SURPLUS STORAGE AT EARLY MOUNDVILLE:

THE DISTRIBUTION OF OVERSIZED JARS

AT MOUND W AND OTHER

OFF-MOUND LOCATIONS

by

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ABSTRACT

Theories of the development of complex, middle-range societies often equate the production and control of surpluses with centralized political economies. Indeed, most descriptions of Mississippian chiefdoms assume the control of surpluses shifted from domestic producers to elite, chiefly actors at the beginning of the Mississippi period. This thesis examines surplus storage locations, facilitated by uniquely oversized jars, within the Moundville region. It is found that surpluses remained within domestic, residential groups at Moundville throughout the site's period as a populated, civic-ceremonial center. The role of an economically autonomous population during the coalescence of the Moundville site is discussed.

CHAPTER 1
INTRODUCTION

This thesis discusses the issue of surplus storage at early Moundville by examining the distribution of large, ceramic storage vessels. The production and control over surpluses have figured prominently in discussions of the origins of social complexity and the development of chiefdom-level societies. As a result, the control of surplus production and distribution has been a major interest to archaeologists concerned with the political-economic organization of Mississippian societies.

A surplus can been defined as the amount of production beyond the subsistence needs of individual producers or households; however, such a generalized definition is ripe for debate (cf. Harris 1959; Pearson 1957; Sahlins 1972). Although surpluses are discussed throughout this thesis, I am aware of the problems inherent in defining a surplus or linking the advent of surpluses to societal developments *a priori* (see Cobb 1993). The surplus concept in this study is employed more as an empirical approach to better understand the relationship between economic production and the nature of social relationships embedded within the process of allocating surplus labor (Wolf 1982).

Following this brief chapter, four other chapters are included in this thesis. Chapter 2 presents an overview of several models used to explain the development of chiefdom-level societies, with particular focus on the central role of surpluses in each

model. The political-economic model for Moundville is also discussed. Chapter 3 discusses the materials and methods used during two separate analyses of the Mound W ceramic assemblage. Chapter 4 presents the results of both analyses, and compares data from Mound W to ceramic data from mound and off-mound locations in the Moundville region. Finally, Chapter 5 discusses the significance of the results of these comparisons in light of the organization of surplus production at early Moundville.

CHAPTER 2
SURPLUSES AND THE DEVELOPMENT OF CHIEFDOM-LEVEL SOCIETY

In this chapter I review the concept of surplus in archaeology, especially within models offered to explain chiefdom development. A short survey of the chiefdom literature is given in order to highlight the relationship between surpluses and chiefdom organization. It is shown that the control and use of surpluses are factors that remain central to most, if not all, theoretical statements on chiefdoms.

In the American Southeast, late-prehistoric chiefdom-level societies have been the focus of much archaeological attention. These societies are generally described as hierarchically organized polities that have centralized political economies structured to mobilize surpluses and labor (Scarry 1996). The Moundville site is argued to be the location of one prototypical Mississippian chiefdom (see Rees 2001:133-140). Like other chiefdom-level societies, a main component of Moundville's economy may have been elite control over the storage of agricultural surpluses, and subsequently, the organization of labor directed to increase agricultural output (Peebles and Kus 1977; Welch 1991). Direct archaeological correlates of surplus food storage locations in Mississippian chiefdoms remain elusive, however, and no direct evidence of centralized storage facilities has been recovered in the Moundville region (Welch and Scarry 1995:414). This research seeks to identify surplus food storage locations, facilitated by the use of uniquely oversized storage vessels, in the Moundville region in order to evaluate the

proposed relationship between the control of centralized food surpluses and the coalescence of the Moundville site.

A Brief History of Surplus and the Chiefdom-Level Society

In order to frame the central issue of this thesis – the proposed relationship between the control of economic surpluses and the rise of hereditary elites and social complexity – it is necessary to track both surplus production and the chiefdom within anthropological literature. Chiefdom-level societies have been the focus of much anthropological and archaeological discussion. Despite the problems that arise when societies labeled chiefdoms are considered prototypical evolutionary types (Feinman and Neitzel 1984), most have retained the use of the term for heuristic purposes. Since the 1990s, researchers have recognized greater diversity in the ways chiefdoms were organized (Earle 1991). Archaeologists working in the southeastern United States have played a role in forwarding this discussion (Cobb 2003), and Mississippian archaeologists have been credited for their contributions to the wider anthropological study of middle-range or ranked societies (Carneiro 1998:182).

Despite the more eclectic approach, the rise of hereditary elites and the development of complex political-economic structures have remained central facets of chiefdom research. Historically, scholars have held that the centralized control of food surpluses was a dominant factor in the establishment of social ranking and stratification, political authority, and control over labor (Halstead 1989:68-70; Stanish 2004:10-11) – what has been called the "surplus theory" by anthropologists and economists (Harris 1955; Pearson 1957). Mississippian researchers have used a similar notion of centralized

surpluses to underlay most models of chiefdom development (Anderson 1994, 1996; Emerson 1997; King 2003; Pauketat 1994; Peebles and Kus 1977; Steponaitis 1978; Welch 1991). Recently, however, some have questioned the claim that elites in the Mississippian Southeast ever took control over economic resources (Muller 1997), and others have called for closer examination of the processes and organization of production, labor, and the subsequent flow of surpluses that embodied prehistoric political economies (Blitz 1993a; Cobb 1996, 2000; Pauketat 2004; Saitta 1994).

In an early discussion of surplus by an archaeologist, Childe (1954:30) suggested that "society persuaded" producers to create "a surplus of foodstuffs over and above their domestic requirements." These new surpluses were necessary for the emergence of complex socioeconomic institutions beyond the immediate concerns of mere domestic subsistence production. Soon thereafter, many scholars insisted that elites were the primary movers of society. Any active participation of domestic producers in provisioning society, or the *public economy*, was seen solely as responses to encouragements by elites (Sahlins 1972). Despite lucid critiques of assigning *a priori* meanings to surpluses (e.g., Pearson 1957), the idea that surplus production would always be beyond the minds and will of domestic producers became the norm (Halstead 1989:68-70). This perspective encouraged mid- to late-twentieth century anthropologists interested in the evolution of complex society (i.e., chiefdoms and states) to focus on institutionalized hierarchies that would effectively separate elites from commoners (Meskell 2001:191).

Julian Steward can be credited with the first detailed description of a chiefdom-level society in his edited volume, *Handbook of South American Indians*, in 1948.

Although the term "chiefdom" was not used, Steward's Circum-Caribbean culture was described as societies headed by a chief whose status relied heavily upon wealth produced by both the chief's household as well as commoner surpluses. Later, Kalervo Oberg (1955) applied the term "chiefdom" to describe Circum-Caribbean and other similar societies. Oberg was concerned with creating a typology for societies that would adequately classify a range of sociopolitical units containing different social structures. He described six sociopolitical types ranging from the "homogenous tribe" to the "theocratic empire," with the "politically organized chiefdom" ranking third in his list. Oberg believed that each level in his typology represented a society of greater structural complexity corresponding to reorganizations functionally associated with economic, military, judicial, artistic, and ideological domains.

Food surpluses were critical to Oberg's (1955) chiefdom concept. Preconditioning any movement from a less complex to a more complex social type were increases in population density and food surpluses. Oberg noted, however, that these changes only spurred increases in social complexity if they related directly to the advancement of food production. Further, he cited the fact that chiefdoms consisted of multiple villages each ruled by a local chief that fell under the political control of a paramount chief. In addition to fulfilling judicial, military, and religious roles, chiefs were "responsible for the storage of extra provisions and for their ultimate distribution among the villagers" (Rouse 1948:528-529, cited in Oberg 1955:485). Although Oberg did not single out chiefs' redistributive roles as the sole causal factor in the development of chiefdoms, he did list it as one of the primary influences that pushed producers to create food surpluses beyond their basic subsistence needs.

Shortly after Oberg's (1955) article appeared, Marshall Sahlins's (1958) work on Polynesian chiefdoms was published. Although he did not use the term chiefdom, Sahlins classified Polynesian societies according to the presence of social ranking and stratification, and highlighted the social status, prestige, and political attributes of chiefs. For Sahlins, the redistribution of goods was the main source of a chief's elite social status and prestige, and therefore the basis of chiefdom development was purely economic.

These early discussions of chiefdom-level societies highlighted the function of chiefs as collectors and distributors of food surpluses. The term "chiefdom" was not always applied to these societies until Elman Service published *Primitive Social Organization* in 1962. Service, indebted to the concept of social evolution, sought to classify societies according to their position along a scale of increasing social complexity. His terms – bands, tribes, chiefdoms, and states – are still commonly used today as heuristic devices. Service (1962:144, emphasis in original) defined chiefdoms as "*redistributional societies* with a permanent central agency of coordination." The chiefly office, in this capacity, evolved as a managerial position to accommodate the equal distribution of goods produced from numerous localities, each positioned in highly specialized environmental niches. The authority and elite status of the chief resulted from his role as coordinator of centralized food stores. In essence, the chief and his office became an institutionalized leveling mechanism (*sensu* Polanyi 1957). Morton Fried (1967:117-118) also stressed the redistributive role of chiefs within a ranked society, and attributed their prestige and political status to the amount of goods they could distribute.

Despite the popularity of Service's (1962, 1975) evolutionary model, archaeologists began forming critiques of his definition of redistribution (i.e., Carneiro 1981; Earle 1977; Muller 1986, 1987a, 1987b; Peebles and Kus 1977). Timothy Earle (1977), in discussing Hawaiian societies, produced an oft-cited and influential reevaluation of chiefdoms and their central organizing principles. Earle believed that Service misinterpreted the qualitative nature of the flow of goods in chiefdoms, but similarly retained a form of redistribution that was imperative to the development of elite positions. Under Service's model, commoner households should not be economically self-sufficient, but reliant upon chiefly supplements. The chief's redistributive role functioned to integrate and maintain societies composed of economically dependent household productive units. In Hawaii, however, commoner households seemed to be economically self-sustaining. This did not mean that redistribution did not take place. For Earle, "the redistributive hierarchy functioned primarily in the special context of financing the elite stratum and its political activities" (1977:217). Self-sustaining, commoner groups benefited from the irrigation facilities constructed (using commoner labor), coordinated, and owned by the chiefly elite (Earle 1997). The privilege of residency near the chief's irrigated fields did not come free of charge. Commoners were required to make payments to the elite as a form of taxation or tribute. The elite could then use the appropriated surplus to construct more irrigation canals (using commoner labor), fund military forays, and craft symbolic chiefly regalia (Earle 1997:200-203). Whereas Service had viewed the centrally controlled flow of goods in adaptationalist terms, Earle had reason to believe that chiefs collected food to fund their own political projects. Following Earle's critique of redistribution, the concept of the aggrandizing

chief became a central argument within much of the chiefdom literature. Redistribution serving as a leveling mechanism could increase prestige, but chiefs could only accrue power when they began appropriating surpluses for their own gains (Carneiro 1981:58). The exploitative nature of elite-commoner relations, then, was seen as a measure of a chief's political power.

By the 1970s, the interpretation of chiefdom-level societies was substantially transformed. Initially, chiefdoms were seen to have evolved due to increased food surplus production. Paralleling this development was the formation of the chiefly office, which fulfilled a necessary redistributive role that served to maintain and encourage the reproduction of society. Social status and prestige were considered byproducts of this new institution of chiefly economic manager. Not long thereafter, critiques of the redistribution model formed, with Earle's (1977) discussion of Hawaiian chiefdoms as the main catalyst. Chiefs were no longer viewed as generous coordinators of centrally organized stores, but as aggrandizing individuals who sought to maximize from their position as the controllers of goods and labor. Mapping political authority and power became the trend within chiefdom studies in many parts of the world, including much of the chiefdom literature of the American Southeast (Yoffee 1993; Cobb 2003). Although the focus within chiefdom studies had shifted from managerial redistribution to appropriating elites, one central facet remained constant: chiefs were in charge of centrally stored food surpluses.

The flow of surpluses remained a key issue in chiefdom studies, but now several scholars grew concerned with how tributary relations supplied chiefs with surplus goods (Barker and Pauketat 1992; Peebles and Kus 1977; Steponaitis 1978). Problems applying

Service's evolutionary model to all known chiefdoms forced archaeologists to refine the chiefdom type. Drawing upon Earle's (1977) depiction of Hawaiian chiefdoms, Peebles and Kus (1977) discuss archaeological correlates of prehistoric chiefdom societies in general, and the Moundville chiefdom specifically. Using a cybernetics model, they make the claim that higher-order levels of information processing necessary for the creation of complex cultural systems should be structured hierarchically. In regards to ranked societies, the organization of production must be structured so that information can be processed (i.e., agricultural surpluses produced, stored, transported, used meaningfully) to produce the archaeological correlates of chiefdoms (e.g., monumental mounds) (Peebles and Kus 1977:432). The information processing in chiefdoms, according to Peebles and Kus, occurs at a political level – that of the chief – that must transcend the domestic sphere. Following Sahlins (1972), Peebles and Kus (1977:423, 427) believe households cannot by themselves provision a public economy. Agricultural producers, or commoners, are at once separated from the political sphere and share no role with elites in decision-making: "the flow of information is from all to the chief and from the chief to all" (Peebles and Kus 1977: 430). Again, looking to Earle's (1977) Hawaiian chiefdoms, Peebles and Kus (1977:423) state that this "notion of the public economy, where production is in part controlled at a level above the basic household unit of production and consumption, fits well with the ethnographic data on chiefdoms."

Surplus and Mississippian Political-Economic Models

As a result of the interpretation by Peebles and Kus (1977), the separation of economic producers from politics became the guiding principle in chiefdom research.

Archaeologists working in the Mississippian Southeast turned to political models that explained, but often took for granted, economic change (Muller 1997:39).

One political model still much in use today to describe Mississippian chiefdoms is the simple-complex chiefdom model (Steponaitis 1978). In order to chart the political complexity of chiefdom societies, Steponaitis (1978) argues that the number of decision-making levels above the domestic household unit can be used as a proxy for determining a society's level of political integration. A simple chiefdom consists of only one decision-making level above the household, represented by a two-tiered settlement hierarchy. A complex chiefdom contains two decision-making levels above the household, marked by a three-tiered settlement hierarchy. Since Mississippian archaeologists were well trained in constructing settlement patterns, the simple-complex model could easily be applied.

In both simple and complex chiefdoms, surpluses are centrally collected at the political center under the auspices of the chief (Steponaitis 1978). In simple chiefdoms, centrally organized stores are redistributed to commoners, much in the way that Service (1962) had envisioned. Chiefs and their elite families remain part-time producers and are restricted from appropriating profits from communal stores. In complex chiefdoms, however, chiefs and their families are relieved from their duties as direct producers, and surpluses flow from commoners as forms of tribute used to subsidize the political endeavors of elite chiefs. The three-tiered settlement hierarchy of this system allows chiefs at secondary mound centers to store goods directly expropriated from domestic production units, where some of it can then be shipped on to higher-ranking chiefs (Steponaitis 1978:420). As in earlier explanations of chiefdom societies, the simple-

complex chiefdom model retained the assumption that elites persuaded, or pushed, farmers to produce a surplus, and the settlement pattern of a specific chiefdom resulted from the qualitative nature of its centralized political economy.

Using the simple-complex model (Steponaitis 1978), one can expect to find evidence of surplus food storage in elite contexts in both simple and complex chiefdoms. It can further be assumed that in a complex chiefdom one should be able to locate even greater disparities in surplus storage between elite contexts and domestic house locations since little, if any, of the food gets redistributed back to commoners. It should be noted here, however, that despite the widespread adoption of the simple-complex chiefdom model in Mississippian research, more recent developments have forced some scholars to question the applicability of the model (Blitz 1999; Blitz and Lorenz 2006).

Surplus and the Moundville Political-Economic Model

The building of the Moundville site would have required the use of surplus labor, and studies have shown that an increase in agricultural production needed to finance such efforts reached high levels throughout the Moundville I phase (Scarry 1986). However, the realization that surpluses were available does not provide explanations for how those surpluses were used, and Moundville researchers have sought to provide explanations for the "push" felt by domestic producers to create surpluses (Steponaitis 1991:204).

Moundville, located along the Black Warrior River in Alabama, was a multiple-mound site inhabited during the Mississippi period (Figure 1). It has been extensively argued that Moundville was the political capital of a complex chiefdom (Knight and

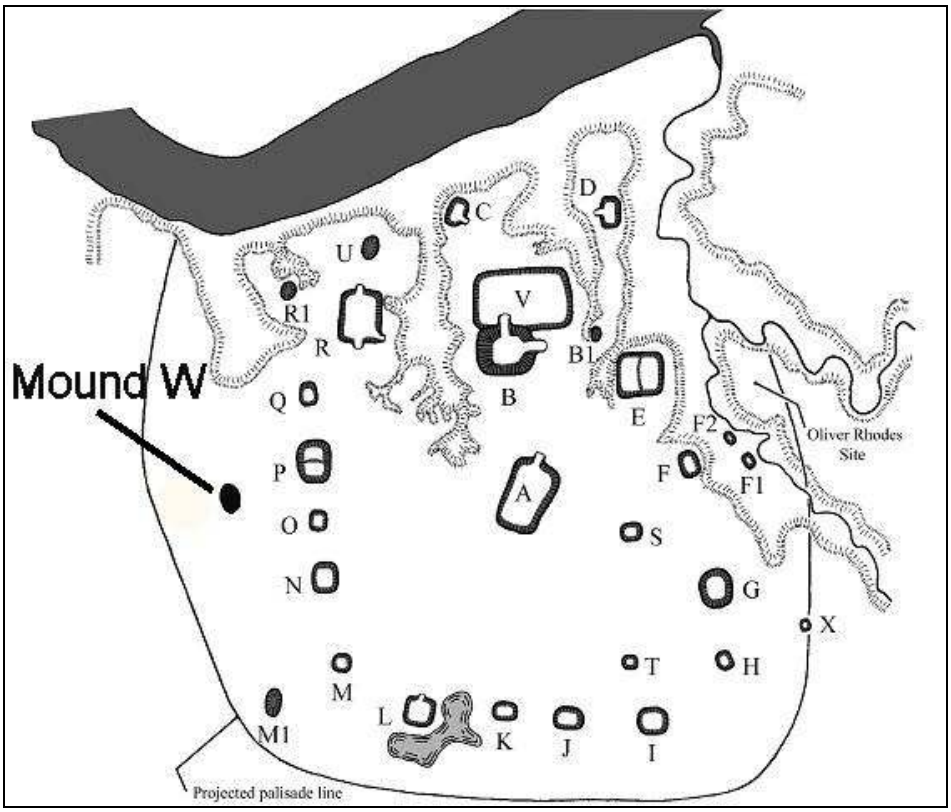

Figure 1. Map of the Moundville site showing location of Mound W (adapted from Knight and Steponaitis 1998:Figure 1.1).

