric	Unknown	"Bone from Poverty Point cultural deposits."	bone	n/a	2150±110	2360-1830	95.4	2360-1830	Ford and Webb 1956: 121

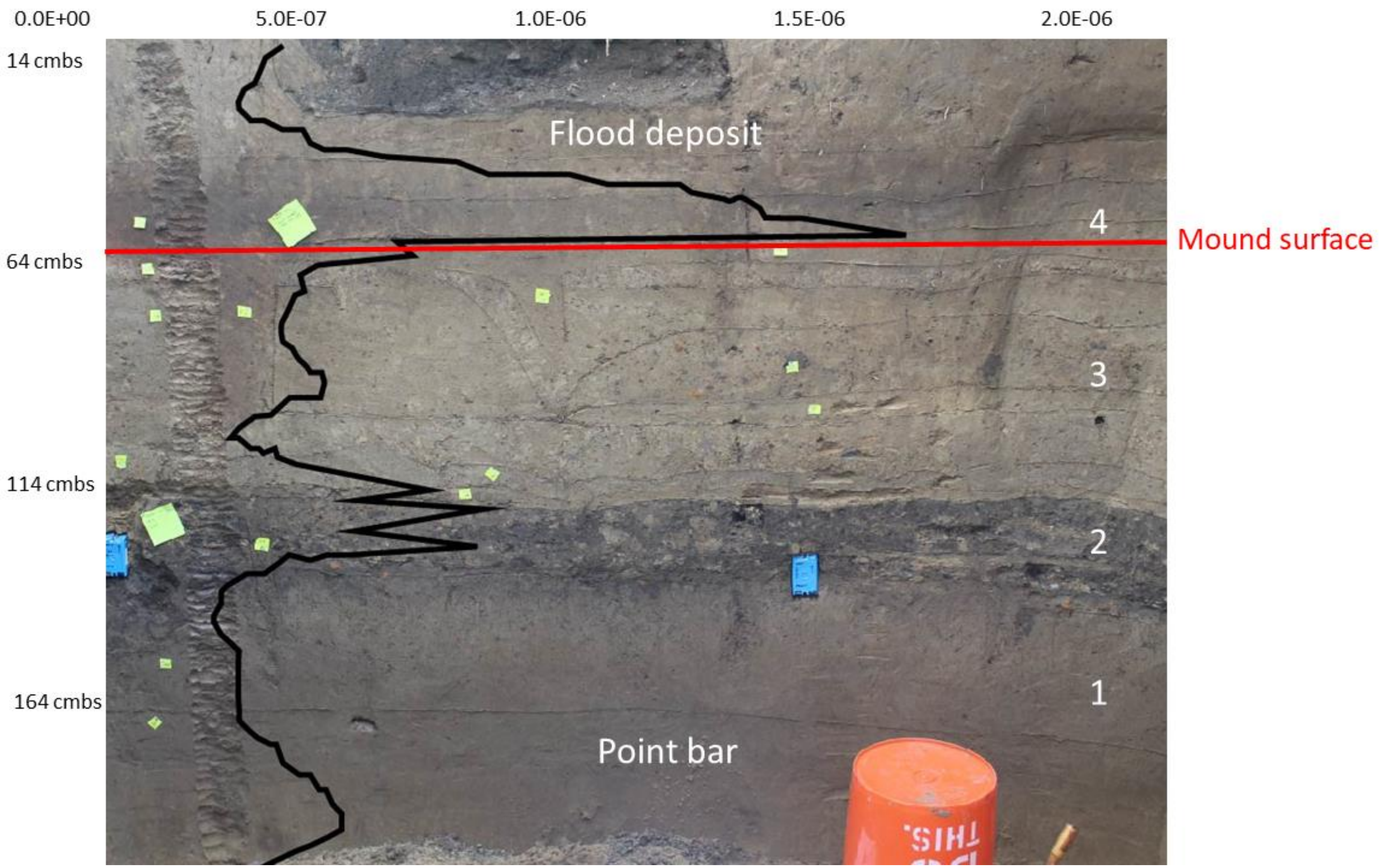
Table 4.1. Calibrations made in OxCal v4.42 (Bronk Ramsey 2020) using IntCal20 calibration curve (Reimer et al. 2020). Dates have been rounded to nearest 5 years.

4.5.2 Building Mound A

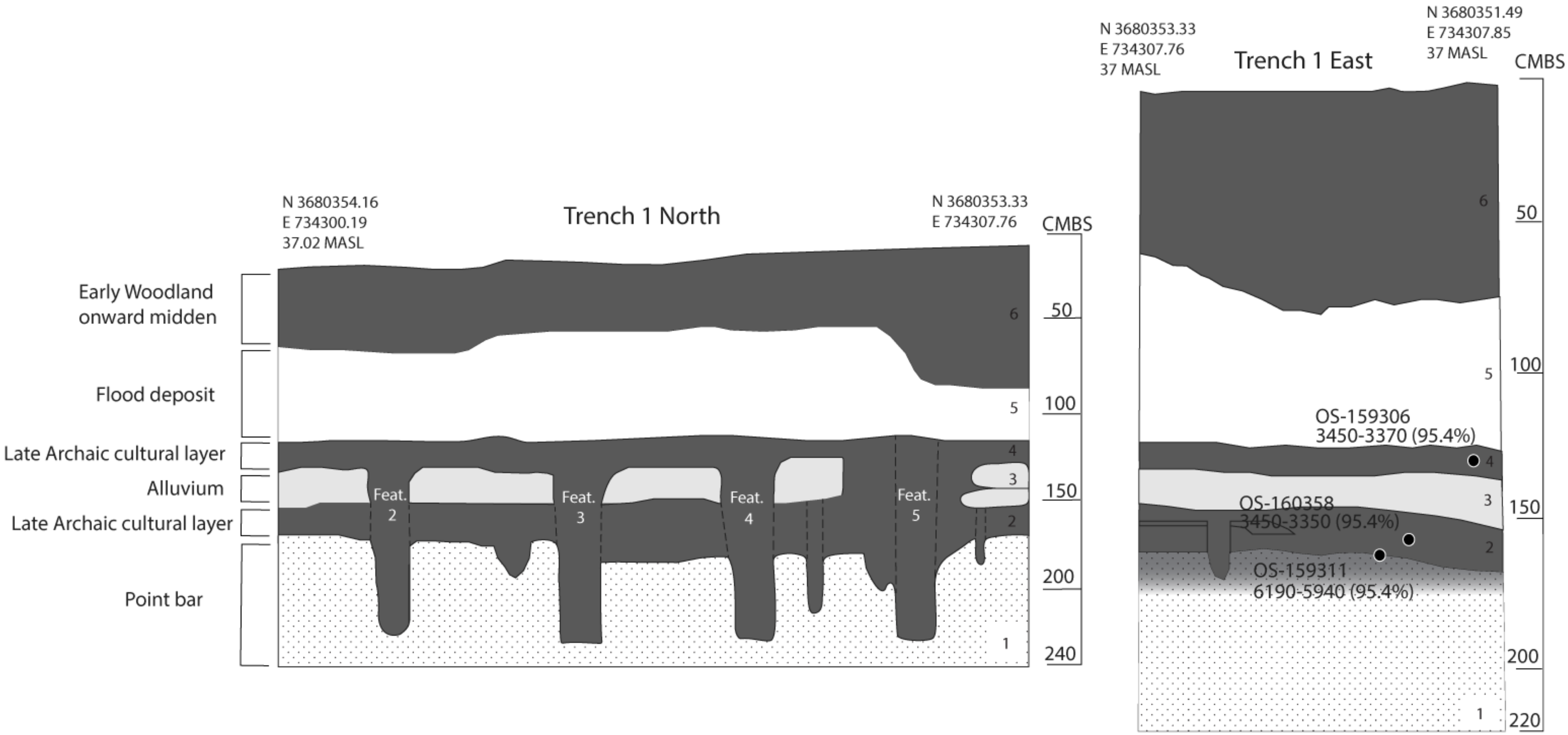
Like Mound X, Mound A was built quickly with very little time transpiring between the first and last mound deposits. There were no signs of weathering, pedogenesis, or organic enrichment from prolonged human activity among any of the fill deposits between the initial one (Mound A stratum 2) and the summit (Mound A stratum 4) (Figure 4.8). Additionally, AMS 14C samples from strata 2 and 4 overlap (Table 4.1), further demonstrating rapid construction. According to magnetic susceptibility analysis, as well as stratigraphic observations in the field, a large fire was lit on the summit of Mound A (Figure 4.9). We documented four large (~30 cm wide) posts in Trench 1 just off the south side of Mound A (Figure 4.10). The postholes represent a different kind of architecture compared to the 3 m^2 diameter, bent pole domestic structure documented by Ford and colleagues beneath Mound A (Ford et al. 1955: 34, Fig. 10). It is likely that the posts in Trench 1 articulate with others outside of the trench to form ritual architecture associated with Mound A, like the timber circles documented at the Poverty Point site (Haag 1990; Hargrave et al. 2021). AMS 14C samples from the lower cultural stratum (Trench 1 stratum 2) and upper cultural stratum (Trench 1 stratum 4) returned dates of 3450-3350 (95.4%) and 3450-3370 (95.4%), respectively (Table 4.1). The middle stratum (Trench 1 stratum 3) was free of cultural material and may be an alluvial deposit, and if so, indicates the area was experiencing irregular, lower-order flood events compared to the one that created stratum 5 during the time the posts were being installed and Mounds A and X were being built. Although we can only be certain that the flood that created the crevasse splay occurred sometime between ca. 3400-2700 cal BP, the fact that seven AMS dates from different contexts directly beneath the crevasse splay all cluster around 3400-3200 cal BP suggests the flood occurred at that time. Chronostratigraphic data demonstrate the construction of Mounds A and X, along with the associated activities (i.e., feasting, installation