Steponaitis 1998; Peebles and Kus 1977; Steponaitis 1978; Welch 1991). This interpretation is based on the presence of a series of single-mound sites and dispersed farmsteads north and south of the Moundville site that have traditionally been interpreted as representative of a three-tiered settlement hierarchy (Figure 2). Although it is difficult to assess the chronological relationships among the mound sites within the Moundville region at this time (Welch 1998), a political-economic model for the Moundville region has been constructed upon this assumption.

Welch (1991, 1996) has produced the prevailing political-economic model for the Moundville region. In keeping with the notion of a three-tiered settlement pattern that functioned to facilitate tribute flows from commoners to elites, Welch evaluated several theories of chiefdom economy and produced a model particular to Moundville (Figure 3).

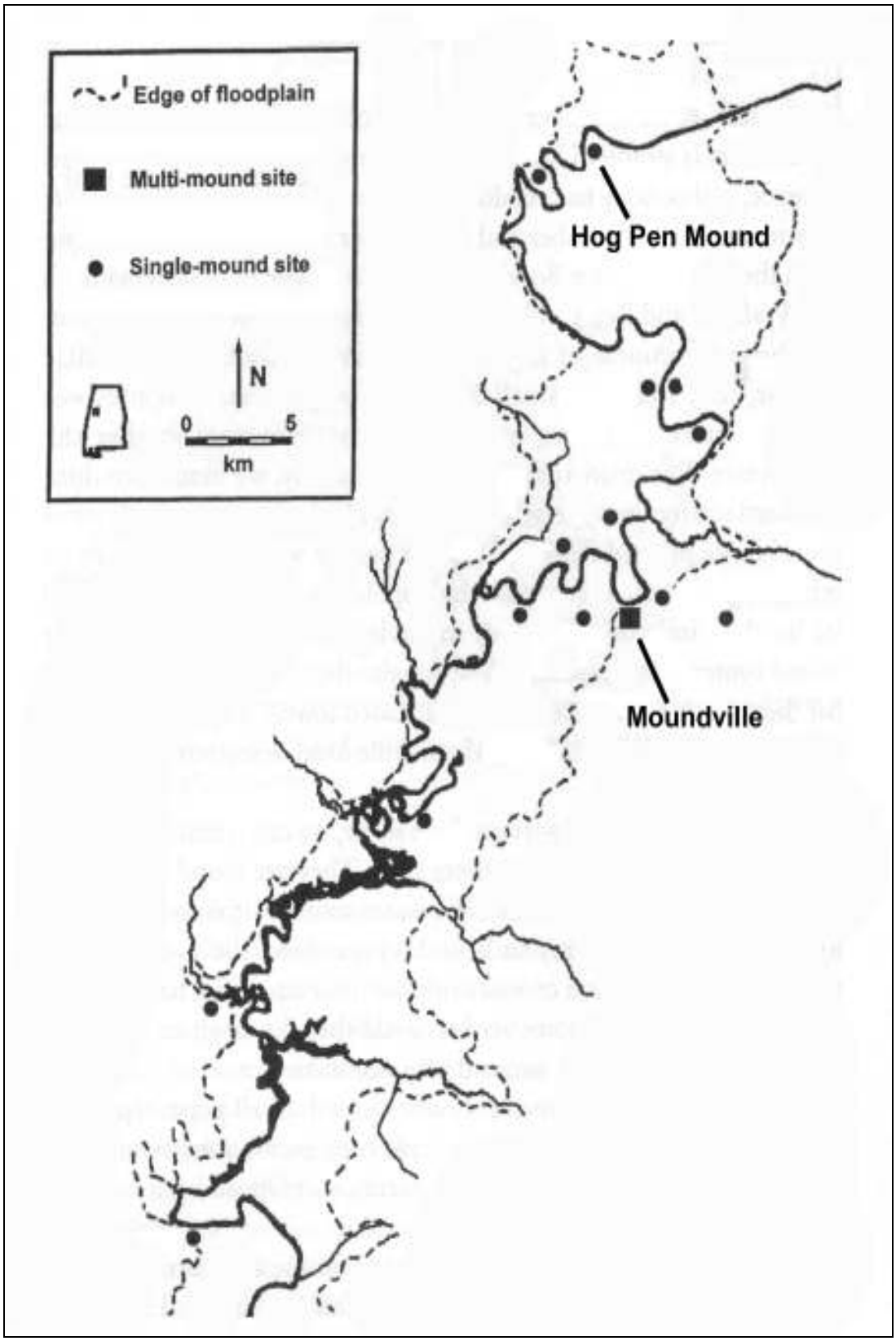

Figure 2. Archaeological sites in the vicinity of Moundville (adapted from Welch 1998:Figure 7.1).

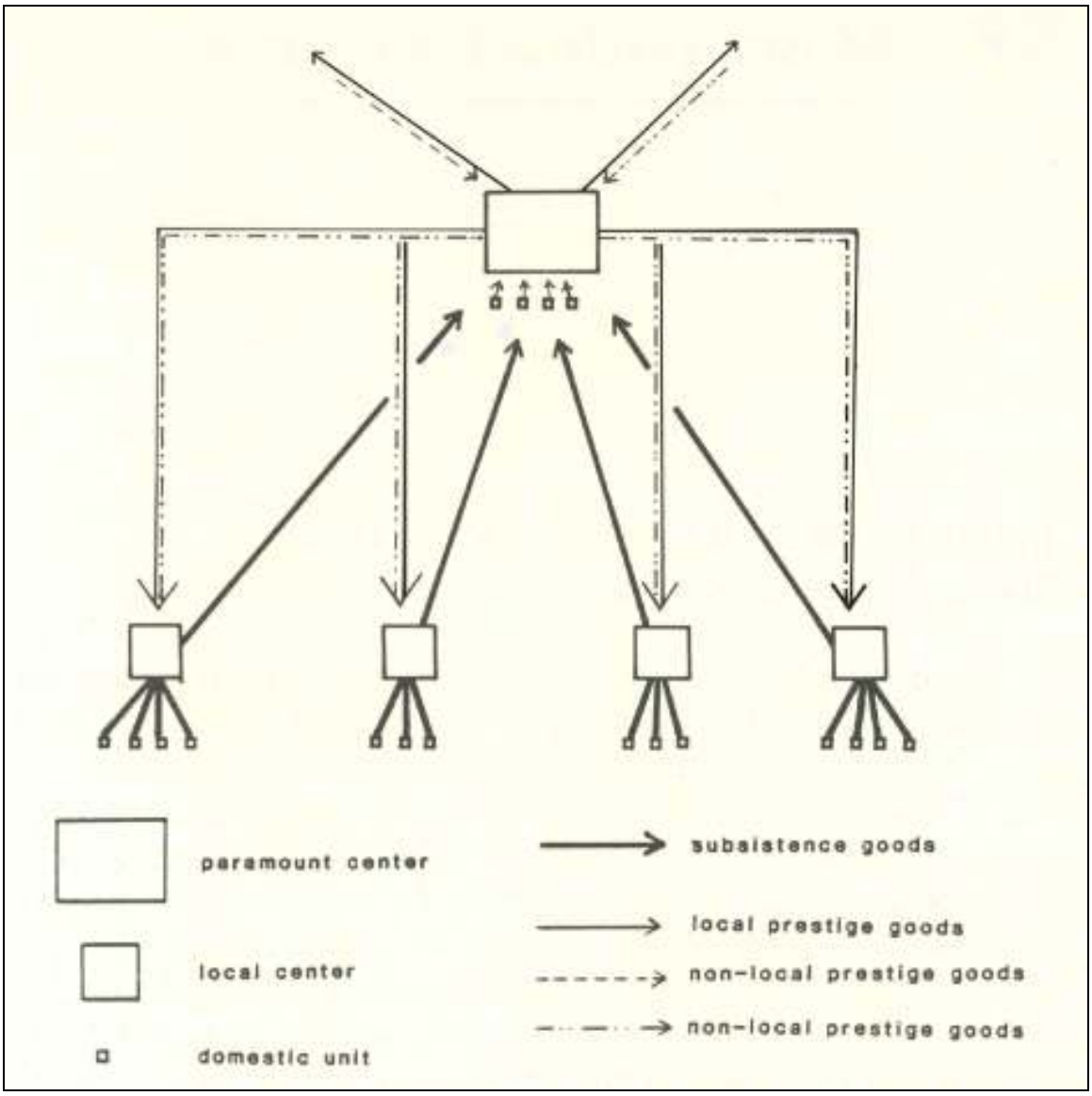

Figure 3. The Moundville Economy Model as proposed by Welch (1991:Figure 6.1).

In the Moundville economy model, he differentiated between two general classes of goods: crafted goods (including tools and prestige/display items), and raw materials (including food). Welch believed subordinate chiefs stationed at secondary mound centers stored food extracted from producers at domestic farmsteads. Then, a portion of these surpluses could be sent on to the paramount chief at Moundville. Similarly, domestic producers who lived at the Moundville site itself funneled food directly to the

paramount's central stores. Chiefs at secondary mounds received payments for the subsistence items they sent to Moundville in the form of elite-controlled, local and non-local prestige goods. No prestige goods reached the domestic, subsistence-producing units. It should be noted that domestic, food-producing units located at the Moundville site are shown by Welch in Figure 3 as the small boxes next to the paramount center. Notice that solid black lines leaving these small boxes indicate that they supplied the paramount chief with food, but for nothing in return.

The Moundville political-economic model is used to argue that elite control of craft production functioned to produce and maintain political authority (Steponaitis 1991; Welch 1991, 1996). If the political economy functioned in this way, then certain archaeological correlates should be expected. These include: 1) the lack of non-utilitarian crafts and production debris in non-elite contexts, 2) a limited subset of non-local crafts and no production debris at secondary mound centers, and 3) concentrated locations of craft production at Moundville, with finished crafts only in elite contexts (Blitz 2005). If the political economy functioned as is currently proposed (Welch 1991), I would also add as a fourth archaeological correlate that, 4) evidence for surplus food storage should be greater in elite mound contexts than in non-elite contexts. Several recent archaeological studies at Moundville and the surrounding region that examined the distribution of crafted items and evidence for elite control over agricultural production have in fact produced evidence contradictory to the current model (Phillips 2006; Marcoux 2000; Maxham 2000; Wilson 2001, 2005; Wilson et al. 2006). Studies examining patterns of surplus food storage locations within the Moundville region are also needed to assess the reliability of the Moundville political-economic model.

It is important to note that evidence of surplus food storage in unsuspected locations would be insightful for reexaminations of Moundville's political-economic model; however, contradictory evidence resulting from the examination of all four archaeological correlates discussed above would be needed (i.e., see Steponaitis 1991; see also discussion in Earle 1991). Conversely, the location of a preponderance of food storage within elite contexts could be used to support the hypothesis that Moundville's economy functioned in the manner proposed by Welch (1991). Therefore, a critical step towards evaluating the role of surpluses in chiefdom-level societies in general, and at Moundville specifically, is to construct archaeological measures of surplus foods.

Archaeological Measures of Surplus Food in the Mississippian Southeast

Surpluses can be identified from the archaeological record in two main ways: the location and documentation of storage facilities, and through material patterns reflecting the use of surplus labor (e.g., feasting, monumental architecture, tribute/provisioning, etc.). It should be kept in mind, however, that any abstraction of an economy risks trivializing the very social interactions that constitute a surplus (Pearson 1957; Saitta 1994, 1997). As Saitta (1994:201) states, a sole focus on the flow of surpluses without consideration of the organizing principles that structure the surplus labor process "can obscure important organizational details and variation in political-economic relationships." In addition, the mere consumption of surpluses during prehistoric events that produced the material patterns/archaeological correlates of complex society, like monumental mound architecture, however, cannot be taken as post hoc evidence for elite-controlled, centralized organization of surplus production (Brown 2006). The generation

and flow of surpluses alone are meaningless when the culturally defined means for their use are not considered within each historically defined case (Pearson 1957; Spielmann 2002; Wilk 1991). Culturally relevant avenues must be present for the social use and display of surpluses.

Storage Facilities

In a recent examination of surplus food storage in the Mississippian Southeast, one scholar noted the active role food storage had upon social ranking and political power (Wesson 1999). Accordingly, it was "argued that the ability of elites to control surplus foods and communal storage facilities played a major role in the emergence of chiefdoms in southeastern North America" (Wesson 1999:145). This notion is widespread throughout Mississippian literature for several reasons, not the least of which is the historical importance placed upon chiefly control of food stores since the earliest discussions of chiefdom-level societies and surpluses. Also, it has long been realized that the beginning of the Mississippi period marked a substantial increase in agricultural production (Griffin 1952; Smith 1989). This holds true for the Moundville region (Scarry 1986).

At the same time, however, southeastern archaeologists have also documented a trend in the near complete absence of large subterranean storage pits at early Mississippian sites, at least in some regions (DeBoer 1988; Wesson 1999). In the Moundville region, large subterranean pits used for individual household storage during the West Jefferson, or Late Woodland period, are seemingly absent in the Mississippian Moundville phases (Blitz 1993a:100; Mistovich 1988; Scarry 1998:93; Welch 1998:155).

In the absence of large pit features, archaeologists have turned elsewhere for evidence of storage. Relying upon ethnohistoric accounts by early European travelers of food granaries in above ground cribs (Bartram 1958; Swanton 1946), it has become commonplace to assume food was stored in the same manner during the Mississippi period. However, there is no direct evidence documenting such storage practices at Mississippian sites in Alabama (Scarry 1998; Welch and Scarry 1995:414; Wesson 1999; but see Blitz 1993a:100 for a possible example at Lubbub Creek), albeit possibly due to their ambiguous archaeological signatures. If early Mississippian food surpluses did not remain under the control of households as they had in earlier times, then it is easy to assume surplus storage came under the centralized control of elite chiefs. The complete absence of household-based storage may suggest a Mississippian political culture developed that had as one of its core components the effectual separation of the domestic subsistence economy from a surplus-producing political economy (Earle 2002:9). Towards the end of the Mississippi period, subterranean pits once again become visible in the archaeological record (DeBoer 1988). This has been interpreted as the reestablishment of household control of food surpluses – due to both the decline of political authority at the major mound centers, and as a form of resistance that was coevally responsible for eroding elite, chiefly political authority (Wesson 1999).

The centrality of surpluses in explanations of Mississippian political developments can be considered analogous to earlier uses of the "surplus theory" to explain socio-cultural development. The organization of surplus production and the control of food surpluses are important lines of enquiry when considering the nature of

political economies. Evidence for surplus storage at Moundville has not been adequately documented.

Feasting and Mound Construction

Feasting has received a resurgence of attention in recent years (Dietler and Hayden 2001a). Feasts are considered to have served prominent ritual and political roles prehistorically (Hayden 1996, 2001). Through feasts, surpluses are "transformed directly into status" which in turn allows for the generation of greater surpluses (Friedman and Rowlands 1978:208; Friedman 1975). Those who are able to fund feasts, therefore, are considered the beneficiaries of political gains (Dietler and Hayden 2001b; Stanish 2004:11-12). In the Mississippian Southeast and at Moundville, feasting has been linked to the construction of mounds and the structuring of new socio-political relationships in politically charged, social events (Kelly 2001; Knight 1986, 1989, 2001; Pauketat 2003; Pauketat et al. 2002). Likewise, it has traditionally been assumed that elite chiefs supplied food surpluses for feasting events and were subsequently the beneficiaries of status, political authority, and power (see Brown 2006:198, 209).

In a study of the Lubbub Creek chiefdom, Blitz (1993a, 1993b) looked for evidence of feasting events and food storage. By comparing ceramic assemblages from mound and village contexts, he was able to show there were no differences in vessel types and shapes between the two contexts. He did find, however, that mound assemblages contained larger vessels than did village assemblages. Blitz concluded that the ceramic assemblages could not be used to argue for wealth differences among individuals occupying either space, but larger vessels could indicate the occurrence of

social feasting events at the mound locations. These findings made him question the distinct political-economic dichotomy often drawn between elite political actor and agricultural producer (Blitz 1993b:93).

In a similar study in the Moundville region, Welch and Scarry (1995) examined Moundville I phase ceramic remains from two farmsteads, one secondary mound site (Hog Pen Mound), and Moundville itself. Like Blitz, they were interested in trying to distinguish status-related variation among different locations relating to the use of foods. Welch and Scarry were able to document more variation in ceramic types among the four locations than did Blitz at Lubbub Creek. Unlike Blitz's study, however, Welch and Scarry did not measure vessel sizes. They do note that size data do exist for two non-contemporaneous assemblages in the Moundville region, and although the chronological difference between the two samples precludes a proper comparison, no size differences appear between the assemblages (Welch and Scarry 1995:415-416). Welch and Scarry also note a difference between vessel sizes between the Moundville and Lubbub Creek samples. The largest vessels present at Lubbub Creek have rim diameters of 45 cm, whereas at Moundville, there exists a distinct mode of unburnished vessels with rim diameters greater than 50 cm. It is likely that these "oversize jars" served primarily as food storage vessels (C. Scarry 1995:49; Welch and Scarry 1995:410; Wilson 2005:157-159).

Although the study conducted by Welch and Scarry (1995) was not able to engage the issue of food storage directly, they do bring up a crucial point. Following Blitz's (1993a, 1993b) study of social feasting at Lubbub Creek, Welch and Scarry (1995) comment on the elevated importance of large-scale feasts at Moundville. They admit,

however, that the traditional assumption that chiefs funded feasts remains problematic: "since we have not yet identified structures for storing food at Moundville or elsewhere in the polity, we have no way to determine whether the nobles controlled sufficient foodstuffs to fill their private needs and to supply large-scale presentations" (Welch and Scarry 1995:415). It is therefore equally as important to consider the possible role that non-elites might have had in funding such important political and ritual events. If non-elites were able to fund large-scale, mound-top feasts, then we must entertain the idea that those traditionally viewed as commoners had the social channels available to also accrue political and social prestige – we must not eschew the idea that domestic producers could participate in the *political* process that provisions the public economy (*sensu* Peebles and Kus 1977; Sahlins 1972). This possibility has largely been missing from past theoretical discussions of Mississippian chiefdoms.

Identifying Surplus Food Storage within the Moundville Region

In light of the role food surpluses play in accounts of chiefdom development, it seems necessary to examine where food surpluses were stored in the Moundville region. Currently, Moundville's elite are assumed to have controlled surpluses, thus enabling them to oversee a political economy fueled by surplus labor. However, as noted by Welch and Scarry (1995), there exists a major gap in the archaeological record concerning the control over food surpluses at Moundville. Therefore, more detailed examinations of surplus food storage locations are necessary.

This research seeks to identify surplus storage locations within the region in order to evaluate the proposed relationship between centralized food stores and the coalescence

of Moundville. Ceramic evidence of surplus storage from two locations will be compared: Mound W – a proposed non-elite, domestic area at the Moundville site (Johnson 2005); and Hog Pen Mound – a proposed elite, secondary mound center (Holland 1995; Welch 1998). These locations represent two integral levels of Moundville's proposed political economy (Welch 1991) and differences related to surplus storage should be visible when the two ceramic assemblages are compared. When compared, three distinct results may be produced, and possible interpretations of each are discussed below.

First, if the vessel size data reveal a greater food storage capacity at Hog Pen Mound than at Mound W, then this finding could be used to support the hypothesis that Moundville's economy functioned in the manner traditionally proposed (Welch 1991). Alternatively, if no differences in storage capacity are documented between the two locations, then it cannot be assumed that elites were in charge of greater amounts of stored food than commoners, and it cannot be argued that the control of food surpluses by elites was correlated with the development of Moundville. There is also the possibility that Mound W contained a greater capacity of food storage than Hog Pen Mound. In this case, the hypothesis that domestic producers retained control of food surpluses at Moundville can be more strongly supported. This latter conclusion would demand that archaeologists reconsider some basic theoretical assumptions about the possible roles of agricultural producers in the creation and reproduction of what is called complex society.

CHAPTER 3
MATERIALS AND METHODS

The major focus of this thesis concerns the issue of food storage within the Moundville region (Figure 2). If the mobilization and storage of food surpluses was a key factor in structuring the political-economic relationships in the greater Moundville region, then obtaining archaeological evidence of food storage facilities is desirable. In the absence of evidence for surplus storage facilities during the Mississippi period in the Moundville region, it seems plausible to turn to ceramic evidence of surplus storage.

Mississippian archaeologists have demonstrated that the function of large jars would have been storage (Blitz 1993b; Hally 1986; Steponaitis 1983). Previous studies of Mississippian vessel assemblages have documented jars with maximum rim orifice diameters at, or below, 50 cm (Blitz 1993b; Hally 1986; Shapiro 1984). Within the Moundville region, however, researchers have recently noted the presence of a unique class of very large jars with diameters greater than 50 cm that has been interpreted as specialized storage vessels (Holland 1995; Johnson 2005; C. Scarry 1995; Welch and Scarry 1995; Wilson 2005).

Wilson (2005:157-159) has made the tentative case that these oversized jars were used to store bulk foodstuffs. During his examination of domestic ceramic debris from Moundville's Roadway Excavations, he found that oversized jars retain no evidence of sooting or oxidation that forms from exposure to cooking fires. The size and weight of

these jars, and the fact that none have handles, suggest that these vessels were meant to remain stationary once filled, and could not easily have been suspended above a fire. Also, oversized jars exhibit a thickened rim produced by either the folding down of the lip or the application of a clay slab. This thickening process would have strengthened the vessel and may have served as a special lip for the attachment of a cover to facilitate the long-term storage of food surpluses (Wilson 2005:159; John Blitz, personal communication 2005). Knowing this, it appears necessary to assess arguments about surplus food storage in the Moundville region via empirical comparisons of surplus storage facilitated by use of ceramic storage vessels.

This chapter describes the archaeological materials discussed in this research (Table 1) and describes the methods employed during analysis. Two separate ceramic analyses were conducted. During May and June of 2006, a modal analysis was conducted on jars from Mound W to collect jar size data for comparison with data from Hog Pen Mound (Holland 1995). During October and November of 2006, I conducted a vessel form analysis on Mound W's complete ceramic assemblage. James Gilbreath and Krista Garcia aided me during this second segment of research. This additional research will allow Mound W's vessel assemblage to be compared to others recovered from off-mound locations at Moundville (Wilson 2005).

In this chapter, Mound W is presented first. I describe previous research at Mound W and detail the methods I used during the first segment of analysis. Then I discuss Hog Pen Mound, giving an outline of previous research at the site. After discussing Hog Pen Mound, I detail how data from the two samples will be compared. Following this discussion, I move on to describe the methods used during my vessel form

Table 1. Context File for Samples Utilized in this Research.

Site	Context	Phase	Provenience	
			General	
Moundville	Mound W		Surface, Debris, Centerline, W, Broken, Unlabeled	
		Early Moundville I - Early Moundville II	**Northing**	**Easting**
			0-210	L1-L10
			0-210	R1-R25
			0-210	East Bank
			0-210	West Bank
			Blocks	
Moundville [1]	Residential Group 1	Early Moundville I - Early Moundville II	0+00 - 3+25, 71+30, 125	
Moundville [1]	Residential Group 5	Early Moundville I - Early Moundville II	30+00 - 31+50	
Moundville [1]	Residential Group 7	Early Moundville I - Early Moundville II	0+10 - 40+50	
Moundville [1]	Residential Group 8	Early Moundville I - Early Moundville II	43+50 - 46+00	
Moundville [1]	Residential Group 10	Early Moundville I - Early Moundville II	70+50 - 72+05	
Hog Pen Mound [2]	Mound	Late Moundville I - Early Moundville II	**Unit**	**FS Lot#**
			62N12E	4-5, 7, 10, 10hf, 12, 14, 18, 25
			62N15E	3, 6, 9, 13, 17, 19, 77, 86

[1] Wilson (2005), [2] Holland (1995)

analysis of Mound W's assemblage. Last, I briefly discuss Wilson's (2005) study of residential assemblages recovered during Moundville's Roadway Excavations that will be used for comparative purposes.

Previous Research at Mound W, Moundville

Mound W was located in the western portion of the Moundville site (Figure 1). It was situated directly west of mounds P and O, lying between the plaza-mound group and the palisade. Presently, it is no longer visible on the landscape. Despite its name, Mound W was not an intentionally constructed mound, but a large midden deposit that accumulated at a residential, domestic area during the early Moundville occupation (Johnson 2005). Before discussing the contextual information concerning Mound W, a brief history of the archaeological investigations at the locale is due.

When Clarence B. Moore (1905, 1907) first published details of his work at Moundville, he did not discuss Mound W, nor did he label it as a mound. During the years 1930 to 1941, the Alabama Museum of Natural History (AMNH) sponsored excavations at Moundville using labor provided by the Civilian Conservation Corps (Peebles 1979). In 1934, Mound W was given its letter designation, and investigations were conducted in the areas "north and northwest of W" (Peebles 1979:4). The well-known Roadway Excavations took place in 1939 and 1940 under the direction of Maurice Goldsmith (Wilson 2005:59-61). Later in 1940, Goldsmith and a crew excavated Mound W in its entirety (Figure 4).

In the 1970s archaeologists looking at Goldsmith's excavation notes commented that Mound W was not a deliberately constructed mound but possibly a small, occupied

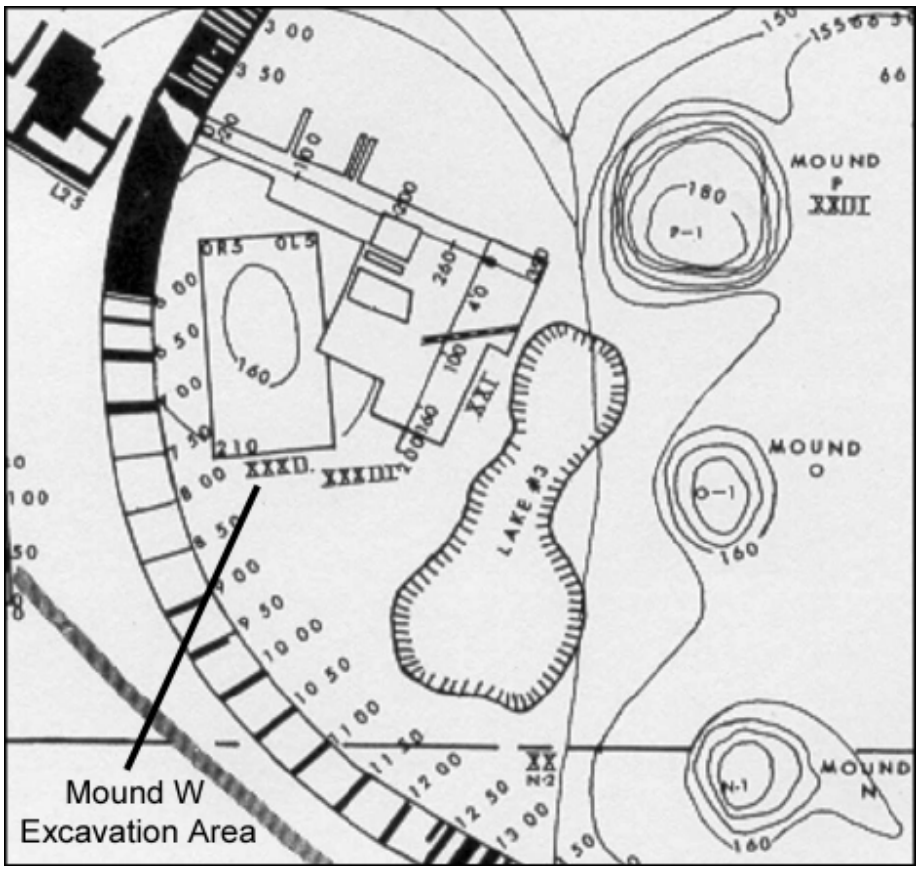

Figure 4. Map showing location of 1940 excavation of Mound W, Moundville (adapted from Peebles 1979).

natural hill (Peebles 1979:4, 29; Walthall and Wimberly 1978:121). It was also noted that Goldsmith's excavations at Mound W proceeded by removing vertical slices instead of horizontal layers (Peebles 1979:4). This meant that no planview maps were drawn and ceramic artifacts were collected from one general vertical provenience. Of more specific interest to archaeologists, however, was the small percentage of grog-tempered pottery present in the Mound W assemblage. It was believed that Mound W had the potential to yield information on the earliest occupations at the Moundville site (Walthall and Wimberly 1978:122).

About 25 years later, Pamela Johnson (2005) initiated a study of Mound W's ceramic assemblage and excavation records. She was interested in the occurrence of

grog-tempered pottery at Mound W, long considered to be diagnostic of a Late Woodland/West Jefferson component at Moundville. She wanted to establish a chronology of Mound W to better define the transition from Late Woodland/West Jefferson to Mississippian in the Black Warrior River Valley. Johnson determined that Mound W was "a domestic area occupied initially during Early Moundville I, utilized during Late Moundville I and Early Moundville II, and reused as a cemetery during Late Moundville II and Moundville III phases" (Johnson 2005:72). Similar to others (Scarry 1998; Welch 1994), Johnson concluded that grog (crushed potsherds) continued to be used as a tempering agent in small amounts during the earliest local phases of the Mississippi Period. Johnson's (2005) detailed examination of excavation records also allowed her to determine that Mound W was not a mound nor a natural rise, but the result of continued deposition of midden and occupied surfaces.

Johnson's (2005) chronology of Mound W bespeaks of an occupational history that occurred during the Moundville I phase and Early Moundville II subphase, beginning around A.D. 1120 and possibly stretching until A.D. 1300 (Knight et al. 1999). This time period corresponds to the developmental stages of "Initial Centralization" and "Regional Consolidation" at Moundville as defined by Knight and Steponaitis (1998:12-17) (Figure 5). Seemingly by the Late Moundville II subphase, Mound W ceased to serve as a domestic and residential area. During the late Moundville II and Moundville III phases, the location became the locus of a cemetery. Wilson (2005) has documented a similar pattern of use for other off-mound residential areas at Moundville (see also Knight and Steponaitis 1998; Steponaitis 1998).

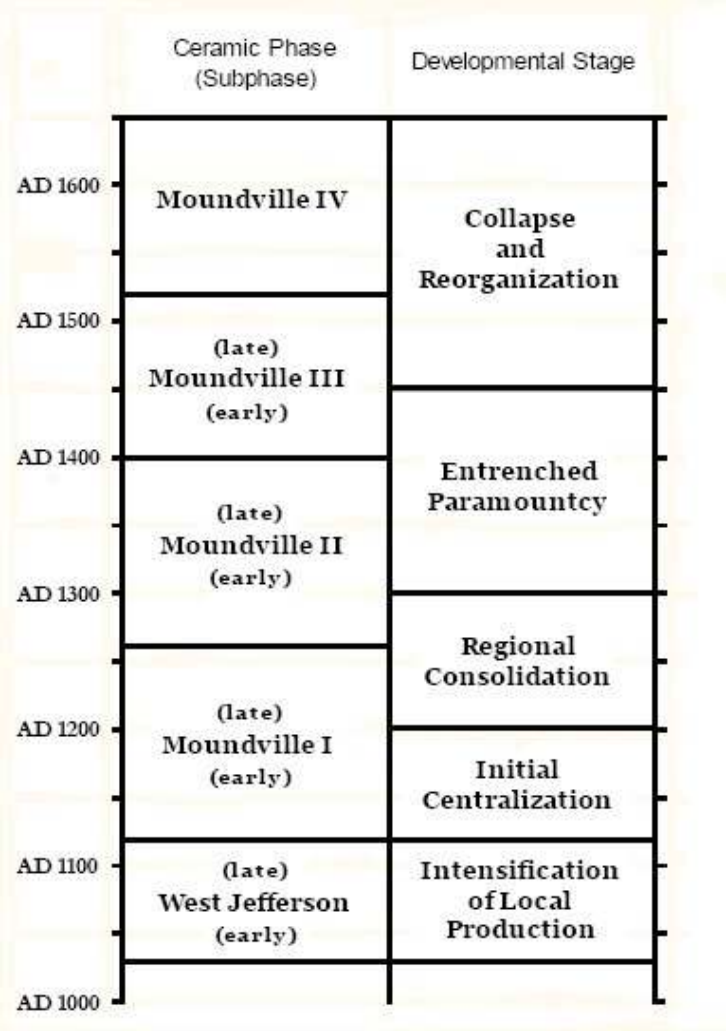

Figure 5. Moundville chronology and proposed developmental stages (from Johnson 2005:Figure 24).

My research concerns the storage of foodstuffs at Mound W. During her study, Johnson (2005:75) noted the presence of an "exceptional number of… extremely large jars." These vessels, referred to as oversized jars and described briefly above, have been recovered from several other locations throughout the Moundville region and many have commented on their probable role as storage containers of bulk foodstuffs (Holland 1995; C. Scarry 1995; Welch and Scarry 1995; Wilson 2005). In order to compare the extent of

storage capacities at Mound W to other locations throughout the region, I embarked upon a research project to collect vessel size data from jars in the Mound W assemblage.

Methods for Measuring the Size of Mound W Jars

The first step in my research was to collect vessel size data from jars at Mound W. Only jars were chosen because several studies of Mississippian pottery have demonstrated that large jars were used for storage (Blitz 1993b; Hally 1986; Steponaitis 1983). Because Mound W jars were recovered as potsherds, the first step was to separate all diagnostic jar rim sherds from the total assemblage for further study. Only rim sherds were retained because they provide the best diagnostic and morphologic markers, and contain measurable attributes that provide information about a vessel's size (Rice 1987). Diagnostic shape characteristics of Moundville jars, as defined by Steponaitis (1983), were used as sorting criteria. Any sherds that could be refitted or appeared to have originated from the same vessel were counted and analyzed as one single sherd. Also, jar rims too badly eroded or fractured to allow proper orifice diameter measurement were not included within this segment of the analysis.