4.8 The north, east, and south profiles of unit J100 in Mound A. The numbers along the right side of each profile are stratigraphic units.



4.9 The north profile of unit J100 in Mound A showing magnetic susceptibility data.



4.10 Trench 1 north and east profiles. The numbers along the right side of each profile are stratigraphic units.

of mound summit posts, the installation of the large post architecture near Mound A, and the use of mound summit fires) happened quickly and right before the catastrophic flood that deposited the crevasse splay.

4.5.3 Decommissioning a Powerful Landscape

The mounds at Jaketown were made vital by the performances of the people who built them. Communal performances made Jaketown a revelatory landscape where the people could communicate with other-than-human persons and entities (Deloria Jr. 2003: 67). Places like Jaketown had to be treated the correct way, meaning people did not simply abandon it. The mounded landscape at Jaketown needed to be decommissioned via the same sorts of performances required to create it. We can access some aspects of that decommissioning process in the archaeological record at Jaketown through the removal of mound-related post architecture before the flood. Shortly after Mound X was completed, the large posts on its summit were removed before the earthwork was covered by alluvium (stratum 7 in Figure 4.4). We know the posts were pulled out before the flood because the sediments from the crevasse splay (stratum 7) fill the postholes (features 1 and 2).

Similar to the closure of Mound X, the four posts in Trench 1 that were associated with Mound A were removed. Like the post holes in Mound X, the molds in Trench 1 are filled with alluvium. Stratum 3 is a combination of organically enriched sediments, a byproduct of human activities on the surface, and the initial, coarse, sandy sediments characteristic of a crevasse splay deposit. Chronostratigraphic and sedimentological data demonstrate that people decommissioned what had become a powerful mounded landscape. This closure occurred amidst lower-order, irregular floods, like the one documented in the Mound A stratigraphy, but prior to the catastrophic flood that breached the levee and ultimately inundated the area ca. 3400-3200 cal BP. We know the environmental turbulence persisted despite the people's efforts, and sometime after the closure of Mounds A and X at ca. 3400, probably soon after, a catastrophic flood occurred at Jaketown. It was so energetic that it blew out the natural levee adjacent to Wasp Lake, resulting in the crevasse splay up to 70 cm thick near the source, which covered much of the site. The area was uninhabited for the next 500 years or so before people with different material culture and presumably different histories began sporadically visiting the site, creating archaeological deposits on the top of the crevasse splay beginning ca. 2700 cal BP (Henry et al. 2017; Kidder et al. 2018; Grooms et al. 2022; Ward et al. 2022).

4.6 Discussion and Conclusion

This work has increased our understanding of the cultural response to the environmental degradation documented at the Jaketown site and across the LMV during the late fourth millennium BP. I have shown that by relying on insights from American Indian scholars, we can document performance in our data. Our data demonstrate that people built Mounds A and X rapidly. At Mound X, a feast kicked off an uninterrupted construction sequence. They erected unusually large posts on the summit of Mound X and along the southern flank of Mound A, which also held a large fire on its summit. These performances were a manifestation of a worldview of people who conceived of themselves as part of an interconnected web of relations that required their maintenance (Cajete 2000: 73; Cordova 2007: 188; Norton-Smith 2010: 47). The people, their epistemological tools, rites, and ceremonies are not epiphenomena dictated by their environment, rather, these cultural practices are the catalysts for the social change evident in the archaeological record.

In the past, anthropological explanations for mound building have tended to reduce it to a transaction–it exists to get something else done (Howey and Burg 2021), whether that be to mark territorial boundaries, express chiefly power, signify willingness for intergroup cooperation, or as evolutionary wasteful behavior that ultimately increases the biological fitness of the builders. Conversely, if we let Native American worldviews articulated by American Indian scholars take the lead in our interpretations, as opposed to ethnographic accounts written by Euro-American authors, we may find that these special places, made sacred by prayer, dance, ritual, and mound building (i.e., performance) were places "where revelations were experienced were remembered and set aside as locations where, through rituals and ceremonials, the people could once again communicate with the spirits" (Deloria Jr. 2003: 65-66). We may struggle to explain why people voluntarily built large mounds, but it may have been self-evident to those who built them–those places were sacred enough to warrant their efforts. It may be as simple as that (Howey's response to Miller 2021).

The songs, dances, and prayers that likely accompanied the construction of Mounds A and X are not easily accessible in the archaeological record, but other performances are– for example, the feasting stratum beneath Mound X, the rapid construction of two mounds, symbolic use of soil color, and the installation of large post architecture. The proliferation of archaeological methods is providing the means to see history at an unprecedented resolution. For example, AMS 14C dating and Bayesian modeling software allow us to discern the temporality of events in the archaeological record at the human generational scale (Barrier 2017; Henry et al. 2021; Krus et al. 2019; Grooms et al. 2022; Hadden et al. 2022). Paleoethnobotanical data allow us to reconstruct foodways and can be proxies for resource management practices and paleoenvironments (Ward et al. 2022). Micromorphological data reveal the residues of events so ephemeral they were virtually invisible until the scale of our analysis reached the micron level. For example, we have documented instances of trampling on the surface beneath Mound X, where a feast was held (stratum 2). While it is important to be cautious with our interpretative extrapolations from a few micromorphology slides, it is also reasonable to deduce that the trampling was from people leveling the feast surface and preparing the area for mound construction. The trampling may have even been from dance–the point here is that archaeological methods are increasingly enabling us to access performances in the archaeological record that were once assumed to be lost to time.

Mound building has a 6,000-year-old history in Native North America (Saunders 2010), and according to Native Science (Cajete 2000), the practice sometimes represented an epistemological strategy that enabled people to learn about their place in a sea of relations. Arguably, many archaeological interpretations of mound building epitomize the gulf in worldviews and epistemological values between most anthropologists and many Native Americans. It has been more than twenty years since Roger C. Echo-Hawk, renowned scholar and member of the Pawnee Nation of Oklahoma, challenged archaeologists to shed our prejudices against oral histories and treat them as equals of written documents (Echo-Hawk 2000). This work, while not explicitly based on oral histories, is an attempt to take Native American scholars and philosophies (which often consist of insights derived from oral traditions) seriously as an interpretative equal to Western social theory. This work is not novel in that regard, and many archaeologists recognize the explanatory power of relying on Native American perspectives (i.e., direct collaboration, Native American philosophies and epistemologies, and/or oral histories) in archaeology (Bloch 2019; Cipolla et al. 2019; Henry 2017; Herrmann et al. 2017; Howey; Howey and Burg 2021; Howey and O'Shea 2006; Laluk 2017; Lawres 2017;

Lawres and Sanger 2022; Sanger 2021; Sanger et al. 2021; Wright and Gokee 2021; Zedeno et al. 2021).