After selecting all jar rim sherds from the total assemblage following the guidelines explained above, the specimens were classified according to type-variety as outlined by Steponaitis (1983)[1]. A series of attributes were then measured on each jar rim. Metric data for sherd height, width, and thickness, as well as the top and bottom width of any intact handles, were collected using calipers and recorded in millimeters. The thickness of each sherd was consistently measured directly below the point of vertical tangency on the neck of each jar and above the shoulder (Figure 6). The mass of

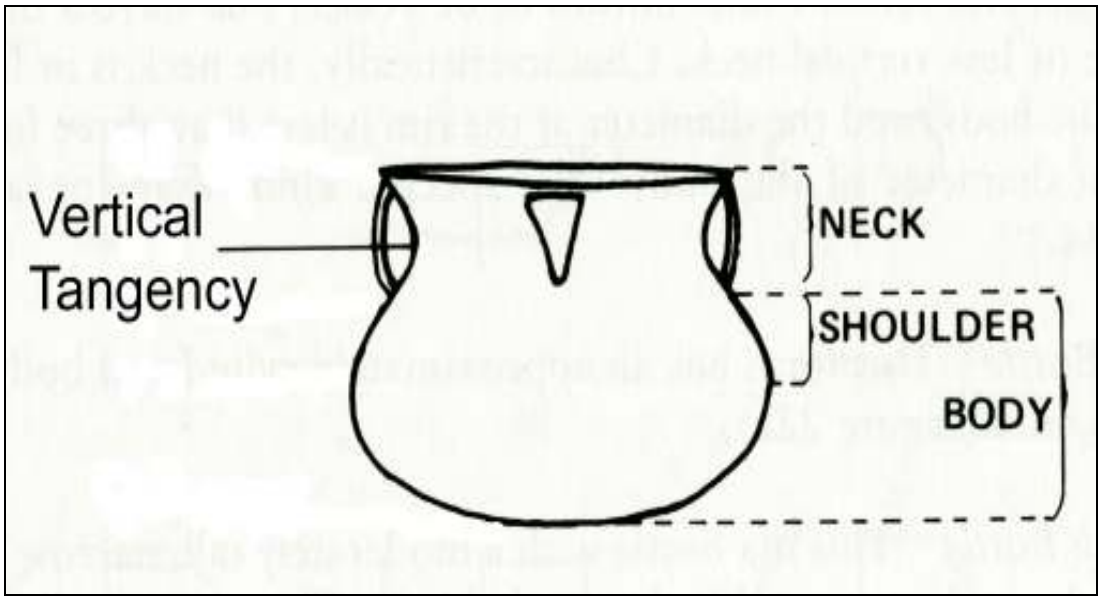

Figure 6. Example illustration of a standard jar showing point of vertical tangency upon the neck (adapted from Steponaitis 1983:Figure 21).

each sherd was weighed using an electronic scale and recorded in grams. Rim form (e.g., standard, folded, folded-flattened) was noted following criteria discussed by Steponaitis (1983:71-72; see also C. Scarry 1995:44-46).

The rim orifice diameter of each jar sherd was measured and the percentage of each rim's arc was recorded. Many studies have shown that rim orifice diameter is an accurate measure of a jar's size and volume (Blitz 1993b; Hally 1986; Plog 1985). In one study, Hally (1986:272) found a strong correlation between rim diameter and volume of Mississippian jars, and states, "orifice diameter can be used as an accurate measure of vessel size." A study by Blitz (1993b:85) of 17 complete jars from the Moundville site produced similar results. It is assumed that rim orifice diameter is an accurate measure of vessel size for jars from Mound W.

The diameter of each jar rim sherd was measured using a dial indicator (Plog 1985; see also Maxham 2000; Taft 1996). A dial indicator (Figure 7) functions by

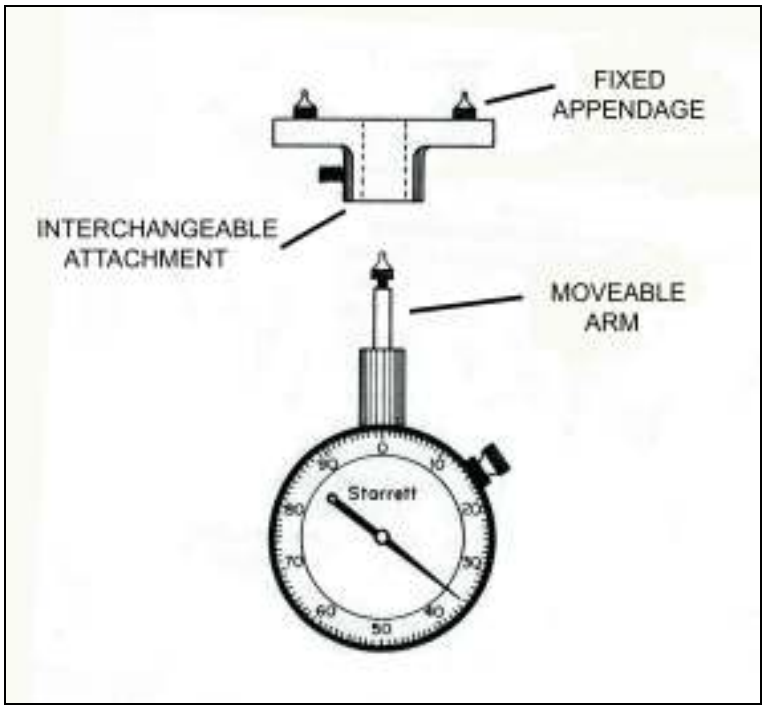

Figure 7. Example illustration of a dial indicator with interchangeable attachment (adapted from Plog 1985:Figure 10.2).

placing a fixed appendage with a known length (A) against two points along the arc of a rim sherd, then adjusting a movable arm that slides in or out perpendicularly from the center of the fixed appendage until it also rests upon the arc of the rim. The dial reads the adjusted length of the moveable appendage (B). The known length of the fixed appendage (A) and the measured length of the movable arm (B) represent the length of two known lines, as displayed in Figure 8. The diameter of the sherd can then be calculated by the equation (Plog 1985:245):

$$\text{diameter} = \frac{(A/2)^2 + (B)^2}{B}.$$

A Starrett dial indicator (model No. 25-F, with gradations of 0.001 inch) was used in this research to measure the outer diameter of each jar rim. Since the dial indicator

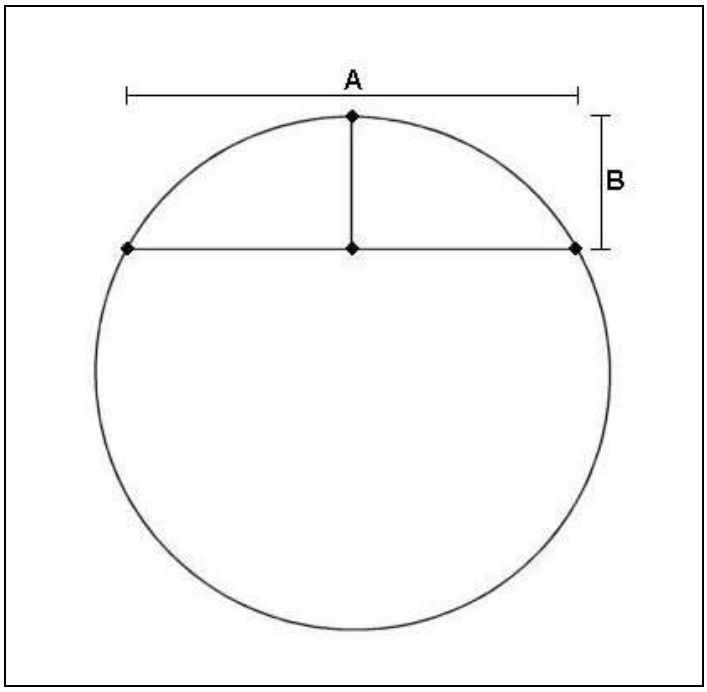

Figure 8. Example of lines A and B (after Plog 1985:Figure 10.1).

used in this project was read in inches, the quotient obtained from the equation above was converted to centimeters to correspond with conventional vessel orifice diameter reporting methods. Following Plog (1985), three separate points along each rim were measured and the mean distance was used to calculate the vessel's diameter.

For this project, I attached the dial indicator to a small vice anchored to a flat surface placed chest-high on a table (Figure 9). This ensured that the dial indicator remained stationary and horizontal to the table within my plane of sight. When measuring a sherd, I oriented the rim perpendicular to the table and fitted it against the stationary dial indicator. This method produced a stable measuring technique throughout the course of the project.

The standard method of estimating rim orifice diameter is curve-fitting on a diameter template (Rice 1987:222-224). Although curve-fitting is a common technique used by archaeologists, it has been noted that error can occur when more than one analyst

Figure 9. Photograph of dial indicator mounted on vice.

is involved in measuring (DeBoer 1980). Plog (1985) compared the measurements of a sample of sherds by several analysts using both a diameter template and a dial indicator. He found that significantly less error was present among the analysts' measurements when a dial indicator was used instead of the standard diameter template.

In addition to its greater accuracy, other factors necessitated the use of a dial indicator during this research. Curve-fitting on a diameter template becomes less accurate as the total percentage of a rim's arc decreases (DeBoer 1980:133). As noted earlier, Mound W's assemblage contains very large jars. Although many of these oversized jar rims were some of the largest sherds in the assemblage, many retain only a small percentage of their original arc (< 5 percent). As a result, it was impossible to read an orifice diameter measurement for the majority of these large jars using the curve-fitting method. The use of a dial indicator, however, allowed for the measurement of these oversized vessels.

Previous Research at Hog Pen Mound (1TU56)

Hog Pen Mound is a single-mound site located approximately 15 miles north of the Moundville site along the Black Warrior River (Figures 2 and 10). Hog Pen has been the location of three separate archaeological investigations. The first excavations at the site were conducted in 1978 by Christopher Peebles as part of a larger survey of the river valley (Bozeman 1982:59-75). During the 1978 field season, two one-by-one meter units were excavated on the northern slope of the mound. In 1990, the AMNH held its Summer Field Expedition at the site led by Paul Welch (Welch 1998). During that summer, additional units were excavated along the mound's northern slope and a midden was located along the eastern slope of the mound by the placement of three one-by-three meter units and a series of auger tests (Holland 1995). In 1992, Welch returned to Hog Pen once more to excavate the site's midden (Welch 1998).

The excavations at Hog Pen Mound produced ceramic debris from both mound fill and midden deposits. The ceramic chronology of the site ranges from at least the late Moundville I through the early Moundville II subphases (Welch 1998:150). In the Moundville political-economic model, Hog Pen Mound, along with a few other contemporaneous single-mound sites in the vicinity, is assumed to have been the residential locale of sub-elite administrators. In addition to being the locus of regional, ceremonial-ritual activities, Hog Pen would have served as an intermediary point for the flow of food surpluses and tribute from farmsteads to the paramount chief at Moundville (Knight and Steponaitis 1998:16; Welch 1998). According to this model, Hog Pen Mound's placement within the region's three-tiered settlement hierarchy suggests to many that the mobilization of foodstuffs was a central functioning component in the

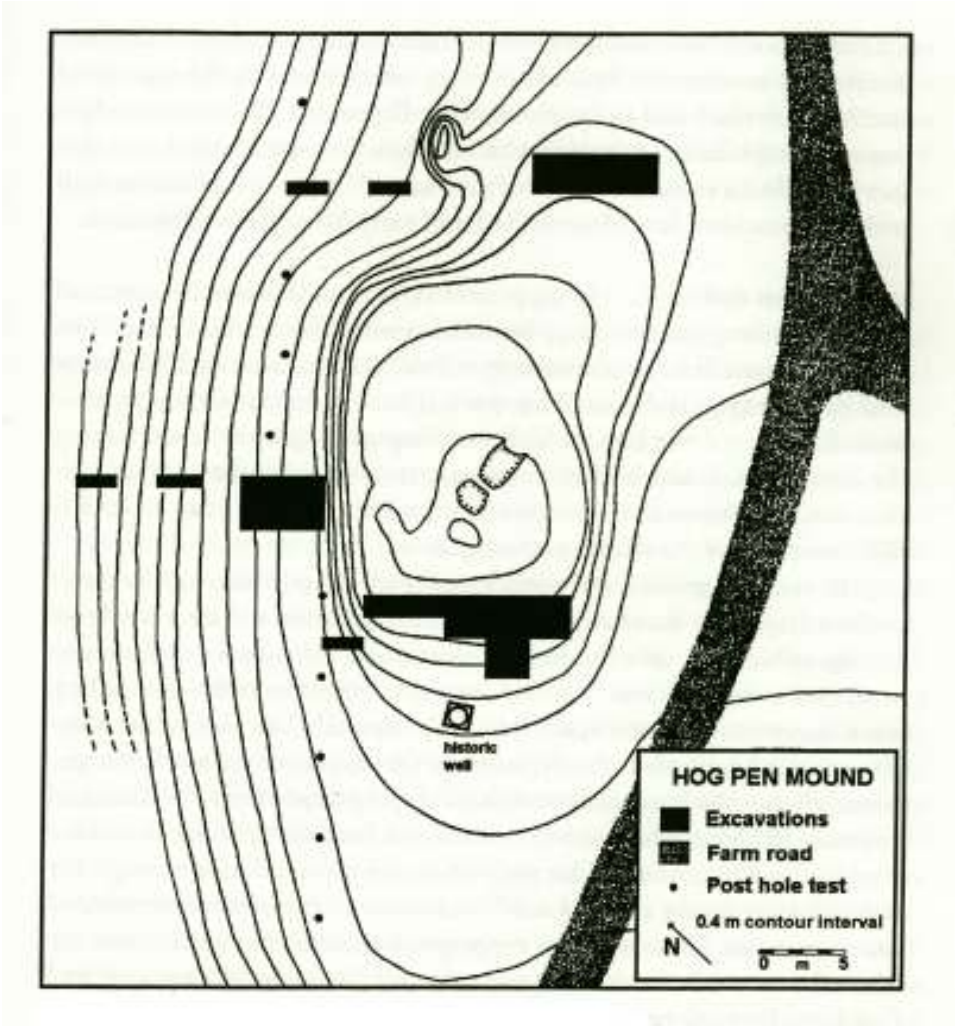

Figure 10. Map showing the Hog Pen Mound (1TU56) site (from Welch 1998:Figure 7.5).

political economy of the Moundville region at least as early as the late Moundville I subphase (Knight and Steponaitis 1998:16; Welch 1991:179-183). The ceramic assemblage from Hog Pen Mound was chosen as a primary comparative data set to the assemblage from Mound W. In addition to their similar chronological positions, the locations represent two integral levels of Moundville's proposed three-tiered, political-economic and settlement hierarchy models (Steponaitis 1978; Welch 1991).

Ceramic debris from Hog Pen Mound's midden is directly related to mound-top activities that occurred at the site (Welch and Scarry 1995:401). Ceramic data from Hog

Pen's midden were collected by Holland (1995). In her study, Holland classified Hog Pen's ceramic sherds according to Moundville's type-variety classificatory system (Steponaitis 1983). She also classified each rim sherd by form (i.e., jar, bowl, bottle) according to its diagnostic shape characteristics. The outer rim orifice diameter of analyzable rim sherds was measured by Holland using the curve-fitting method on a diameter template consisting of a series of concentric circles spaced at one-centimeter intervals.

Ceramic data from Hog Pen Mound are presented by Holland (1995:93-96) in appendix form. Among other variables, she reports type-variety, vessel form, and rim orifice diameter in centimeters for all analyzed rim sherds. I entered the data reported by Holland into an SPSS spreadsheet for comparison to Mound W's assemblage. Since my research is concerned solely with data from jars, only jars from Hog Pen were selected. Further, I chose to include only jars from Hog Pen of the same type-varieties that I identified at Mound W. These included jars of the Mississippi Plain and Moundville Incised types. These represent the majority (about 89 percent) of jars reported by Holland.

When measuring rim orifice diameter of vessels from Hog Pen Mound, Holland (1995) was sometimes able to confidently match the outer edge of rim sherds to a specific circle on her diameter template. In other cases, she was unable to accurately match rims to a specific circle. In those instances, she reported the absolute minimum and the absolute maximum diameter of rim sherds. I entered the absolute maximum diameter of those sherds into SPSS for comparison to Mound W's assemblage.

A comparison of vessel size data collected from Mound W and Hog Pen Mound (Holland 1995) will be utilized to discuss the extent of surplus food storage at the two locations. Data recorded from the two locations will be compared using a t-test. The t-test will determine the significance of any difference between the mean jar sizes for the two samples (Drennan 1996:155-159). The relative diversity of rim orifice sizes within each assemblage will also be explored to further assess any inter-assemblage variation.

It is necessary at this point to discuss my choice of using Hog Pen Mound as a comparative sample. Although it would have been ideal to compare Mound W's assemblage to a contemporary mound assemblage from the Moundville site itself, the lack of an adequate early mound assemblage at the Moundville site preempts such a comparison (John Blitz, personal communication 2005). On the other hand, the assemblages from Mound W and Hog Pen Mound do represent two distinct levels within Moundville's proposed political-economic and settlement hierarchy models (Knight and Steponaitis 1998; Peebles and Kus 1977; Steponaitis 1978; Welch 1991, 1998). In accordance, individuals living at the two locations would have assumed distinct economic, political, and social roles in their day-to-day affairs. Those living at Hog Pen Mound are assumed to have been high-ranking elite (Knight and Steponaitis 1998; Welch 1998; Welch and Scarry 1995). The Moundville site, however, was home to both elites and commoners prior to the late Moundville II subphase (Knight and Steponatis 1998; Steponaitis 1998). It is suggested that the elite and their kin lived atop or directly adjacent to mounds at the site, whereas commoners lived in the areas of the site between the plaza-mound group and the palisade (Knight 1998, 2004; Peebles 1971, 1983;

Steponaitis 1998) (Figure 11). Therefore, I feel justified constructing this research within the parameters of the Moundville political-economic model as it is currently defined.

Methods for Identifying Mound W Vessel Forms

As noted earlier, my analysis of Mound W's ceramic assemblage was conducted in two major segments. The discussion above detailed a modal analysis that was conducted during May and June of 2006 in order to collect vessel size data for comparison to Hog Pen Mound's vessel assemblage. After this work was completed, it was determined that a fundamental issue concerning Mound W still remained open to

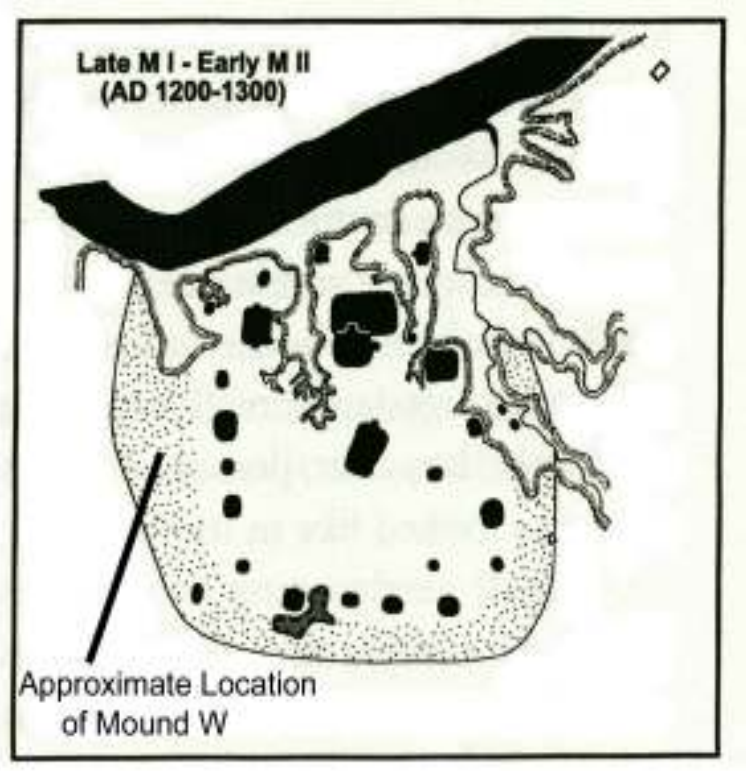

Figure 11. Map showing proposed settlement at Moundville during the Late Moundville I and Early Moundville II subphases (adapted from Knight and Steponaitis 1998:Figure 1.3).

consideration. Johnson's (2005) examination of Mound W's artifact assemblage and excavation records led her to conclude that Mound W served as a domestic, residential area at early Moundville. Another recent study at Moundville provides a detailed look at several other domestic locales uncovered in the 1930s Roadway Excavations at the site (Wilson 2005). Mound W's size, age, remains, and location suggests that it is comparable to these other domestic areas. However, the possibility remained that the Mound W ceramic assemblage might represent an anomaly or special-purpose deposit distinct from other residential domestic areas. I needed to determine if Mound W's ceramic assemblage was comparable to other samples from domestic areas. If so, results from this research documenting surplus storage at Mound W may be suggestive of storage practices at other domestic areas at the Moundville site. In order to further assess the relationship between Mound W and other domestic locales at Moundville, additional analysis of Mound W's ceramic assemblage was conducted during October and November of 2006.

The purpose of the second segment of analysis was to classify all identifiable rim sherds from Mound W's ceramic assemblage by vessel form according to diagnostic shape characteristics. In his discussion of Moundville ceramics, Steponaitis (1983:64-70) describes three general ceramic forms: jars, bowls, and bottles. Figure 12 presents an illustration of these basic vessel shapes. Diagnostic shape characteristics of Moundville vessels as defined by Steponaitis were used as sorting criteria in this research. Following, is a brief description of these basic characteristics.

Jars have a globular body with a wide, but somewhat restricted, neck. The orifice of a jar's rim is greater than three-fourths the maximum diameter of its body. Steponaitis

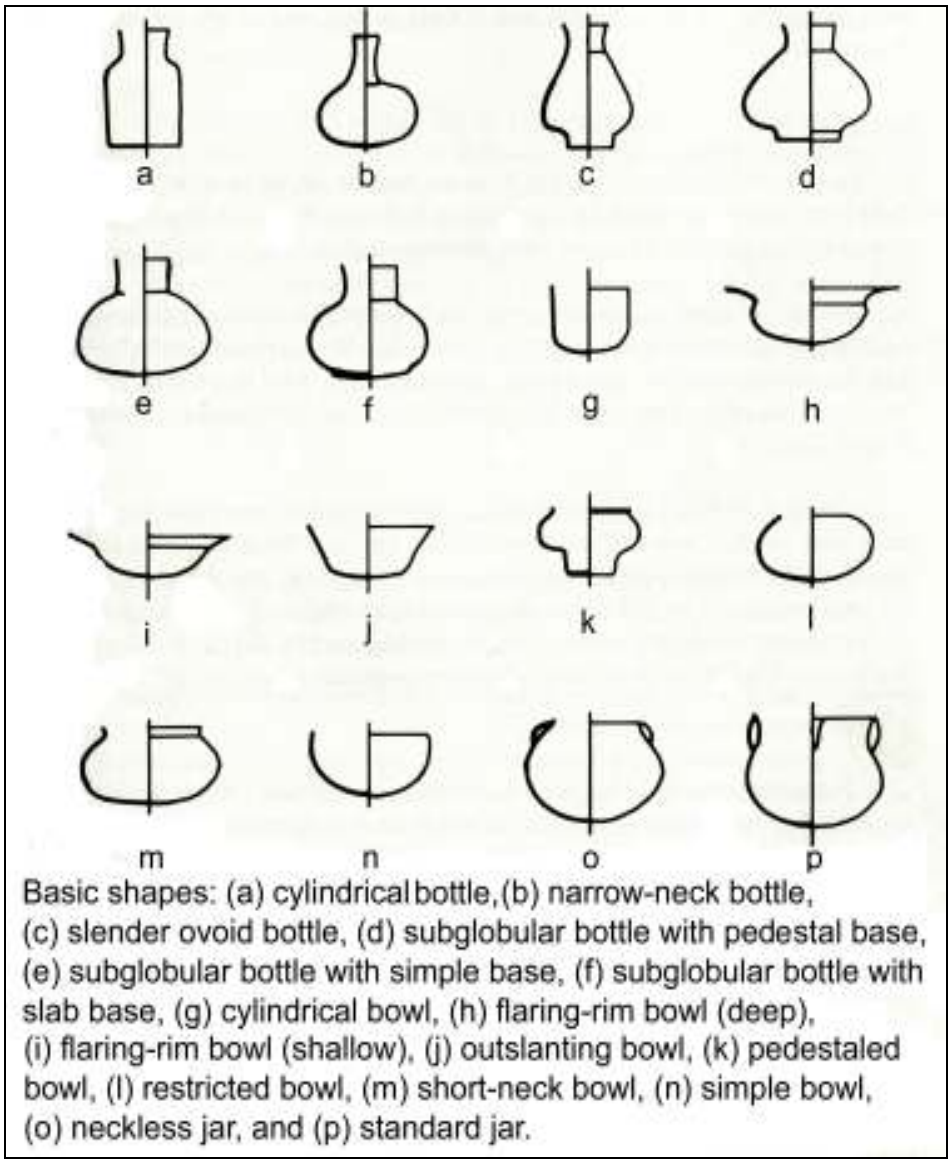

Figure 12. Illustration of basic vessel shapes at Moundville (adapted from Steponaitis 1983:Figure 22).

distinguishes between neckless and standard jars (Figure 12o-p). Bowls generally have no neck at all. Some Moundville bowls do, however, contain a short and vertical neck, an everted lip, or an out-flaring rim. Most bowls are at least twice as wide as they are tall. Steponaitis defines several different bowl forms (Figure 12g-n). Of importance to this research is the flaring-rim bowl (Figure 12h-i). Flaring-rim bowls are hemispherical vessels with accentuated out-flaring rims. Bottles generally have a vertical and highly

constricted neck that is often one-third the height of its body. A bottle's rim diameter is generally less than three-fourths the maximum diameter of its body. Steponaitis distinguishes between several bottle forms (Figure 12a-f).

For this project, all identifiable rim sherds from Mound W's ceramic assemblage were sorted by vessel form according to diagnostic shape characteristics defined by Steponaitis (1983). Rims were identified as jars, bowls, flaring-rim bowls, or bottles. Any rims that could be refitted together were considered one sherd. All rim sherds too fractured or eroded for proper identification were listed as unidentifiable.

Previous Work at Moundville: Moundville's Roadway Excavations

In his study of Moundville's Roadway Excavations, Wilson (2005) was able to delineate several spatially discrete, off-mound domestic areas composed of tightly clustered residential structures (Figure 13). Wilson's examination of these residential groups showed that most areas were originally occupied during the Early Moundville I subphase, and continued to serve a residential function through much of the Early Moundville II subphase. During the late Moundville II and Moundville III phases, these areas were reused as cemeteries. Johnson (2005) suggests a similar chronology and history of use at Mound W. A more detailed comparison of Mound W's ceramic assemblage to those from other residential groups at Moundville will help to further define the kinds of activities that occurred there.

Wilson (2005) analyzed ceramic remains from five residential groups at Moundville. He classified rim sherds by form (i.e., jar, bowl, flaring-rim bowl, and bottle) according to diagnostic shape characteristics as defined by Steponaitis (1983), and

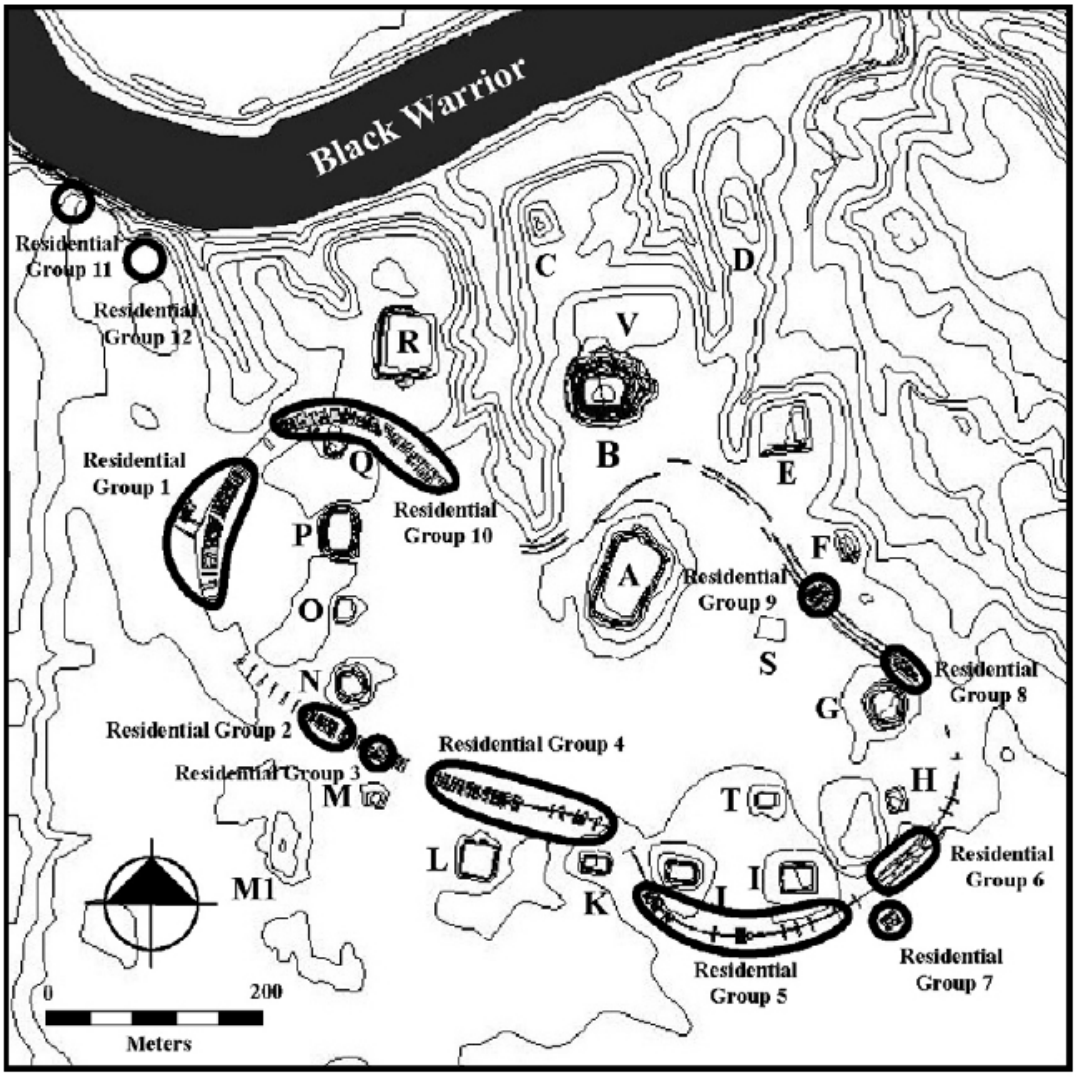

Figure 13. Map showing identified residential groups at Moundville (from Wilson 2005:Figure 6.13).

presented all data in appendix form (Wilson 2005:207-262). I entered Wilson's data into SPSS for comparison to Mound W's assemblage.

Several researchers have noted that attributes of vessel shape are related to the intended use of a vessel (Braun 1983; Hally 1986; Nelson 1981; Shapiro 1983, 1984; Steponaitis 1983). A similar range of activities occurring at different locations should produce similar frequencies of vessel forms across those assemblages. If Mound W was

indeed a residential area at Moundville, then it is plausible to posit that the range of activities that occurred at other residential groups at the site were similar to the range of activities carried out by the inhabitants of Mound W. If so, the frequencies of vessel forms at Mound W should be similar to the frequencies reported by Wilson (2005). I will use chi-square tests to assess the relationship between the proportional frequencies of vessel forms within the ceramic assemblages from Mound W and other residential groups at Moundville (Drennen 1996:187-194). If Mound W's assemblage differs little from other residential assemblages, then it can be argued that similar activities produced the material remains of the locations compared. The results of these measurements are presented in Chapter 4.

Notes

1. Most of the vessels at Moundville that resemble the Barton Incised type contain incised arches below rectilinear designs. These vessels are shell tempered, unburnished wares. Knight (personal communication 2006) has recently discussed Moundville vessels with this decorative motif. He has chosen to classify these not as Barton Incised, but as Moundville Incised *var. Oliver*. When I encountered similar vessels during my analysis, I followed Knight and classified them as Moundville Incised *var. Oliver*.

CHAPTER 4
RESULTS

In the previous chapter, a discussion of the archaeological materials utilized in this research was given and methods of analysis were detailed. In this chapter I present the results of that analysis. The main objective of the analysis is to address the organization of surplus production in the early Moundville polity. Using jar size as a measure of storage, I compare food storage capacities between Mound W and the proposed elite context at the Hog Pen Mound site. Additionally, I discuss the comparability of Mound W to other off-mound residential areas at Moundville by considering formal similarities between their overall ceramic assemblages.

Following the organization of Chapter 3, this chapter is divided into two main sections. The first section presents the results of a modal analysis that collected vessel size data from Mound W's jars for comparison to similar jar size data published for Hog Pen Mound (Holland 1995). Following a presentation of jar size data from both locations, inter-assemblage comparisons are conducted. The second section presents the results of an additional analysis of Mound W's ceramic assemblage conducted to reveal the relative proportional frequencies of vessel forms that compose the assemblage. The results of a similar analysis conducted on ceramic remains recovered from Moundville's roadway (Wilson 2005) are then summarized, followed by inter-assemblage comparisons. The purpose of these inter-assemblage comparisons is to determine if the range of

ceramic-using activities at Mound W was similar or different from ceramic-using activities at other off-mound residential areas at Moundville.

The Distribution of Jar Sizes in the Moundville Region

The Distribution of Jar Sizes at Mound W and Hog Pen Mound

The first segment of analysis was conducted to collect size data from jars recovered from Mound W. Rim orifice diameter is considered a measure of jar size and used as a proxy to identify food storage (Blitz 1993b; Hally 1986; Steponaitis 1983). This section presents the results of that analysis. Data from other measurements conducted during that analysis are presented in the appendix.

As described in Chapter 3, all jar rim sherds suitable for analysis were selected from Mound W's total ceramic assemblage. Jar rims too badly eroded or fractured were not included. A total of 502 jar rim sherds from Mound W were analyzed. Rim orifice diameter was measured on 432 (86.1 percent) of those jar rims. The diameters of jar rims from Mound W are widely distributed (Table 2 and Figure 14). The minimum diameter at Mound W is 11 cm and the maximum diameter is 183 cm, spanning a range of 172 cm. The mean rim orifice diameter is 41.0 cm, and the median equals 33.0 cm. The distribution has a standard deviation of 25.6 cm.