After reviewing ethnographic and archaeological sources and consulting descendent communities regarding the meaning of mounds and mound building, linguistic anthropologist Jay Miller claimed that "nowhere outside Native communities is any recognition given to their primary goal as blessed, ballooning ballast weighing on the honored Earth and vitalized by the rhythmic songs and stomps of men and women living in an unsteady world" (Miller 2015: 23). Although Miller largely omitted the progress many archaeologists have made in the ways we conceptualize mounds (Kassabaum 2018), his thesis is still instructive. I hope this work contributes to existing trends in anthropology towards treating American Indian perspectives seriously in accounts of the history of Native North America.

There are risks in overgeneralizing American Indian philosophies, epistemologies, and other traditions. Perhaps the most damaging is that it seems to imply that Native Americans are static and unchanging. However, there are also risks in not engaging the literature produced by Native American scholars that should be treated as intellectual equals to Western social theory (Todd 2016). However, when archaeologists engage with Native American philosophies and epistemologies as theory, we must strike a balance between overgeneralization and articulating real commonalities among culturally and intellectually diverse American Indian groups and scholars. A critique of this work may be that it implies that Native people are mystical paragons who transcend the mundane realities of human existence like the subsistence quest or other biological imperatives–in short, that I have regurgitated the Noble Savage myth wrapped in post-modernist sentiments. This is not my intention. Instead, I have endeavored to listen to Native scholars and use their scholarship as a theoretical framework to interpret an era of Native history, the Archaic period, that has almost always been explained in terms of the mundane (e.g., subsistence, economy, technology, environment, etc.) within an almost exclusively Western theoretical framework while largely ignoring the contributions of American Indian scholars. Ultimately, by drawing on the work of Native scholars, our interpretations of the past are couched within a philosophical and epistemological framework that is more likely to reflect the worldviews of the people who created the archaeological record we study (Sanger 2021).

Contemplating the ontological and epistemological differences between most Western-trained anthropologists and many Native Americans inevitably leads to self-reflection about why anthropologists study what we study, whom we generate knowledge for, and whom it helps–or at least it should. It seems clear to me that our reluctance to look too hard in this existential mirror stems, at least partially, from issues of control. In 1969, Vine Deloria Jr. lamented "the musings of this breed" (i.e., anthropologists) and advised that "they get down from their thrones of authority" and help Indian tribes (p. 100). I don't presume to have helped anyone simply by engaging with the work of Native scholars, and Deloria probably would have categorized this work as "pure" research, which was not a compliment. But taking Native scholars seriously as a source of theory is one small step in producing archaeological narratives that some Native people may find more relevant, or at the very least reflect the humanity of their ancestors.

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Chapter 5: Conclusions

5.1 Introduction

This research contributes to data gaps pertaining to the Poverty Point phenomenon, an important part of the history of Native North America and global hunter-gatherer scholarship. Specifically, a high-resolution chronology of Jaketown, a key site in the Native American history of the LMV. Our chronostratigraphic data demonstrate that some mounds were built very quickly. Mound building techniques could vary from mound to mound, even those that were built simultaneously at the same site. I doubt these differences were meaningless, and they beg additional questions of geotechnical expertise, the use of metaphor through soil color, earthwork function, the importance of the process of building (i.e., performance), and more.

Our revised site chronology allows us to discern the temporality of exchange networks by attaching time to non-local materials. The work also contributes space/time data points for understanding the diachronic development of various traditions in the LMV, like mound building and monumental post architecture. These findings contribute data that are relevant to research regarding the social structure of small-scale societies and the social circumstances of the revival of mound building after more than a millennium-long hiatus. Our findings demonstrate that key practices and traditions, such as PPO use, acquirement of non-local lithics from faraway sources, mound building, and monumental architecture (i.e., large timber posts), have origins outside of the Poverty Point site. These findings do not make Poverty Point any less important. To the contrary, this work builds on the work of generations of scholars and supports what they have suspected all along–the Poverty Point phenomenon was a highly complex and unique moment in Native American history, and we are only scratching the surface in our attempts to understand it. Theoretically, this work offers a case study that contributes to the literature critiquing categorical heuristics, especially culture-history, in archaeology. Furthermore, I have offered an alternative interpretation of the history at Jaketown informed by Native American philosophies and epistemologies.

5.2 Chapter Summaries

In Chapter one, I presented an overview of mound building in the LMV and contextualized the revival of the tradition at the Poverty Point and Jaketown sites. Mound building ebbed and flowed, and sometimes the practice halted for centuries before being revived. The region-wide cessation of mound building ca. 4800 cal BP suggests a causal mechanism powerful enough to affect many communities across different environments. Environmental causes have been sought, but sufficient evidence is lacking, meaning the widespread cessation of mound building was likely due to social and cultural factors. I discussed how the Poverty Point phenomenon has defied easy explanation but continues to garner interest from researchers concerned with broad themes of social complexity, especially complexity exhibited by pre-agrarian, small-scale societies. I argued that some of our terms and explanatory frameworks, such as the Archaic period and the archaeological culture concept, introduce biases in the way we conceptualize social complexity and its many manifestations. The pace and scale of earthwork construction at Poverty Point and Jaketown suggest forms of social organization that contradict traditional anthropological models of hunter-gatherers. Scholars must continue to examine our explanatory frameworks critically and excise the parts that hinder research. I acknowledged the pitfalls of social complexity as a concept in anthropology and its incompatibility with the views articulated by many American Indian scholars. I then presented a literature review of the Poverty Point phenomenon, including the various models advanced to explain the reason for the Poverty Point site. I identified two primary obstacles in understanding the Poverty Point phenomenon: the lack of chronological control both regionally and at the site level and holdovers from antiquated theoretical frameworks that hinder our ability to fully comprehend the social complexity manifest at the Poverty Point site and Jaketown. I outlined important themes that my research addresses and the structure of the dissertation. Finally, I prefaced the ensuing chapters by stating that my interpretations are historical rather than materialist or evolutionary and that I have used insights from American Indian scholars to form my theoretical framework.

In Chapter two, my colleagues and I addressed the detrimental influence of the culture-historical paradigm on regional histories pertaining to the Poverty Point phenomenon. To counter the biases inherent in extant regional histories, we focused on variation in material culture, architecture, and foodways between Jaketown and the Poverty Point site. We found that practices and traditions thought to originate at the type site actually occurred earlier at Jaketown. The findings presented in Chapter two provide a case study for the ways that normative frameworks obscure complex histories and show that the Poverty Point site was not the source of key innovations that define the terminal Late Archaic period.

In Chapter three, my colleagues and I presented a revised AMS 14C chronology of Jaketown, including high-resolution chronostratigraphic data pertaining to mound building. The model, comprised of 26 AMS 14C samples supplemented with traditional archaeological data, allowed us to discern four phases of site occupation at Jaketown: the initial phase, the intensive phase, the earthwork construction phase, and the post-flood phase. We built on our findings from Chapter two by providing highly accurate chronological spans for the variation in material classes and practices documented at Jaketown. The findings presented in this chapter contradict extant regional histories that view Jaketown as a peripheral expression of the Poverty Point culture and the Poverty Point site as an exporter of cultural identity. Based on the revised chronology of Jaketown, we argued that categorical frameworks inherited from the culture-historical paradigm, specifically uncritical reliance on radial diffusion as a causal mechanism, continue to obscure complex regional histories.

After concluding that extant theoretical frameworks are hindering Poverty Point phenomenon research and that low-resolution regional chronologies have enabled the perpetuation of empirically inaccurate assumptions, I presented an alternative interpretation of the history of mound building at Jaketown in Chapter four. I relied on insights from American Indian scholars to identify common themes found in many Native American philosophies and epistemologies and used them as theory to reinterpret the history of mound building at Jaketown. Environmental volatility is well documented across the LMV during the mid to late fourth millennium BP and is reflected at Jaketown by the presence of an approximately one-meter-thick alluvial deposit that seals the Late Archaic Poverty Point component from subsequent occupations. Drawing on insights from Native American scholars, I interpret the burst of mound building at Jaketown ca. 3400 cal BP as a communal performance meant to restore harmony to relations in flux. Further, I demonstrated that ostensibly intangible events like performance are detectable in archaeological data (e.g., AMS 14C dating, artifact analyses, chronological modeling, stratigraphic analyses, magnetic susceptibility analyses, and micromorphology).