Holland (1995) measured the rim orifice diameter of jars from Hog Pen Mound. Data she collected are used as a comparative set to the data collected from Mound W. A total of 59 jar rim sherds from Hog Pen Mound were selected for comparison to Mound W's jar assemblage, following the selection criteria stated in Chapter 3. The minimum

Table 2. Rim Diameters of Jars from Mound W, Moundville

Rim Diameter in Centimeters	N	%	Cum. %
Mound W, Moundville			
11-20	39	9.0	9.0
21-30	144	33.3	42.4
31-40	107	24.8	67.1
41-50	51	11.8	78.9
51-60	24	5.6	84.5
61-70	23	5.3	89.8
71-80	11	2.5	92.4
81-90	10	2.3	94.7
91-100	5	1.2	95.8
101+[1]	18	4.2	100.0
Total	432	100.0	

[1] min = 102 cm, max = 183 cm

rim diameter at Hog Pen is 13 cm and the maximum rim measured 58 cm, spanning a total range of 45 cm (Figure 14). The mean rim orifice diameter of jars from Hog Pen Mound is 34.9 cm, and the median diameter equals 36.0 cm. The distribution has a standard deviation of 12.6 cm.

Inter-Assemblage Comparison of Jars Sizes at Mound W and Hog Pen Mound

A comparison of the Mound W and Hog Pen Mound jar assemblages will highlight any variation in the use of jars in the two locations (Alt 2001:153; Blitz 1993b; DeBoer and Lathrap 1979; Douglas and Rathje 2001). Differences in jar size between the two groups may be considered indicative of the relative amounts of surpluses that were stored at those locations (Blitz 1993b). It is assumed that the presence of significantly larger jars at any one location suggests more surpluses were stored there.

Data from Mound W and Hog Pen Mound show that Mound W contained larger jars (Figure 14). A comparison of means using a t-test shows that this difference is

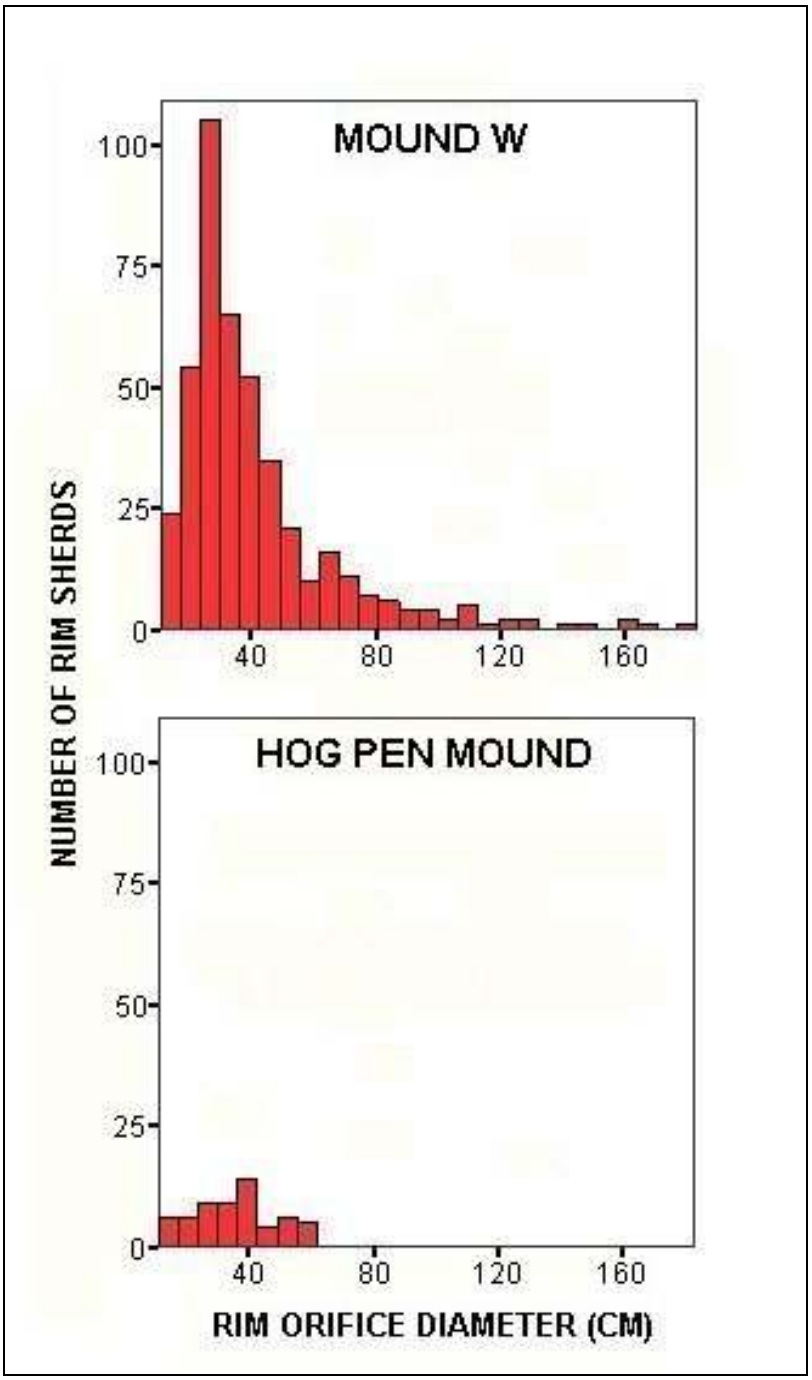

Figure 14. Histograms showing jar rim diameters from Mound W (top) and Hog Pen Mound (bottom).

significant ($t = 3.0$; $df = 136.6$; $p = .003$) (Figure 15). To ensure the difference between the two sample sizes ($N_{Mound\ W} = 432$; $N_{Hog\ Pen} = 59$) is not affecting the comparison, I randomly selected 59 jar rims from Mound W's sample using a random number generator

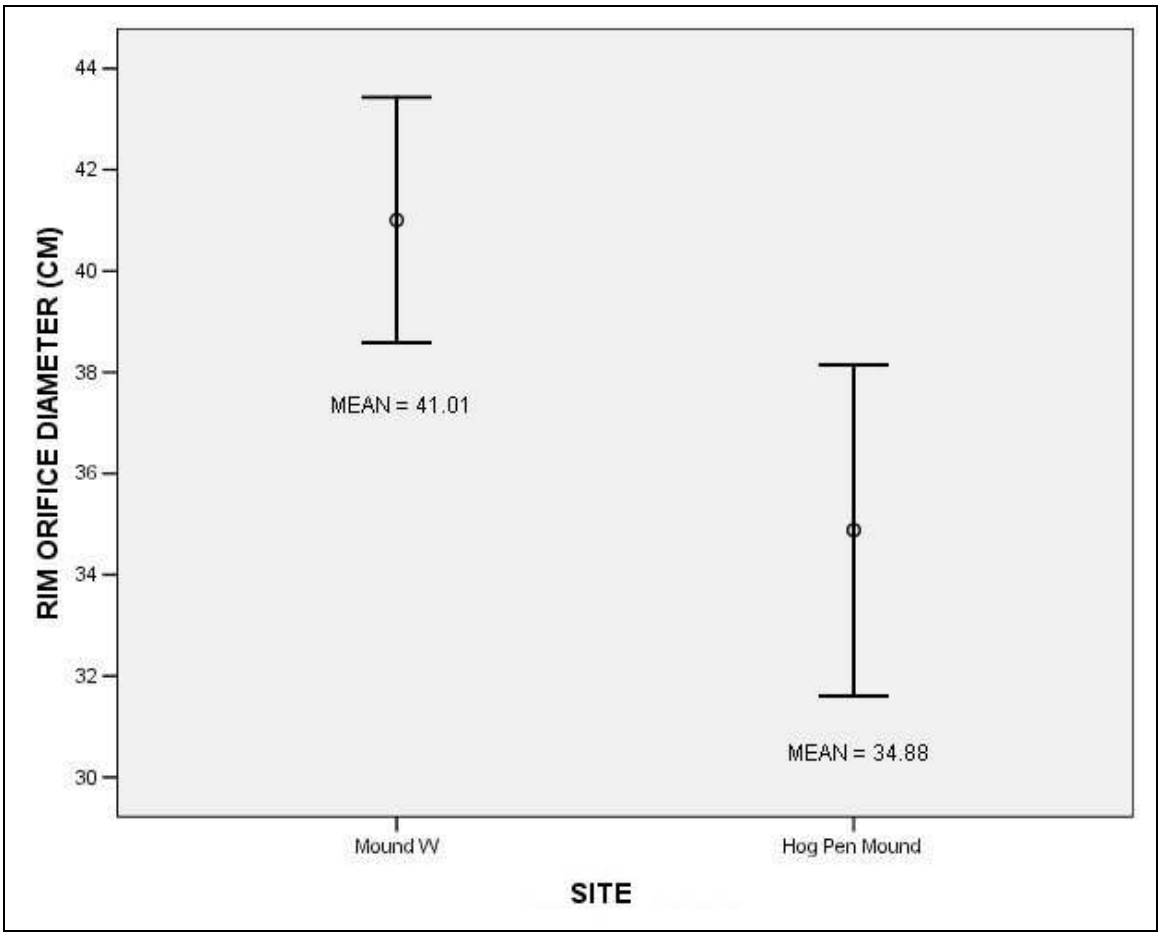

Figure 15. Error bar plot showing mean and 95 percent confidence interval of rim orifice diameters from Mound W and Hog Pen Mound.

in SPSS. This sub-sample of 59 rim sherds from the Mound W assemblage has a mean rim orifice diameter of 42.9 cm, a median of 36.0 cm, and a standard deviation of 26.8 cm. I then compared these 59 rims to the 59 rims from Hog Pen Mound. The second t-test confirms that Mound W has significantly larger jars than Hog Pen Mound ($t = 2.082$; $df = 82.331$; $p = .04$). Knowing this, it seems necessary to gauge how much of this quantitative variation can be explained by the presence of large storage jars.

Oversized jars are present in both the Mound W and Hog Pen Mound ceramic assemblages. While analyzing Mound W's jars, I identified oversized jars by the presence of a uniquely thickened rim, noted by other researchers as possibly diagnostic of

these vessels (C. Scarry 1995; Welch and Scarry 1995; Wilson 2005) (Figure 16). A total of 111 oversized jar rims were positively identified and measured from Mound W (Table 3 and Figure 17). Taken as a subset, these 111 oversized rims had diameters that spanned from 40 cm to 183 cm, producing a mean diameter of 73.3 cm and a median diameter of 63.0 cm. The rim diameter distribution of oversized jars at Mound W overlaps with the distribution of normal jars (Figure 18). Rim sherds, as well as suspected body and basal sherds, of oversized jars from Mound W show no traces of sooting or oxidation, and no handles are present on oversized jar rims. Therefore, evidence from Mound W strengthens the argument that oversized jars were used to store surplus foods (C. Scarry 1995:49; Welch and Scarry 1995:410; Wilson 2005:157-159).

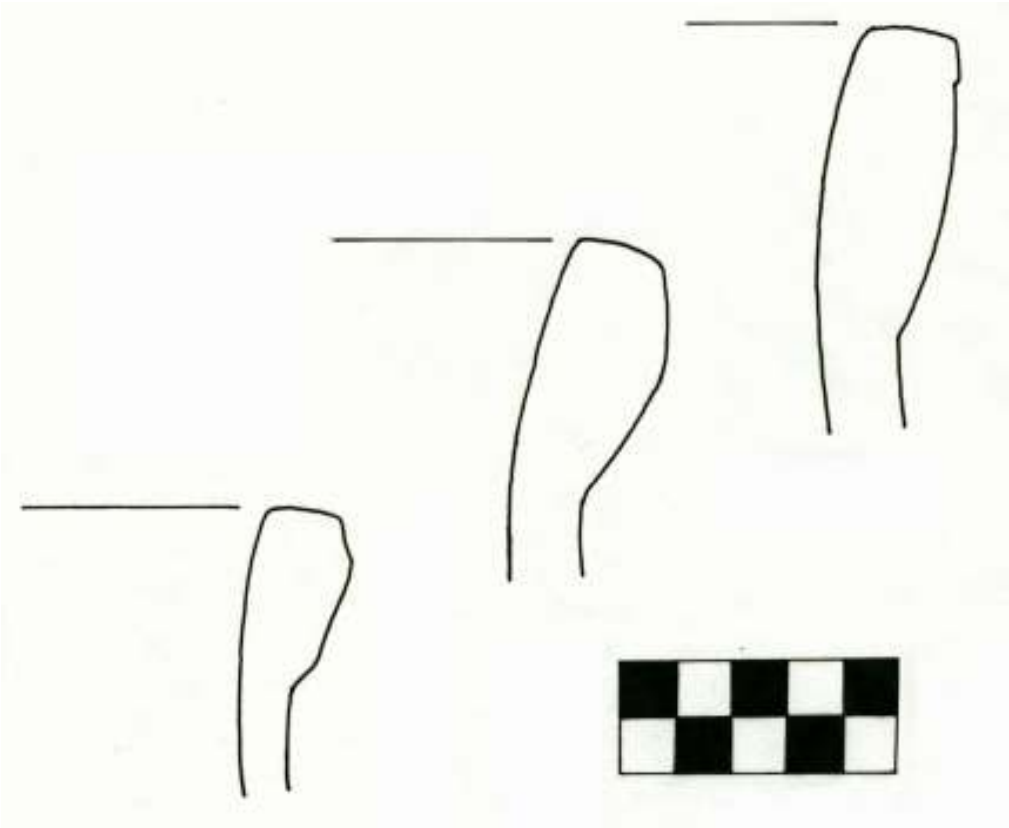

Figure 16. Profile drawings of oversized jar rims from Mound W (scale in cm).

Table 3. Rim Diameters of Oversized Jars from Mound W, Moundville

Rim Diameter in Centimeters	N	%	Cum. %
Mound W, Moundville			
40-49	19	17.1	17.1
50-59	27	24.3	41.4
60-69	18	16.3	57.7
70-79	14	12.6	70.3
80-89	9	8.1	78.4
90-99	5	4.5	82.9
100-109	5	4.5	87.4
110-119	4	3.6	90.1
120-129	3	2.7	93.7
130-139	1	0.9	94.6
140-149	2	1.8	96.4
150-159			
160-169	3	2.7	99.1
170-179			
180-189	1	0.9	100.0
Total	111	100.0	

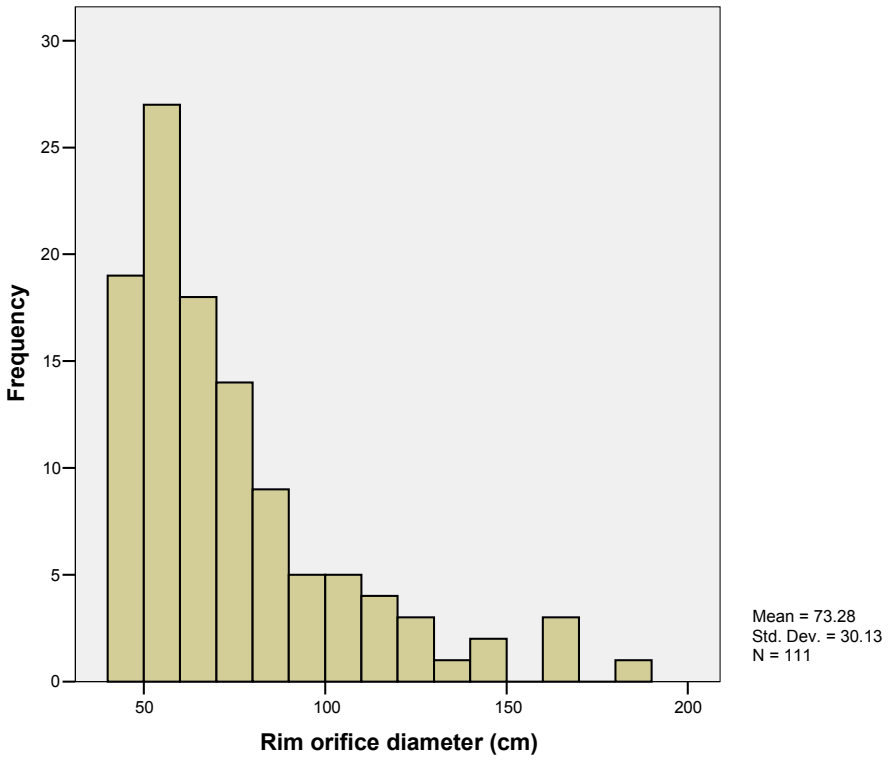

Figure 17. Histogram showing oversized jar rim diameters from Mound W, Moundville.