5.3 Synthesis

In 2009, Archaic period scholars from across the North American Eastern Woodlands contributed regional summaries to the edited volume Archaic Societies: Diversity and Complexity Across the Midcontinent (Emerson, McElrath, and Fortier, eds. 2009). The editors identified three themes that pervaded all chapters in the book: 1) the importance of relative and absolute chronologies; 2) the question of the meaning of material culture; and 3) the relationships between culture, climate, and landscape (2009: 3). The research presented in this dissertation contributes to all three themes. Our revised AMS 14C chronology of the Jaketown site addresses theme one by contributing an absolute chronology for an important site and makes Jaketown the most well-dated Archaic period site in the LMV. Our revised chronology contributes precise time spans for important practices and innovations. For example, we found that the occupants of Jaketown were acquiring a variety of nonlocal lithics from faraway sources early (ca. 4500 cal BP onward) in the occupational history of the site.

Excavations in the 1950s produced a substantial amount of lithic material and artifacts from the Late Archaic Poverty Point component at Jaketown, but the researchers did not provide much detail on geologic sources for the materials, although much of the lithic material they excavated was clearly coming from elsewhere (Ford et al. 1955). More detailed work focused on lithic provenience and tool manufacture processes was done later, but these data were from surface collections (Lehmann 1982). Finally, excavations by Wash U researchers in the early 2000s produced additional lithic data with chronostratigraphic control. Our revised chronology has allowed us to attach absolute time spans to all lithic data excavated previously. We now know the occupants of Jaketown were maintaining exchange networks well before and during the peak of exchange centered on the Poverty Point site. The lithic source catchment being utilized was geographically expansive and included sources throughout the Ohio River valley, the Ouachita Mountains of west-central Arkansas, the Central Mississippi Valley, especially around modern-day St. Louis, MO, the Mid-south from sources in Tennessee and surroundings states, the piedmont of Georgia, and sources in north Mississippi and east Alabama (Anthony

Ortmann unpublished lithic data). These are critical findings and demonstrate that practices once thought to originate at the Poverty Point site, like long distance acquirement of nonlocal lithics, have older and more varied histories in the region.

Our work presented in Chapter two addresses theme two by documenting similarities and differences in material culture and other practices at Jaketown that are key to understanding the historical circumstances of the Poverty Point phenomenon. In this work, we presented a framework focused on variation in material culture, architecture, and foodways between Jaketown and Poverty Point that are socially meaningful. The research presented in Chapter four addresses theme three by examining the social responses, reflected in mound building, to environmental degradation documented in the region. We know that the environment had destabilized and resulted in more frequent and higher magnitude flooding events around the same time there was a conspicuous flurry of mound building at Jaketown. By relying on insights from American Indian scholars and considering recurring themes found in many Native American philosophies and epistemologies, it is reasonable to deduce that the burst of earth moving ca. 3400 cal BP at Jaketown was a communal response to relations in flux reflected by environmental volatility. The findings presented in Chapter four demonstrate that people, culture, and traditions (i.e., performative mound building, feasting, and related activities) are the catalysts of the social change apparent in the archaeological record rather than external causal factors like environmental degradation alone.

In summary, this collection of research demonstrates that the regional histories that comprise the Late Archaic period Poverty Point phenomenon are complex and variable. Many innovations and attributes documented at the Poverty Point site originated elsewhere in the region and earlier than previously thought. Additionally, our findings support interpretations that situate the Poverty Point site as an endpoint rather than a beginning, where disparate streams of history converged and were reconfigured into a unique and colossal whole. This work also adds to growing trends in North American archaeology that acknowledge Native American philosophies and epistemologies as sources of theory. It is worth repeating that engaging with the works of American Indian scholars is not a substitute for collaboration with descendant communities and Indigenous stakeholders. However, giving credit to American Indian scholars, by engaging with their ideas and citing them extensively is a small step towards ceding at least some intellectual authority to descendants when building narratives of the past. In the absence of knowledgeable Indigenous collaborators, we must exercise extreme caution not to appropriate Native American worldviews and perpetuate the historically one-sided extraction of resources (e.g., data and insights that turn into publications and professional advancement) from people who have been perpetual subjects of academic study but received so little in return. At the same time, I believe archaeologists can and should engage with Native American scholarship as earnestly as we do with other bodies of literature and, further, that there is more common ground and collaborative potential between Western and Native American paradigms than is generally acknowledged (*sensu* Atalay 2012: 27; 2020; Cajete 2000).

5.4 Future Research Directions

Future research on the Late Archaic period and the Poverty Point phenomenon in the LMV will benefit from more AMS 14C dates, chronological modeling, and continued critical reflection on the typological explanatory frameworks (e.g., archaeological cultures and great type sites as centers of radial diffusion) and designations (e.g., the Archaic period) that so many regional histories are built on. American archaeology is still influenced by normative logic inherent to the culture-historical foundations of the discipline. This is especially true of the

Eastern Woodlands. We must continue to critically contemplate the interpretative biases of inherited theoretical frameworks and typological terms. This work demonstrates that the social interactions, innovations, and local histories that comprise the Poverty Point phenomenon are varied and complex and that the Poverty Point culture concept hinders our ability to recognize these variations and complexities in our data. This is not a novel insight. Instead, my work is another contribution to finding a way forward. Our work at Jaketown contributes more empirical clarity and chronological resolution to prior work that has noted the inadequacy of the Poverty Point culture concept and the complexity of the historical processes that culminated in what we call the Poverty Point phenomenon.

Going forward, I plan to replicate my research design at other Poverty Point-affiliated sites in the LMV, including the Poverty Point site. By continuing existing collaborations, we can employ methods from geoarchaeology, paleoethnobotany, and chronological modeling, to historicize the Poverty Point phenomenon and this important part of Native American history. The data produced from such multidisciplinary collaborations lend themselves to the complimentary use of theory derived from the Western paradigm and Native American philosophies and epistemologies. Archaeology is at a point, methodologically and theoretically, where we can begin replacing legacy typologies and teleological frameworks with more historical, fine-grained accounts of ancient social change.

As I previously mentioned, collaboration with descendant communities and stakeholders is important, and the use of Native American worldviews as theory ideally includes collaboration with people knowledgeable about those traditions. I plan to seek out such partnerships and let the needs, concerns, and interests of descendant stakeholders guide our research, from initial design, during fieldwork and publication. There is great potential for such collaborations at the Poverty

Point site. I have been part of such collaborative work and have seen firsthand the value of it. The perspectives, interests, and insights of descendant communities would greatly improve future scholarship regarding the histories comprising the globally important UNESCO World Heritage Poverty Point site. Building the relationships necessary to facilitate collaboration takes a long time and is rarely conducive to the various deadlines and professional milestones in academia (e.g., dissertation work, publication turnarounds, tenure requirements, etc.), but they are worthwhile. I suspect and hope that collaboration between archaeologists and Native American communities and individuals will continue to become more common.

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Appendix A: Model Description and OxCal Codes for Models Presented in Chapter 3

Radiocarbon Dating Methods

There are 32 ^{14}C samples from the Jaketown site (Table S1). Ford and colleagues collected the first ^{14}C samples in the early 1950s (Ford et al. 1955: 154; Ford and Webb 1956: 121). They processed five ^{14}C samples, three on unidentified (UID) composite charcoal, one on unspecified shell, and one on unspecified bone. All five measurements came from Late Archaic period contexts. The range of these samples spans 3820-1830 cal yr BP.

In 2001, Saunders and Allen (2003) processed three ^{14}C samples from three soil cores near the excavations of Ford and colleagues and from similar stratigraphic contexts. Their goal was to test the accuracy of the Ford and colleagues' dates. Two of their dates were on UID charcoal, and the third was from organically enriched sediments. The range of these samples spans 4230-3230 cal yr BP.

In 2004, Saunders and Jones (2004: 67-70) collected a core from Mound C, a large platform mound. They dated a piece of cane charcoal from the core that returned a date of 730-565 cal yr BP (95.4%) and surmised the mound was constructed during the Mississippian period.

We collected the remaining 23 ^{14}C samples from 2007 to 2020. Arco, a former graduate student at Washington University in St. Louis, processed 13 ^{14}C samples during 2007-2009, all on UID wood charcoal. Since 2018, the authors have processed 10 ^{14}C samples and prioritized short-lived species for dating instead of wood charcoal. At Jaketown, we have collected carbon samples from obvious cultural features such as middens, pits, combustion features and at important stratigraphic interfaces such as initial mound fill deposits and mound surfaces. We also collected many carbon samples from paleoethnobotanical flotation samples. No carbon samples were collected during the 2020 field season. We have processed nine ^{14}C samples from short-lived species, five from charred seeds (*Diospyros virginiana*), four from charred nutshell (*Carya*), and one on residue adhering to the interior of a soapstone sherd.