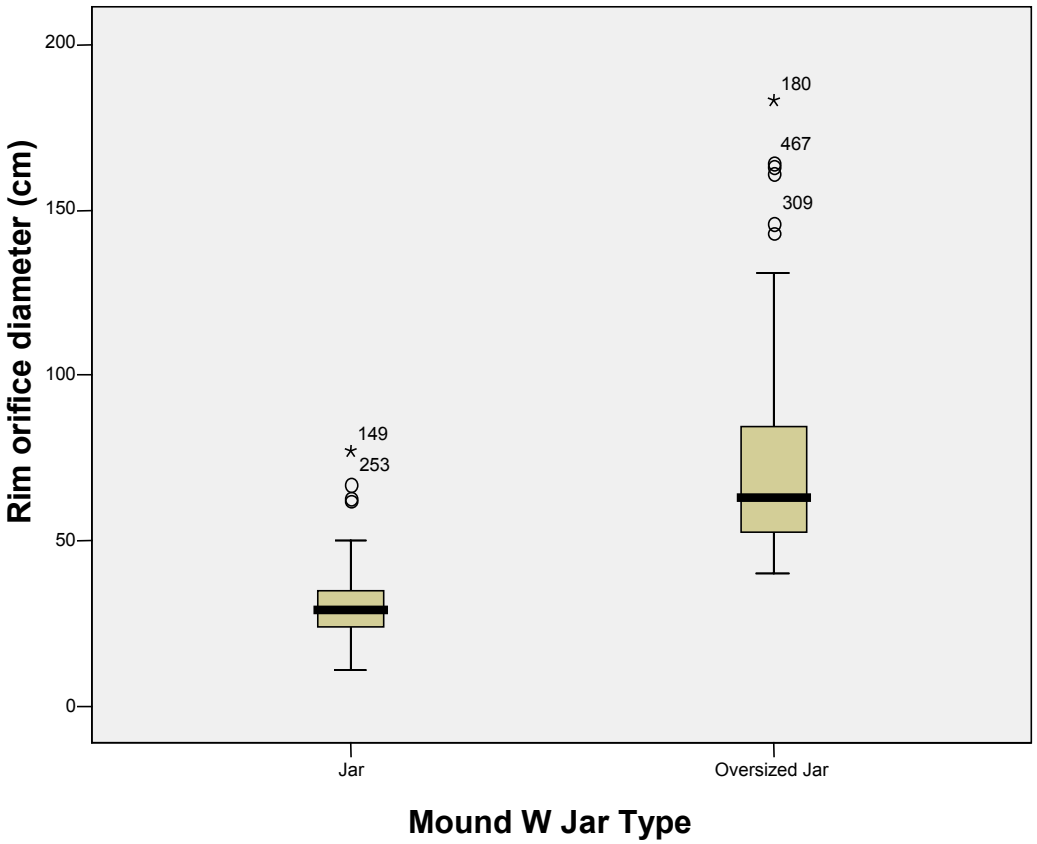

Figure 18. Box plots showing rim diameter distributions of jars and oversized jars from Mound W, Moundville.

Holland (1995:73) notes the presence of oversized jars in Hog Pen Mound's assemblage. I was unable, however, to determine what entries in her appendix correspond to these rims. Due to this, I define any jar from Hog Pen with a rim diameter of at least 50 cm an oversized jar (see Welch and Scarry 1995:410). Following this tentative assumption, Hog Pen Mound's assemblage contains approximately 11 oversized jar rims that average about 54 cm in diameter.

When oversized jars are removed from both the Mound W and Hog Pen Mound samples, no size differences between the distributions remain (t = -.473; df = 367; p = .637). The mean rim diameter of normal jars from Mound W and Hog Pen Mound are

29.9 cm and 30.5 cm, respectively. Therefore, it can be argued that the differences between the two assemblages can be explained by the presence of oversized jars that served to store surplus foods. These data suggest that the inhabitants of Mound W stored significantly greater amounts of surpluses than did the proposed administrative elite inhabitants of Hog Pen Mound.

The Distribution of Vessel Forms at Off-Mound Locations at Moundville

The data presented above are considered evidence that the inhabitants of Mound W stored greater amounts of surplus foods than the inhabitants of Hog Pen Mound. This discovery raised an additional question: is Mound W representative of off-mound residential deposits in the early Moundville community, or is it a special-purpose deposit or similar anomaly? Johnson's (2005) examination of Mound W's artifact assemblage and excavation records led her to conclude that Mound W served as a domestic, residential area at early Moundville. Another recent study at Moundville provides a detailed look at several other domestic locales uncovered in the 1930s roadway excavations at the site (Wilson 2005). As noted earlier, Mound W's size, age, remains, and location suggests that it is comparable to these other domestic areas. Therefore, I wanted to determine if Mound W's ceramic assemblage was comparable to other samples from contemporary off-mound domestic areas. If so, Mound W cannot be considered an anomaly or special-purpose deposit distinct from other residential domestic areas at Moundville. The remainder of this chapter presents the results of a vessel form analysis of Mound W's ceramic assemblage, followed by inter-assemblage comparisons to off-mound residential assemblages reported by Wilson (2005).

Vessel Forms at Mound W, Moundville

The entire ceramic assemblage from Mound W is composed of 16,781 specimens, consisting mainly of body, basal, and rim sherds (Johnson 2005). Of the total number of specimens, 2,464 (14.7 percent) are rim sherds. All rim sherds were inspected for the purpose of vessel form identification (see Steponaitis 1983:64-70). A total of 600 rim sherds, or 24.4 percent of all rims, were too fractured or eroded for proper identification. These 600 rims were listed as unidentified. In all, 1,864 rim sherds retained sufficient diagnostic shape criteria that allowed for proper identification. These identified rims make up 11.1 percent of Mound W's total ceramic assemblage (Table 4).

Jars are the most common vessel form present in Mound W's assemblage. In all, 1,391 jar rims were identified. This number represents 74.6 percent of all identified rims. Figure 19 shows profile illustrations of jars rims from Mound W. These illustrated profiles represent only a sample of the range of shapes witnessed of jars at Mound W and should not be taken as representative of all jar shapes. The ubiquity of jars in Moundville assemblages and their functions as storage, cooking, and serving vessels bespeaks of a diversity of jar shapes. Also, jars are suspected to show some diachronic morphological variation (C. Scarry 1995; Steponaitis 1983).

Bowls are the second most common vessel form present in Mound W's assemblage. Despite this, identified bowls rims number only 322. This number composes 17.3 percent of all identified rims. Figure 19 shows profile illustrations of bowl rims from Mound W. Like jars, these profiles do not represent all bowl shapes. As can be seen from Figure 12, Moundville bowls were constructed in many shapes and sizes, assumedly indicative of their diverse roles in both domestic and extra-domestic

Table 4. Frequency and Percentage of Vessel Rims by Form per Location at Moundville.

Vessel Form	Location											
	Mound W		Res. Group 1*		Res. Group 5*		Res. Group 7*		Res. Group 8*		Res. Group 10*	
	N	%	N	%	N	%	N	%	N	%	N	%
Jars	1391	74.6	228	65.7	44	69.8	95	53.7	587	70.6	396	75.0
Bowls	322	17.3	70	20.2	12	19.0	49	27.7	152	18.3	54	10.2
Flaring-Rim Bowls	133	7.1	42	12.1	7	11.1	21	11.9	79	9.5	65	12.3
Bottles	18	1.0	7	2.0	0	0.0	12	6.8	13	1.6	13	2.5
Total	1864	100.0	347	100.0	63	100.0	177	100.0	831	100.0	528	100.0

* data from Wilson (2005)

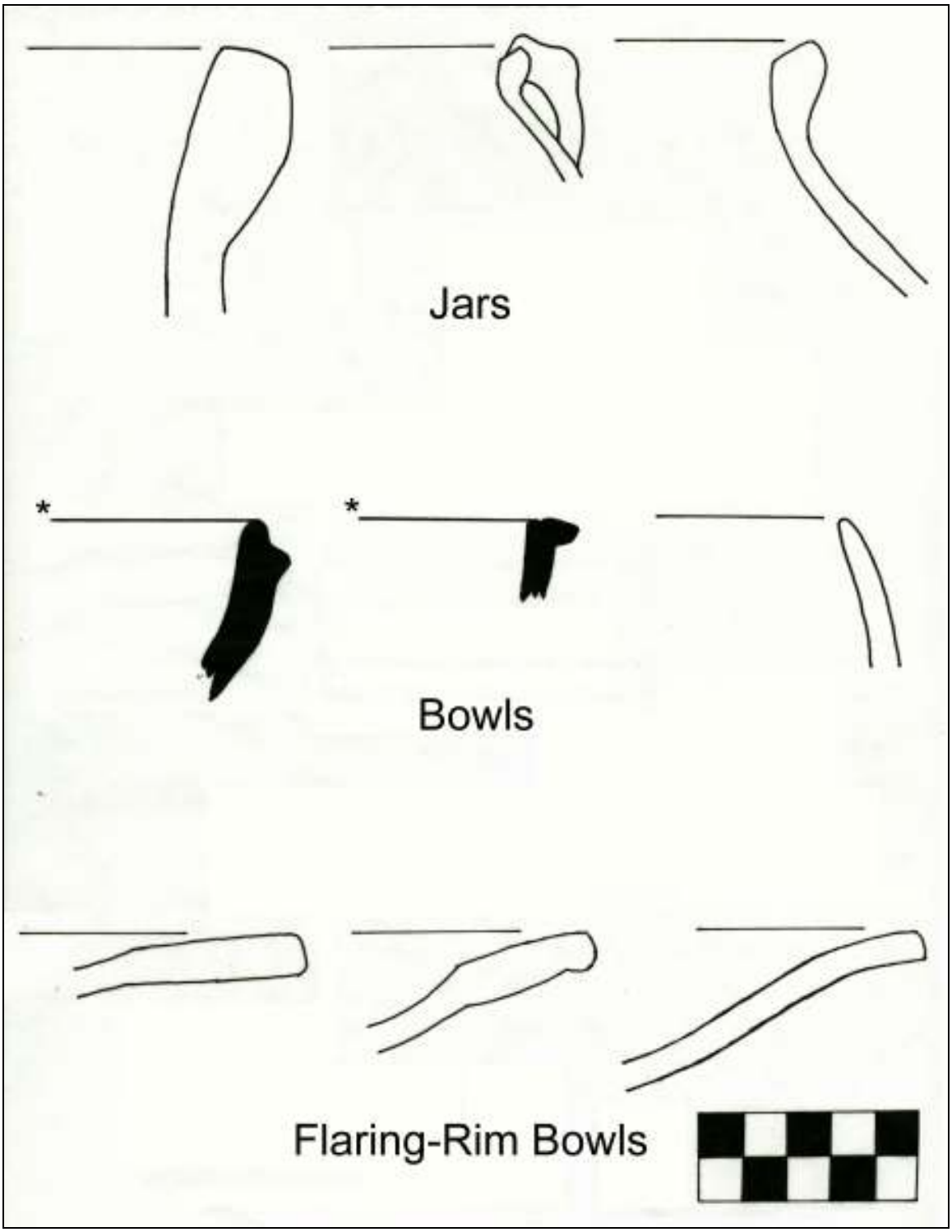

Figure 19. Profile drawings of rim sherds from Mound W (scale in cm) (* shaded profiles illustrated by Krista Garcia).

affairs. It should also be noted that flaring-rim bowls are not included in the overall bowl category. Flaring-rim bowls are discussed next.

Flaring-rim bowl rims number 133 in Mound W's assemblage. These rims represent 7.1 percent of all identified rims. Figure 19 shows profile illustrations of flaring-rim bowl rims from Mound W. As can be seen from the profile drawings, flaring-rim bowls are somewhat shallow, platter-like vessels with sharply out-flaring rims. These bowls are assumed to have served primarily as food serving vessels (Wilson 2005:167-169). Welch and Scarry (1995:411-414) suggest that flaring-rim bowls were likely used as food serving containers during public presentations. Assumedly, smaller flaring-rim bowls may have been used as individual serving platters, while larger flaring-rim bowls may have serviced small groups of gathered individuals.

Bottles are the least frequently occurring vessel form in Mound W's assemblage. In all, a total of 18 specimens were identified as bottles. This number composes only 1.0 percent of all identified rims. Bottles are assumed to have served as liquid serving containers for small groups or individuals (Wilson 2005:175-176).

Vessel Forms from Moundville's Roadway

Wilson (2005) presents ceramic data from several off-mound residential locations from Moundville's Roadway Excavations. Figure 13 shows the location of all residential groups that he discussed. Wilson analyzed rim sherds and sorted them by vessel form according to their diagnostic shape characteristics as defined by Steponaitis (1983:64-70). Vessel data from residential groups 1, 5, 7, 8, and 10 are presented by Wilson (2005:207-262) and are used herein as comparative samples to the assemblage from Mound W.

These residential groups represent off-mound locations distributed across Moundville in the northern, southern, eastern, and western portions of the site.

In all, Wilson (2005) was able to identify the vessel form of 1,946 rim sherds from the five assemblages that he analyzed. It should be noted, however, that only the assemblages from residential groups 7 and 8 were analyzed in their entirety. Only a sub-sample of the assemblages from residential groups 1, 5, and 10 were analyzed. A discussion of the data from each residential group follows.

Residential Group 1. Residential Group 1 (RG1) is located in the western portion of the Moundville site (Figure 13). It is situated west of mounds O and P, in close proximity to where Mound W was located. The RG1 assemblage contains a total of 228 jars (65.7 percent), 79 bowls (20.2 percent), 42 flaring-rim bowls (12.1 percent), and seven bottles (2.0 percent) (Table 4).

Residential Group 5. Residential Group 5 (RG5) is located in the southern portion of the Moundville site (Figure 13). It is situated south of mounds I and J. The RG5 assemblage contains a total of 44 jars (69.8 percent), 12 bowls (19.0 percent), seven flaring-rim bowls (11.1 percent), and no bottles (Table 4).

Residential Group 7. Residential Group 7 (RG7) is located in the southeastern portion of the Moundville site (Figure 13). It is situated south of Mound H and southeast of Mound I. The RG7 assemblage contains a total of 95 jars (53.7 percent), 49 bowls (27.7 percent), 21 flaring-rim bowls (11.9 percent), and 12 bottles (6.8 percent) (Table 4).

Residential Group 8. Residential Group 8 (RG8) is located in the eastern portion of the Moundville site (Figure 13). It is situated northeast of Mound G. The RG8

assemblage contains a total of 587 jars (70.6 percent), 152 bowls (18.3 percent), 79 flaring-rim bowls (9.5 percent), and 13 bottles (1.6 percent) (Table 4).

Residential Group 10. Residential Group 10 (RG10) is located in the northern and northwestern portions of the Moundville site (Figure 13). It is situated north and east of Mounds Q and south of Mound R. The RG10 assemblage contains a total of 396 jars (75.0 percent), 54 bowls (10.2 percent), 65 flaring-rim bowls (12.3 percent), and 13 bottles (2.5 percent) (Table 4).

Mound W and Residential Group Inter-assemblage Comparisons

Comparing Mound W's assemblage to those from other off-mound locations at Moundville should highlight any patterns in the relative proportional frequencies of vessel forms across the site. It is assumed that a similar range of activities that required the use of ceramic vessels would have produced similar ceramic assemblages. Thus, it is argued that if Mound W was a residential group, as suggested by Johnson (2005), then the proportional frequencies of vessel forms at Mound W should be similar to those reported for other off-mound residential locations by Wilson (2005).

Table 4 presents all data from Mound W and residential groups 1, 5, 7, 8, and 10. The bar graphs in Figure 20 show the relative proportional frequencies of vessel forms across each location. It can be seen that the ceramic assemblages from all groups are composed of similar proportions of jars, bowls, flaring-rim bowls, and bottles. The distributional frequencies of all vessel forms at each location appear to follow a similar pattern.

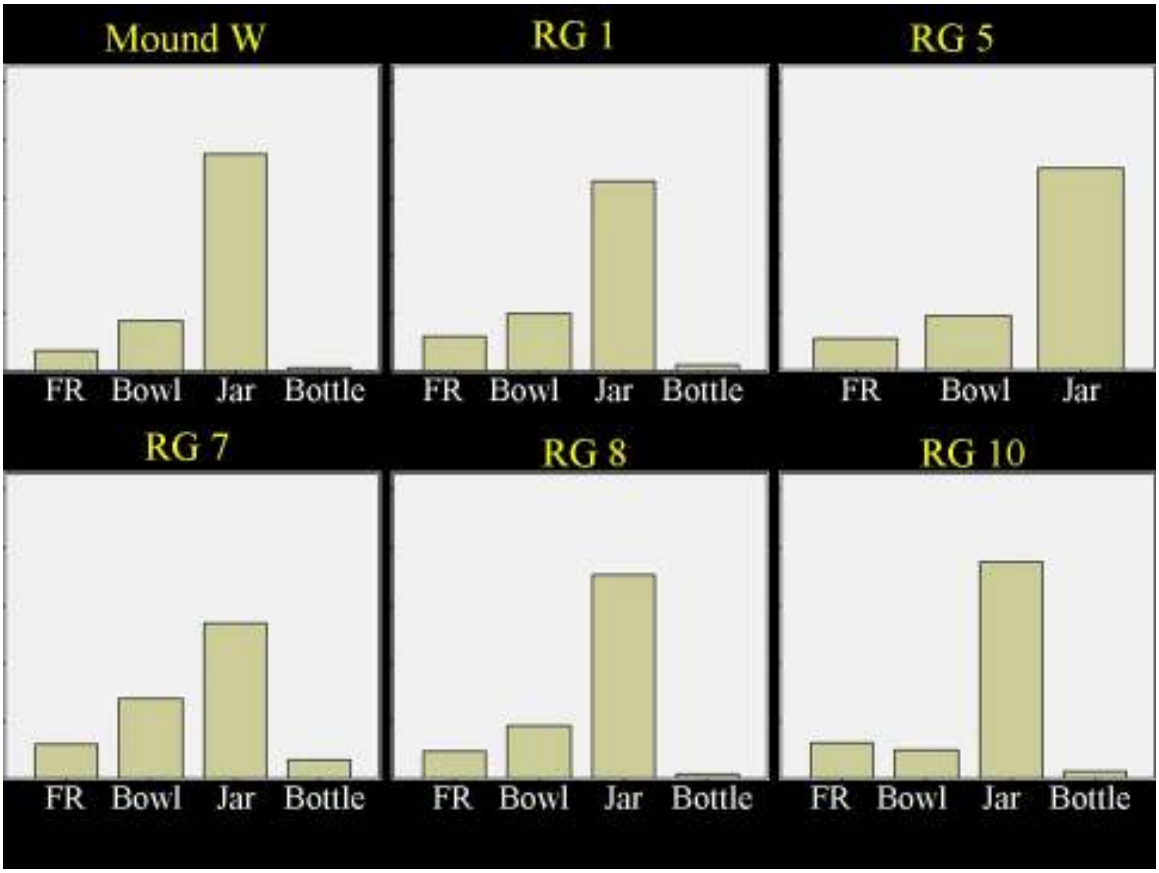

Figure 20. Bar graphs showing percentages of vessel forms at each location.