Chronological Modeling Methods

Chronological modeling was done by author Grooms. The model was created using the OxCal 4.4 software (Ramsey 2009a), and the ^{14}C measurements were calibrated using the IntCal20 calibration curve (Reimer et al. 2020). All carbon samples used in the model are from the terrestrial carbon reservoir. There are five iterations of the model (models A-E). We present the results of model E in the paper. Model E is a sequential phase model with four phases of site use (Ramsey 2009a). The CQL code for Model E is provided at the end of this document.

Model Iterations

Model A is a sequential multiphase model that consists of three phases and uses 27 of the 32 ^{14}C samples. We omitted all five of the Ford and colleagues' dates. The model will not run with these dates included because they are so erroneous that the model returns an error message (null distribution). When Ford and colleagues' dates are included in the appropriate phase (initial phase) based on their stratigraphic provenience, they are much younger than the other dates in the same phase as well as those in the subsequent intensive and earthwork construction phases. Because the phases are within a sequence, this incongruity causes the model to fail. A more detailed description of other technical issues with the Ford and colleagues' dates is provided in the omission section. This model lumps all dates from the point bar together into a single phase (initial occupation). The initial occupation in this model begins at ca. 6000 cal yr BP. Such an early start date is the result of including sample 25 which dates to 6190-5940 (95.4%). It is unlikely that a continuous phase of occupation lasted three millennia, so for Model B we divided the dates among two phases, the initial and intensive phases. Splitting the dates between two phases is consistent with the archaeological evidence for more intensive occupation on the bank of Wasp Lake and the thick middens repurposed as mound fill.

Model B is a sequential multiphase model that consists of four phases and uses 27 of the 32 ^{14}C samples. Model B is the same as Model A, except it has four instead of three phases. In Model A, dates from the point bar were lumped together into a single phase (initial occupation). In Model B, they are split into two phases (initial occupation and intensive occupation phases) based on stratigraphic context and age. Like Model A, this model fails to pass the Agreement Index of 60 due to UID wood charcoal samples with poor agreement indices (samples 10, 12, and 21). Because the three problematic dates in Model B are on UID wood charcoal samples we began to consider utilizing a Charcoal Outlier model. However, first, we ran a General Outlier model in the next iteration (Model C).

Model C has the same structure as Model B except it includes a General Outlier model. The outlier results show that samples 12 and 25 are strong outliers at 5/50 and 5/85, respectively. Sample 8 is a slight outlier (5/14) and is on a short-lived material (charred seed; *Diospyros virginiana*).

Model D has the same structure as Models B and C but includes Charcoal and General Outlier models. There are no outliers detected in this iteration.

Model E has the same structure as Models B-D and includes Charcoal and General Outlier models. It comprises 26 of the 32 available ^{14}C samples; it does not include the five Ford et al. samples or sample 25. Sample 8 is a possible outlier (5/22) in this iteration. We chose to keep sample 8 in the model, and our reasons for doing so are provided in the next section. After working through the various iterations of the model, Model E is the best fit between the statistical outlier detection methods and the archaeological knowledge we bring to bear on the context of the samples.

Outlier detection methods

We have 27 AMS dates processed by Saunders and Allen, Saunders and Jones, Arco, and us. The dates are on different materials and were processed at different labs. Consequently, there is potential for outliers. Additionally, our team dated more short-lived species than past analysts, so there is potential for offsets. The charcoal outlier results for Model E indicate there is an offset, -64-1 (68%) and -155-3 (95%), showing the potential for the old wood effect on the UID wood charcoal samples. In OxCal, models are assessed by using either the Agreement Index method or the outlier detection methods outlined by Ramsey (2009b). We opted to use General and Charcoal outlier models. 1 in 20 dates are outliers of some kind, so for the General Outlier model, we began by defining the prior odds of any sample being an outlier at 5%. Once the model is completed, dates with a posterior outlier value higher than 5% should be analyzed closer and considered for omission. All wood charcoal samples are expected to be outliers because they date earlier than the archaeological context in which they are found. Therefore, when using a Charcoal Outlier model, we gave each UID charcoal sample a prior outlier probability of 100% (Ramsey 2009b: 1028). When using the outlier models described by Christen (1994) and Ramsey (2009b: 1024), the Agreement Index is no longer the standard for identifying outliers, and the outlier model results should be consulted. In the case of our primary model, Model E, the Agreement Index is irrelevant, although it still surpasses the required 60% threshold.

Reasoning for Omissions

We omitted six ^{14}C measurements from Model E, one AMS date (sample 25), and all five of the Ford and colleagues' radiometric dates (samples 27, 28, 29, 30, and 32). Ford and colleagues sent samples to three different radiocarbon laboratories, none of which exist today. The provenience for these samples is poor, and the three UID charcoal samples are composite samples rather than single-entity samples. Composite samples are a conglomerate of many different and potentially unrelated bits of charred material (Bayliss 2015: 688). In all cases, the laboratories involved used standards and procedures that are unacceptable today. Hamilton and Krus (2018: 12) argue against rejecting legacy dates based solely on large error ranges. They advise that in cases where legacy dates are questionable due to poor provenience, for example, analysts should cross-check them by re-dating the original materials or by dating contemporaneous material. We cannot re-date the original materials, but Saunders and Allen (2003) re-dated similar archaeological contexts with the explicit goal of testing the accuracy of the Ford and colleagues' dates. Their four ^{14}C dates produced an earlier and tighter age span (4230-3230 vs. 3820-1830 cal yr BP). Furthermore, all dates gathered since the Ford and colleagues' dates (n=27) produce a similar age span as Saunders' and Allen's assays and form a coherent dataset demonstrating that the legacy dates are erroneous. Consequently, these samples are not useful and were omitted from our model.

Sample 25 came from stratum 2 in Trench 1 and returned a date of 6190-5940 cal yr BP (95.4%). We processed a second carbon sample, sample 31, from stratum 2 to test the accuracy of such an early date. Sample 31 returned a date of 3450-3350 cal yr BP (95.4%). The ca. 3400 cal yr BP date is consistent with our ^{14}C database and leads us to suspect that the ca. 6000 cal yr BP date is dating the paleosol, a buried A horizon formed on the point bar and below the anthropogenic sediments. Therefore, sample 25 does not date the event in question, the initial occupation of the point bar, but likely dates the formation of the buried A horizon.

Sample 8 is the oldest date from the pit beneath Mound A, and in Model E it has a 5/22 outlier value. The point at which we begin to remove dates has an element of subjectivity, and we are confident in the archaeological context of this sample. 5/22 is a relatively low outlier value, and based on what we know about the context, we decided to leave the date. Christen (1994: 499; Table 3) rejected two samples with >40% values but left the two with 24% and 25% values. Furthermore, even if we omitted sample 8, the pit context still dates to ca. 4000 cal yr BP based on sample 7 from the same feature, and the basal midden on the bank of Wasp Lake dates to 4145-3870 cal yr BP (95.4%). Therefore, if we were to err on the side of caution and omit sample 8, we are still confident that the initial occupation of Jaketown was underway by ca. 4000 cal yr BP.

Notes on Certain Sample Contexts and Decisions Made

It is important that analysts provide insights into decisions they made while constructing chronological models. Here we describe challenging decisions regarding the placement of samples that required a combination of subjectivity and archaeological contextual knowledge. The reason for our placement of most samples in their respective phases is sufficiently evident from the information provided in Table S1. Below is a discussion of specific samples and contexts we feel need to be discussed in more detail than the table allows.

The Point Bar

The basal sandy point bar at Jaketown is a time-transgressive paleosurface. It supported both the initial and intensive occupations, so it is difficult to discern which phase some dates belong to based solely on their occurrence on the point bar. For this reason, it is necessary to split some dates into different phases even though they come from the same surface. For example, samples 22 and 23 come from a midden on top of the point bar, but sample 23 is older than sample 22. Sample 23 dates to 4225-3700 ca yrl BP (95.4%), while 22 dates to 3690-3465 cal yr BP (95.4%). Furthermore, sample 23 is from organic sediments, which means there is a higher potential for contamination from younger carbon sources such as rootlets and humic acids (Saunders and Allen 2003: 161-162). Consequently, sample 23 may be even older than the AMS measurement. Such temporal differences between samples from the point bar mean they are unlikely the result of one continuous occupation. Therefore, we divided some dates among the initial and intensive phases based on age. In Model A, we tested if lumping all the point bar dates into a single phase produced an appreciably different chronology compared to the iterations that split those dates into two phases (initial and intensive) and it did not.

The Mound A Area

Saunders and Allen's samples 20 and 22 come from similar contexts east of Mound A, but they are difficult to place in the model because they are from cores, and the area has not been excavated. We placed sample 22 in the intensive phase, and sample 20 in the earthwork phase based on the stratigraphic details Saunders and Allen provide (2003: 160-163), as well as their ages. We removed these dates altogether to test how much they impacted Model E, and their exclusion had virtually no effect. We feel it is best to include as many available dates as possible.

Sample 22 came from a midden east of Mound A (Saunders and Allen 2003: 161; Figure 6). Sample 22 is from midden (168–180 cmbs) on top of the point bar and from a similar depth and context as our lowest stratum in Trench 1 (stratum 2; 1.7 mbs). Therefore, we interpret sample 22 as coming from the same midden represented by our Trench 1 stratum 2, only further east towards Wasp Lake. The stratigraphic context, along with the date 3690-3465 cal yr BP (95.4%), supports its placement in the intensive phase.

Mound X Contexts

Sample 16 is from core 38c at 3.75 mbs near unit J103. During our reexcavation of J103, we encountered the point bar at approximately 3.6 mbs. We interpret sample 16 as coming from within the point bar while it was still forming. The sample is from a context stratigraphically deeper than stratum 2 beneath Mound X, and indeed, sample 16 returned a date earlier than the dates from stratum 2 above it. For these reasons, as well as the age of the sample, we placed sample 16 in the initial phase.

Sample 18 is from core 38f at 2.18 mbs, near the middle of stratum 4 (midden-fill) in Mound X. We know this midden was mined from an existing occupation area and used as mound fill. This date supports that interpretation since it is older than the dates from stratum 2 beneath the mound (4065-3720 cal yr BP (95.4%)).

Sample 15 is from stratum 4 in Mound X and was processed from residue adhering to the interior of a soapstone vessel sherd. Sample 15 is older (3565-3395 cal yr BP (95.4%)) than the sub-mound dates from stratum 2, thus supporting our interpretation that stratum 4 is redeposited midden that formed during the intensive phase and was gathered and used as mound fill during the earthwork construction phase.

Sample 13 is a charred nutshell (*Carya*) collected via flotation and comes from an in situ PPO concentration in stratum 2 beneath Mound X. Stratum 2 represents the feasting event documented under the first obvious mound fill deposit, stratum 3. Its age (3455-3370 cal yr BP (95.4%)) overlaps with dates from the surface of Mound X (3580-3395 cal yr BP (95.4%)). For these reasons, we have interpreted the feasting event as part of the mound building process and included dates associated with stratum 2 in the Earthwork Construction phase.

Trench 1 Contexts

Sample 24 is from stratum 4 in Trench 1 and dates to 3450-3370 cal yr BP (95.4%), which is slightly older than the beginning of the earthwork construction phase. The intensive and earthwork construction phases probably blurred into each other rather than representing two distinct occupations separated by any appreciable time. However, based on the age and the fact that there is no mound over it, we included this context in the intensive phase.

Sample 31 is from stratum 2 and dates to 3450-3350 cal yr BP (95.4%). This date overlaps with the sample 24 date from stratum 4. Therefore, it is plausible that the intervening stratum was deposited quickly (stratum 3 in figure 6). Whether stratum 3 is an anthropogenic or alluvial deposit is difficult to discern. The stratum was deposited quickly, and it was present only in sections of our Trench 1 reexcavation. One would expect the stratum to be more spatially contiguous if it were an alluvial deposit. However, the depositional history of Jaketown is highly complex. It is the result of millennia of both anthropogenic and alluvial deposition, so more excavation in the Trench 1 area is needed, along with laboratory analyses to clarify the nature of stratum 3.

Model E table view. Calibrations made in OxCal v4.42 (Bronk Ramsey 2020) using IntCal20 calibration curve (Reimer et al. 2020). Dates have been rounded to nearest 5 years.

Name	Unmodelled (BP)							Modelled (BP)							Indices: Amodel 79.3 Aoverall 79.9		
	from	to	%	from	to	%	m	from	to	%	from	to	%	m	A	P	C
R_Date 26. UGA-14091	720	655	68	730	565	95	680	720	655	68	735	565	95	680	101.6	97	99.9
Boundary End 4								2665	2385	68	2705	2100	95	2490			99.2
R_Date 1. B-252853	2695	2360	68	2710	2350	95	2510	2695	2505	68	2710	2355	95	2585	94.3		99.9
R_Date 9. B-263583	2755	2540	68	2760	2495	95	2710	2735	2510	68	2745	2435	95	2620	97.7		99.9
Phase Post Flood Occupation																	
Boundary Start 4								2865	2535	68	3245	2455	95	2725			99.8
Boundary End 3								3380	3350	68	3390	3325	95	3365			99.9
R_Date 13. UGA-41848	3450	3390	68	3455	3370	95	3415	3390	3370	68	3410	3360	95	3380	62.6	97	100
R_Date 2. B-253789	3390	3255	68	3445	3220	95	3340	3390	3360	68	3405	3340	95	3375	73.5		100
R_Date 3. UGA-38993	3370	3265	68	3385	3245	95	3335	3385	3360	68	3395	3345	95	3370	73.9	96	100
R_Date 10. B-263420	3560	3450	68	3580	3395	95	3500	3395	3365	68	3415	3350	95	3380	83.4		100
R_Date 17. AA-83903	3455	3385	68	3485	3350	95	3420	3390	3360	68	3410	3345	95	3375	111		100
R_Date 19. B-236318	3450	3360	68	3465	3260	95	3395	3390	3360	68	3410	3345	95	3375	117.9		100
R_Date 14. OS-151671	3445	3370	68	3450	3360	95	3395	3390	3365	68	3405	3360	95	3380	118.1	98	100
R_Date 4. B-252854	3460	3390	68	3560	3360	95	3430	3390	3360	68	3410	3345	95	3375	110.9		100
R_Date 5. UGA-38992	3400	3355	68	3445	3270	95	3375	3390	3365	68	3400	3355	95	3375	138.5	98	100
R_Date 6. UGA-38991	3400	3355	68	3445	3270	95	3375	3390	3365	68	3400	3355	95	3375	138.5	98	100

R_Date 20. B-156646	3450	3270	68	3460	3235	95	3370	3390	3360	68	3405	3340	95	3375	119.5		100
R_Date 21. B-235218	3560	3405	68	3570	3390	95	3475	3395	3365	68	3410	3350	95	3380	92.3		100
R_Date 11. B-263421	3460	3390	68	3560	3360	95	3430	3390	3360	68	3410	3345	95	3375	110.9		100
R_Date 12. B-264059	3620	3485	68	3690	3465	95	3560	3395	3365	68	3415	3350	95	3380	92.9		100
Phase Earthwork Construction																	
Boundary Start 3								3405	3375	68	3425	3365	95	3390			99.9
Boundary End 2								3440	3400	68	3445	3380	95	3415			100
R_Date 24. OS-159306	3450	3385	68	3450	3370	95	3410	3450	3420	68	3455	3395	95	3435	108.4	97	100
R_Date 31. OS-160358	3440	3360	68	3450	3350	95	3385	3450	3420	68	3450	3385	95	3435	62.7	97	100
R_Date 15. B-555137	3550	3405	68	3565	3395	95	3470	3475	3410	68	3500	3390	95	3450	96.8	97	100
R_Date 22. B-157421	3640	3490	68	3690	3465	95	3575	3475	3415	68	3530	3390	95	3445	94.5		100
Phase Intensive Occupation																	
Boundary Start 2								3505	3425	68	3585	3395	95	3470			99.9
Boundary End 1								3755	3535	68	3820	3460	95	3645			99.9
R_Date 23. B-154428	4085	3840	68	4225	3700	95	3950	4080	3830	68	4150	3720	95	3930	102.8	97	99.8
R_Date 18. AA-83902	3965	3835	68	4065	3720	95	3890	3925	3780	68	3975	3670	95	3845	102.5		99.9
R_Date 16. AA-83901	3820	3565	68	3835	3485	95	3665	3820	3650	68	3875	3545	95	3735	84.6		99.9
R_Date 8. UGA-41847	4425	4185	68	4525	4100	95	4335	4345	3985	68	4425	3730	95	4170	55.8	78	99.6
R_Date 7. B-253774	4085	3905	68	4145	3870	95	3985	4040	3850	68	4080	3750	95	3925	99.1		99.8
Phase Initial Occupation																	
Boundary Start 1								4445	4010	68	4590	3785	95	4235			98.5
Sequence																	
U(0,4)	3.99E-17	4	68	3.99E-17	4	95	2	5.38E-17	3.136	68	5.38E-17	3.724	95	2.012	100		99.2
T(5)	-1.14	1.14	68	-2.65	2.65	95	2.05E-12							-0.33			96.5

Outlier_Model General								-565	60	68	-715	125	95	-10			99.8
U(0,3)	2.21E-17	3	68	2.21E-17	3	95	1.515	1.536	1.857	68	1.32	2.052	95	1.692	100		99.7
Exp(1,-10,0)	-1.24	-0.05	68	-3.19	-0.05	95	-0.74							-0.75			100
Outlier_Model Charcoal								-65	0	68	-160	5	95	-35			100

MODEL E

```
Plot()
 {
Outlier_Model("Charcoal",Exp(1,-10,0),U(0,3),"t");
Outlier_Model("General",T(5),U(0,4),"t");
  Sequence()
  {
   Boundary("Start 1");
   Phase("Initial Occupation")
   {
    R_Date("7. B-253774", 3660, 40)
    {
     Outlier("Charcoal", 1);
    };
    R_Date("8. UGA-41847", 3910, 70)
    {
     Outlier("General", 0.05);
    };
    R_Date("16. AA-83901", 3416, 64)
    {
     Outlier("Charcoal", 1);
    };
    R_Date("18. AA-83902", 3585, 40)
    {
     Outlier("Charcoal", 1);
    };
    R_Date("23. B-154428", 3630, 80)
    {
     Outlier("General", 0.05);
    };
   };
   Boundary("End 1");
   Boundary("Start 2");
   Phase("Intensive Occupation")
   {
    R_Date("22. B-157421", 3350, 40)
    {
     Outlier("Charcoal", 1);
    };
    R_Date("15. B-555137", 3260, 30)
    {
     Outlier("General", 0.05);
    };
    R_Date("31. OS-160358", 3160, 20)
    {
     Outlier("General", 0.05);
    };
    R_Date("24. OS-159306", 3190, 20)
    {
     Outlier("General", 0.05);
    };
   };
   Boundary("End 2");
   Boundary("Start 3");
   Phase("Earthwork Construction")
   {
    R_Date("12. B-264059", 3340, 40)
    {
     Outlier("Charcoal", 1);
    };
    R_Date("11. B-263421", 3220, 40)
    {
     Outlier("Charcoal", 1);
    };
    R_Date("21. B-235218", 3260, 40)
    {
     Outlier("Charcoal", 1);
    };
    R_Date("20. B-156646", 3150, 50)
    {
     Outlier("Charcoal", 1);
    };
    R_Date("6. UGA-38991", 3150, 20)
    {
     Outlier("General", 0.05);
    };
    R_Date("5. UGA-38992", 3150, 20)
    {
     Outlier("General", 0.05);
    };
    R_Date("4. B-252854", 3220, 40)
    {
     Outlier("Charcoal", 1);
    };
    R_Date("14. OS-151671", 3170, 20)
    {
     Outlier("General", 0.05);
    };
```

```
  R_Date("19. B-236318",
3170, 40)
  {
   Outlier("Charcoal", 1);
  };
  R_Date("17. AA-83903",
3201, 39)
  {
   Outlier("Charcoal", 1);
  };
  R_Date("10. B-263420",
3280, 40)
  {
   Outlier("Charcoal", 1);
  };
  R_Date("3. UGA-38993",
3110, 20)
  {
   Outlier("General", 0.05);
  };
  R_Date("2. B-253789 ",
3120, 40)
  {
   Outlier("Charcoal", 1);
  };
  R_Date("13. UGA-41848",
3200, 25)
  {
   Outlier("General", 0.05);
  };
 };
 Boundary("End 3");
 Boundary("Start 4");
 Phase("Post Flood
Occupation")
 {
  R_Date("9. B-263583",
2570, 40)
  {
   Outlier("Charcoal", 1);
  };
  R_Date("1. B-252853",
2440, 50)
  {
   Outlier("Charcoal", 1);
  };
 };
 Boundary("End 4");
 R_Date("26. UGA-14091",
740, 40)
 {
  Outlier("General", 0.05);
 };
};
};
```

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Appendix B: Micromorphological Analysis Discussed in Chapter 4

Microunit interpretations:

Stratum I:

J103#3-①: This unit contains three basic components, clay aggregates, burnt (rubified) sand clasts, and a silt matrix (Figure 2:1, 2, 3). Lineal, banded, and dendric phosphates, and phosphatic nodules fill the intergrain voids or channels. Many of the phosphates include radiating acicular montgomeryites (Figure 2:4) at higher magnification (see Figure 4 in Karkanas and Goldberg, 2018b). Montgomeryites are frequently associated with combustion features and ashes. But they are difficult to distinguish from goethite fibers (see plate 8.9 and plate 8.12 in Stoops, 2020). It could be a mixture of both.

"In any case, it is not possible to unequivocally identify a specific phosphate mineral without the use of additional mineralogical identification techniques (e.g., XRD, FTIR, EDS, WDS)" (Karkanas and Goldberg, 2018b, p332).

Fe-Mn staining almost always appear with the phosphate nodules. Sporadic limpid and dusty clay fragments are found in the silt and clay aggregates, which are inherited from the original sediments. The quartz gains in the silt matrix are angular or subangular, suggesting a different origin from the rounded/subrounded large (~300μm) quartz grains, such as the sand grains in Figure 2:2. Large voids in this unit are left by dissolved carbonates (Karkanas and Goldberg, 2018a, p145; Mallol, et al., 2017, p320), with only a few survived ash nodules. To conclude, the sand clasts are very likely to be remnants of combustions from human activities. The origin of rounded grains is very likely to be alluvial. The clay and silt are mined separately. Well-developed pedality and reduced color of clay aggregates indicate an underwater origin, while the silt resembles loess. These three sources are randomly dumped together without compaction.

The spongy microstructure and chaotic fabric attest to the dumping deposition, which is characteristic of mound construction fills. Weathering is mostly chemical, including calcitic dissolution and redoximorphic features. The chemical weathering implies the sediments were still damp during deposition, which does not require long time exposure. In fact, the clear boundaries between aggregates and the lack of *in situ* clay features indicate quick burial or construction.

Stratum II:

J103#3-②: This unit is more homogeneous in composition, mostly silt-sized rake-out deposits from combustion features (Figure 2:5, 6, 7, 8). But it does contain one or two burnt sandy clasts and clay aggregates. It includes more charcoals, bone fragments (many show evidence of burning, such as Figure 2:7), and amorphous phosphate nodules than unit ①. The lack of reduced clay and more burnt materials give this unit a darker color than unit ①, which is conspicuous in the profile photo and macro scanning of the slide. Less voids in this unit and better-preserved ash nodules indicate a drier condition than unit ①. Thus, the moisture in unit ① could attribute to the clay. Dusty clay fragments/coatings are more clearly associated with the phosphate nodules in this unit. These phosphate nodules are products of burning organic materials, most likely meat and bones (a barbeque?). The dusty clay fragments/coatings can be formed when people use water to extinguish fires. The water also causes localized redoximorphic conditions around the phosphate nodules, which explains why Fe-Mn staining appears with the phosphates.

In raking, different size of particles are mixed chaotically, resulting in an almost granular microstructure of this unit with packing voids. Faintly inclined bands of charcoals and phosphates, and some vertically oriented bone fragments indicate secondary dumping. Again, no post-depositional weathering is found. Because this is redeposited combustion sediment with abundant ash, it is assumed to be soft and easily distorted by heavy clay construction fills, which explains the undulating boundary with Stratum I.

J103#2-① and ③: These two units are nearly identical in composition and microstructure (Figure 2:9, 10, 13, 14). But unit ③ contains more carbonates and ash nodules than unit ①, thus leaves more voids after calcitic dissolution. Compare to J103#3-②, the major characteristics of these units are finer particle sizes (silt- and fine sand size) and horizontal distribution of inclusions, such as abundant charcoals and bone fragments. Phosphates are absent. Their origin is still swept and raked sediments from combustion features.

The relatively well sorted particle size and horizontal distribution pattern suggest the sediments were transported or at least sorted by wind.

J103#2-②: This unit is very similar to J103#3-② except being sandier. However, this unit contains no phosphate nodules, less burnt bone fragments and charcoals. It also contains two clay aggregates and a silt clast (Figure 2:11, 12, 13).

<u>Stratum III:</u>

J103#2-④: This unit (Figure 2:15) is more similar to J103#3-② than J103#2-② is, because this unit also contains abundant phosphate nodules. Two cross sections of channels burrowed by soil faunas are found (Figure 2:16). They are coated with Fe-Mn coatings and phosphate hypocoatings. That indicates the combustion feature was on the land surface, where soil faunas live. They are swept/raked out with the other combustion remnants.

J103#1-①: This unit is identical with J103#2-② (Figure 2:17, 18, 19).

J103#1-②: The main difference between unit ① and this unit is the yellow color (Figure 2:19), which is stained by ubiquitous phosphates. The microstructure is almost massive like unit ①. Vughs are caused by dissolved carbonates (Figure 2:20). The horizontal planar void (see macro scanning of the slide) is probably the result of trampling (Karkanas and Goldberg, 2018a, p147).

<u>Stratum IV:</u>

J103#1-③: This unit is very sandy and contains few clay nodules and phosphate nodules (Figure 2:21, 22, 23). Large radiating acicular montgomeryites are observed at higher magnification (Figure 2:24). Again, the mineral could be accompanied by goethite fibers because they are difficult to distinguish and redoximorphic feature and phosphates almost always appear together throughout the slides. The rounded/subrounded quartz grains are suspected to be sand sources in other slides. Sand grains are lightly coated with dusty clay. The boundary between unit ② and unit ③ is filled with dusty clay coating, some of which are laminated (Figure 2:21). These dusty clay coatings/infillings are formed in situ, indicating the sand was the original surface where the combustion occurred. The boundary is also characterized by a continuous Fe-Mn coating, which supports my hypothesis of people using water to extinguish fire. Phosphate nodules in this unit are probably transported downward by trampling (Mallol, et al., 2017).

To answer your mound X questions:

<u>Are there signs of weathering at stratigraphic interfaces in theses slides?</u>

Most strata show no signs of weathering in between, except for the interface between strata III and IV, i.e., between micro unit J103#1-② and J103#1-③. Continuously distributed dusty clay coatings suggest they are formed in situ. That implies the surface of stratum IV (J103#1-③) was the original occupation surface and J103#1-② was the original sediments without secondary movement. Weakly developed intergrain clay coatings suggest that the sandy stratum IV was probably newly formed and not exposed for long.

Were these "sub-mound" strata the result of one event? Multiple? Were they produced quickly? Slowly?

Similar compositions and clear boundaries suggest these deposits were the result of one event. I would suspect the construction followed quickly after the event. They didn't wait until the rain came.

Are these strata *in situ*, i.e., did the activities occur on existing surfaces and were organically enriched in place via cultural activities or were these strata deposited from elsewhere? Are they cultural strata or mound deposits?

As in the answer to your first question, current evidence supports the activity happened on a freshly exposed sandy surface. Only the J103#1-② and J103#1-③ are in situ sediments. Most stratum III, and all stratum II are redeposited combustion features. The bottom of the mound construction fill (stratum I) still contains clasts from the redeposited combustion features, probably accidentally mixed in during sediment preparation.

Are there signs of trampling? Any other indicators that may speak to specific activities?

Yes. Trampling is shown between stratum III and IV. My deduction is that people had a huge barbeque, then extinguished the fire with water, finished with sweeping and raking (probably for leveling the pre-construction surface?). Construction follows rapidly after the activity.

Mound X hypotheses:

I suspect the "sub-mound" deposits are the result of feasting that marked the commencement of mound construction. We have evidence of feasting such as in situ PPO concentrations, animal bones, in these strata.

Current evidence from the three slides supports your hypothesis.

Table Summary of descriptive sediment attributes

field strata	slide/micro-unit	lower boundary	thickness (mm)	c/f ratio (20μm)	sorting	color	related distribution	birefringence fabric	microstructure	inclusions orientation and distribution
West baulk I	J103 #3-①	clear and distinct	38	20/80	moderate	yellowish brown (PPL) brown (XPL)	open porphyric	speckled and random striated	spongy (vugh and chamber 30%)	random
West baulk II	J103 #3-②	/	32	30/70	moderate	yellowish brown (PPL) yellowish grey (XPL)	open porphyric	speckled	granular microstructure	random

	J103 #2-①	diffuse and distinct	19	20/80	moderate	yellowish brown (PPL) brown (XPL)	porphyric	speckled, parallel striated, cross striated	vughy and chamber (5%)	banded, parallel to the boundary
	J103 #2-②	clear and distinct	15	50/50	poor	yellowish brown (PPL) grey (XPL)	close porphyric	speckled	granular microstructure	random
	J103 #2-③	diffuse and faint	10-15	20/80	moderate	yellowish brown (PPL) brown (XPL)	porphyric	speckled, parallel striated, cross striated	vughy and chamber (10%)	banded, parallel to the boundary
West baulk III	J103 #2-④	/	21-26	50/50	poor	yellowish brown (PPL) grey (XPL)	porphyric	speckled	vughy and chamber (10%)	random
	J103 #1-①	clear and distinct	30	50/50	poor	yellowish brown (PPL) grey (XPL)	close porphyric	speckled	massive	random
West baulk IV	J103 #1-②	clear and prominent	10	30/70	moderate	yellow (PPL) yellowish grey	porphyric	speckled, monostriated, granostriated	complex (vughs 5%, planar void 10%)	random or banded; random or

						(XPL)				parallel to the lower boundary
	J103 #1-③	/	30	90/10	well	yellowish brown (PPL) grey (XPL)	gerufic and thin chitonic (80%); porphyric (20%)	speckled	single grain and bridged grain (80%), massive (20%)	random

Table 2 Summary of selected inclusions, and selected post-depositional alterations

field strata	slide/ unit	charcoal	bone	plant residues	carbonate-phosphate nodules	sediment aggregate	Fe/Mn concentrations and coatings	minerals	others
West baulk I	J103#3-①	●	●●	/	●●●●	●●●●●●	●●●	quartz, plagioclase, microcline, chlorite, muscovite	Bone fragments concentrate in the sand clasts; carbonate-phosphate nodules are significantly dissolved; The phosphate nodules include radiating acicular montgomeryites at higher magnification
West baulk II	J103#3-②	●●●●	●●●●	/	●●●●●●	●●	●●●	quartz, plagioclase, microcline, chlorite	Bone fragments show evidence of burning and are finely comminuted;

									The phosphate nodules include radiating acicular montgomeryites at higher magnification.
	J103#2-①	●●●●●	●●●●	/	/	/	/	quartz, plagioclase, microcline, chlorite	Bone fragments show evidence of burning and are finely comminuted
	J103#2-②	●●	●●	/	●●	●●●	/	quartz, plagioclase, microcline, chlorite	Bone fragments show evidence of burning
	J103#2-③	●●●●●	●●●●	/	●●●●	/	/	quartz, plagioclase, microcline, chlorite	Bone fragments show evidence of burning and are finely comminuted
West baulk III	J103#2-④	●●	●●	●	●●●●●	/	●●●●●	quartz, plagioclase, microcline, chlorite	Bone fragments show evidence of burning; The phosphate nodules include radiating acicular montgomeryites at higher magnification.
	J103#1-①	●●●	●●	●	●●●	●●●	/	quartz, plagioclase, microcline, chlorite, chalcedony	A fragmented fishbone attached to the silt nodule

West baulk IV	J103#1-②	●●●●	●●	/	●●●●●●	/	●●●●●	quartz, plagioclase, microcline, muscovite	/
	J103#1-③	●●	/	/	●●●●●	●●●●	●●●	quartz, plagioclase, microcline, chalcedony	The phosphate nodules include radiating acicular montgomeryites at higher magnification.

<2%: ●; 2%: ●●; 5%: ●●●; 10%: ●●●●; 20%: ●●●●●; >20%: ●●●●●●

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