Two minor exceptions to this trend are present. No bottles were identified from RG5. Several reasons may explain this absence of bottles. First, RG5 contains a much smaller sample size (n=63) than any other group, a possible sampling error that may affect the visibility of this vessel form. For example, only 18 bottles were positively identified at Mound W from a total of 1,864 identified rim sherds, representing only 1.0 percent of all identified rims from the assemblage. Also, bottle rims are difficult to identify from an assemblage composed of sherds. It is assumed that some bottle rim sherds remain unidentified because they lack sufficient diagnostic portions of the vessel needed for proper identification. Therefore, a complete examination of the assemblage from RG5 may reveal identifiable bottle rims. The second exception to the inter-

assemblage trend noted above is present in the RG10 assemblage. There is a greater number of flaring-rim bowls than other bowls at this location. A total of 65 flaring-rim bowls were identified in this assemblage compared to 54 other bowls, a difference of approximately 2 percent.

When Wilson (2005:177-180) compared the proportional frequencies of vessel forms at residential groups 1, 5, 7, 8, and 10, he found that the relative frequencies do vary across the locations. He does not assume, however, that this variation is related to occupational inconsistencies among the residential groups. Other researchers in the Moundville region have cited variation in vessel form frequencies from different contexts as a measure of synchronic status-related differentiation between individuals inhabiting those locales (Welch and Scarry 1995). Wilson's examination at Moundville, however, led him to conclude "that there appears to be little status-based variation between different residential areas at early Moundville." Further, he suggests that the variation documented from the Roadway Excavations is related more to diachronic changes in vessel form production and use rather than synchronic differences in status. It is argued that the same can be assumed for the residents of Mound W if its assemblage does not significantly vary from other off-mound residential locations at Moundville.

A comparison of the relative proportional frequencies of vessel forms from Mound W and residential groups 1, 5, 7, 8, and 10, reveals that some variation is present among the assemblages ($x^2 = 97.6$; $df = 15$; $p < .001$) (Table 4). However, this variation is not considered evidence that different sets of activities produced these ceramic remains. As stated above, Wilson (2005) argues the data from Moundville's Roadway Excavations do not vary enough to proffer differences in the occupational use of the

residential locations. Therefore, it is assumed that if the relative proportions of vessel forms at Mound W lie within the expected ranges demarcated by the other off-mound residential locations, then it can be argued that Mound W was a residential location at early Moundville where a similar range of activities occurred.

By referring to Table 4, it can be seen that the proportions of vessels forms at Mound W lie within the expected ranges for an off-mound residential group. One exception is present. Flaring-rim bowls constitute 7.1 percent of Mound W's assemblage, which is smaller than the percentage of flaring-rim bowls from any other group. The RG8 assemblage contains the second-smallest percentage of flaring-rim bowls, having 9.5 percent. A comparison of Mound W's assemblage to the RG8 assemblage, however, shows that the relative proportions of all vessel forms at the two locations are similar ($x^2 = 7.5$; $df = 3$; $p = .058$). The same result is produced when the assemblages from Mound W and RG5 are compared ($x^2 = 2.2$; $df = 3$; $p = .526$). These findings suggest that the percentage of flaring-rim bowls at Mound W lies within the range expected for an off-mound residential group. Further, Mound W's assemblage is composed of equal proportions of vessel forms relative to residential groups 5 and 8. Also, comparisons of data show that Mound W's assemblage mirrors those from other off-mound residential groups at Moundville. Therefore, it is assumed that Mound W was not an anomaly or special-purpose deposit. All evidence from Mound W suggests that it was a domestic, residential location at early Moundville.

Oversized Jars at Moundville

The discussion above has shown that Mound W's ceramic assemblage is similar to other off-mound residential assemblages at Moundville. A comparison of oversized jars can illuminate the distribution of these specific vessels at the site. It is argued that the presence of oversized jars at off-mound residential locations suggests surpluses were stored there.

A total of 111 oversized jar rims were positively identified in the Mound W assemblage (Table 5). This number constitutes 6.0 percent of all classifiable vessel rims from Mound W. Wilson (2005) identified oversized jar rims in several other residential groups (Table 5). The RG1 assemblage had the highest percentage of oversized jars rims in relation to all other classified rims (3.7 percent). Only in the RG5 assemblage were no oversized jar rims identified. As noted earlier, however, there are only 63 specimens in the RG5 assemblage. The absence of oversized jar rims, like the absence of bottle rims, may be a result of the small sample size.

Chi-square tests were used to examine the relative proportion of oversized jar rims to all other classifiable rims at Mound W and other off-mound residential groups. When compared, the RG 1 assemblage is shown to have a similar proportion of oversized jars as Mound W ($x^2 = 2.7$; $df = 1$; $p = .101$). When unclassified rims are included in the count[1], the proportion of oversized jars in the RG 10 assemblage is also shown to be similar to the proportion at Mound W ($x^2 = 1.3$; $df = 1$; $p = .261$). This suggests that the inhabitants of Mound W, RG1, and RG10 stored comparable amounts of surplus foods. It is further argued here that the smaller proportions of oversized jar rims at RG5, RG7, and RG8 should not be considered evidence that inhabitants of those residential locations

Table 5. Frequency and Percentage of Oversized Jar Rims per Location at Moundville.

Vessel Form	Location											
	Mound W		Res. Group 1*		Res. Group 5*		Res. Group 7*		Res. Group 8*		Res. Group 10*	
	N	%	N	%	N	%	N	%	N	%	N	%
Oversized Jars	111	6.0	13	3.7	0	0.0	1	0.6	16	1.9	18	3.4
All other vessels	1753	94.0	334	96.3	63	100.0	176	99.4	815	98.1	510	96.6
Total	1864	100.0	347	100.0	63	100.0	177	100.0	831	100.0	528	100.0

* data from Wilson (2005)

were not in charge of surpluses. It may suggest that inhabitants of those locations stored smaller amounts of surpluses in oversized storage vessels; but several other factors may account for the differences, including the length of occupation at a location, the relative size of kin groups, or the extent of spatial recovery during excavation. In addition, the frequency of oversized jar rims at any one location is likely not representative of their relative use-life. Studies document that larger vessels, and storage vessels in particular, are broken less often than smaller cooking or serving vessels (Longacre 1985; Tani and Longacre 1999). It is assumed that greater numbers of oversized jars were in use at any one time than their relative proportional frequencies indicate (Wilson 2005:159).

This chapter has presented the results of a modal analysis conducted to collect size data from jars at Mound W. These data were then compared to a comparable data set from Hog Pen Mound. It was shown that Mound W contained a significantly greater storage capacity than Hog Pen Mound. The results of a vessel form analysis conducted on Mound W's entire ceramic assemblage were also presented. The relative proportional frequencies of vessel forms at Mound W were then compared to similar data sets from other off-mound residential locations at the site. It was shown that the composition of Mound W's ceramic assemblage is similar to other domestic, residential assemblages at Moundville. Data presented in this chapter also show that oversized jars are ubiquitous at off-mound residential locations at Moundville, suggesting that most domestic groups at the site were in control of surpluses. In the following chapter, these results will be considered in a discussion of the organization of surplus production at early Moundville.

Notes

1. A total of 600 vessel rims were not identified by form in Mound W's assemblage, composing 24.4 percent of all rims in that assemblage. It is assumed that none of these rims came from oversized jars because their uniquely diagnostic rim mode leaves them highly visible in an assemblage of sherds. Although Wilson (2005) does not state how many rims were unclassified per individual residential group assemblage he analyzed, he does report that the form of only 78 rims in his entire study assemblage was not determined (Wilson 2005:Table 7.1), which composes less than 4 percent of that count. When the 600 unclassified rims from Mound W are added into that assemblage's count, the proportion of oversized jars to all other rims drops to 4.5 percent (assuming none of the 600 represent oversized jars).

CHAPTER 5
STORAGE AND SURPLUSES AT MOUNDVILLE

In this thesis, I have presented a study that examines the distribution of large ceramic vessels, known as oversized jars, at Mound W, Moundville. Researchers speculate that oversized jars functioned as storage containers for bulk foodstuffs (C. Scarry 1995; Welch and Scarry 1995; Wilson 2005). Under this assumption, this project was conducted to compare the extent of storage via oversized jars between two archaeological locations: Mound W at Moundville, and Hog Pen Mound. Mound W is assumed to be an off-mound domestic, residential area at Moundville (Johnson 2005). Hog Pen is a single-mound site in the Black Warrior River Valley, and is argued to have served as the residential locale of sub-elite administrators in charge of overseeing the storage and shipment of surplus foods in the Moundville chiefdom (Knight and Steponaitis 1998; Welch 1998). Data collected during this project supports the conclusion that inhabitants of Mound W stored significantly greater amounts of surpluses than did the occupants of Hog Pen Mound.

I also compared Mound W's ceramic assemblage to the ceramic assemblages of several other off-mound residential groups at the Moundville site (Wilson 2005). These residential groups represent the domestic locations of distinct groups that lived at Moundville, contemporaneously with the inhabitants of Mound W. I assumed that if Mound W's assemblage was composed of similar classes of ceramic vessels, then the

types of activities that required the use of those vessels – storage, food preparation, cooking, serving, drinking – occurred as well at Mound W. Data collected during this project show that Mound W's ceramic assemblage is composed of similar proportions of all vessel classes found at other off-mound residential areas at Moundville. Further, all but one residential sample in the comparison contains oversized jars, and some contain oversized jar rims in proportions similar to that at Mound W. It is argued here that most, if not all, residential groups were in the practice of storing surplus foods.

Following these lines of evidence, the remainder of this chapter is devoted to forwarding a preliminary discussion of the significance of these new data in light of the role of surplus storage at early Moundville. Sometime during the twelfth century A.D., large groups of individuals began coalescing on the Moundville terrace where they constructed houses and earthen mounds, and defined new social roles and relationships. New surpluses were available. Agricultural production was intensified – but even more, new surpluses were defined through daily interactions and surplus labor that built the Moundville site and society.

An Overview of the Role of Surpluses in Chiefdom-Level Societies

In Chapter 2, I discussed in some detail the central position of surpluses in explanations of the development of chiefdom-level social complexity. Surpluses have figured prominently in early archaeological discussions of the advancement of civilization (Childe 1954), in neo-evolutionary and redistribution models (Fried 1967; Service 1962), in early critiques of unilinear evolution and redistribution (Earle 1977; Peebles and Kus 1977; Sahlins 1972; Steponaitis 1978), and even in more recent social

and political-economic models (Anderson 1994; Barker and Pauketat 1992; Earle 1997, 2002; Welch 1991). Beyond the chiefdom literature, surpluses are argued to play a central role in the transfiguration of social relations in most, if not all, "types" of society (Arnold 1993; Bender 1978, 1990; D'Altroy and Earle 1985; Ingold 1983; Saitta and Keene 1990; Testart 1982; Trigger 2003; Woodburn 1980).

Surpluses at Moundville

Surpluses are crucial to understanding the organization of the Moundville polity. Models have been established that argue Moundville and surrounding sites were positioned, in part, to facilitate the centralized flow of staple resources (Peebles and Kus 1977; Steponaitis 1978). Moundville's current economic model assumes that sites like Hog Pen Mound were regional nodes of surplus storage that functioned to supply elites at Moundville with surpluses used to fund labor projects and other elite activities (Knight and Steponaitis 1998; Welch 1991).

This research was designed to assess the success of Moundville's political-economic model to predict where surpluses were stored at Moundville, and further to explore the organization of surplus production at the site. It was stated that if vessel size data revealed a greater food storage capacity at Hog Pen Mound than at Mound W, then that finding could be used to support the hypothesis that Moundville's economy functioned in the manner traditionally proposed (Welch 1991). Alternatively, if no differences in storage capacity were documented between the two locations, then it cannot be assumed that elites were in charge of greater amounts of stored food than commoners, and it cannot be argued that the control of food surpluses by elites was

necessarily correlated with the development of Moundville. Third, if Mound W contained a greater capacity of food storage than Hog Pen Mound, then the hypothesis that domestic producers retained control of food surpluses at Moundville can be more strongly supported. Data presented in this thesis are taken as evidence that the inhabitants of Mound W, and possibly the inhabitants of other off-mound residential areas at Moundville, were in charge of greater amounts of surplus foods than the occupants of Hog Pen Mound.

The Organization of Surplus Production at Moundville

This conclusion implies that groups were storing surpluses in uniquely oversized storage vessels. This project cannot, however, address the assumption that surpluses were also stored in above ground granaries. Ethnohistoric documents reveal that later southeastern groups utilized granaries for the storage of foods and other items (Bartram 1958; Clayton et al. 1993; Swanton 1946). The nature of control over granaries is unclear from those earliest European documents, however, and it is possible that chiefs did not have sole access to the surpluses stored in them (Blitz 1993a:21-22; Cobb 2000:21; Muller 1997:97; Scarry and Scarry 2005). Surpluses in these sixteenth century societies do not appear to have been centrally organized in the fashion that has been described ethnohistorically for complex chiefdoms elsewhere (Earle 1977). In protohistoric southeastern societies, surpluses were stored in individual household granaries as well as plausible village-level communal granaries (Scarry and Scarry 2005:265; J. Scarry 1995, 2001:45). I assume that the flows of surpluses, and the

motivations behind producing a surplus, are not reducible to one single model or explanation.

It is possible that elevated granaries were also used at Moundville during the Mississippi period. Archaeologists assume this to be the case because large subterranean pits, interpreted as storage pits, are relatively absent in the archaeological record during the early Moundville phases (Knight and Steponaitis 1998:15; Scarry 1998:93). The best evidence for a transition in storage practices is found in an article by Mistovich (1988). At the Mill Creek site, he is able to show that large storage pits located outside of domestic structures during the West Jefferson phase gave way to small storage pits situated within domestic structures during the early Mississippian phases at that site (Mistovich 1988:32, 36). The adoption of elevated granaries would have allowed increasing surpluses to be stored within a context of high public visibility. The visual display of wealth is generally cited as a common strategy of groups or individuals in early complex societies competing for access to surplus labor (DeBoer 1988; DeMarrais et al. 1996; Earle 1997; Malinowski 1961; Trigger 1990; Ward 1985). At Moundville, excavations of residential areas at the northwest riverbank (RG 11 and RG 12 in Figure 13) did not recover subsurface pit features, although oversized jar rims were found there (C. Scarry 1995).

What is argued here is that although elevated granaries were likely used at Moundville to fulfill various community-level needs or projects, it is likely that domestic producers never lost control over their surpluses, or their labor, during the early Mississippi period at Moundville. Moreover, surplus production during the early Moundville phases was plausibly organized at the residential/domestic group levels. This

is not to say that some groups did not produce or control more surpluses than others, or that all groups shared equal access to surplus labor. What is more intriguing is that all groups were likely storing surpluses. At Moundville, oversized jars have not only been recovered in presumed commoner residential locations, but have also been recovered in supposed elite contexts (C. Scarry 1995:52; Welch and Scarry 1995:416; Wilson 2005:158). The fact that elites may have used the same ceramic storage technology as non-elites may imply that occupants of elite areas at Moundville were not relieved from agricultural labor, and were not exempt from producing a surplus for the provisioning of public stores. Viewed this way, archaeological signatures of food provisioning documented at arguably elite areas at the site may be seen as residues of special events in high-status areas instead of tribute extracted by elites, as Welch (2001:226-227; see also Blitz 1993a:183-184) has recently pointed out. It is an important distinction to make. The politics behind organizing a meaningful surplus (*sensu* Sahlins 1972) may have been more complex at Moundville than a strict elite-commoner dichotomy may suggest. Investigating the coalescence and building of the Moundville site and to understand Moundville's political economy is to examine the sources of surpluses and surplus labor (Cobb 1993), and to consider the motivations groups had for producing a surplus in the first place.

The Organization of Surplus Production at Moundville: A Decentralized View

While discussing the nature of off-mound residential groups at Moundville, Wilson (2005) suggested that these locales were spaces where people lived and engaged in a plethora of domestic and extra-domestic activities. Architectural remains at these

groups showed that people not only built houses of various sizes, but also constructed large public buildings that served as gathering places for ritual and ceremonial events. Ceramic remains and other artifact classes traditionally viewed as elite prestige items are widely distributed in all residential groups, suggesting that ceremonial life was an integral aspect at all levels of Moundville's society (see also Johnson 2005; C. Scarry 1995). Even after these locations ceased to serve as domestic residences, descendants of the former inhabitants of off-mound residential groups, including Mound W, converted these spaces into discrete group cemeteries. Apparently, kinship was still a major organizing feature of social life during the later Moundville phases. As Wilson explains, all evidence:

> suggests that households were not casually dispersed across the Moundville terrace but were already staking claims to specific portions of the landscape [by the early Moundville I subphase]. By settling into certain areas of the Moundville terrace and carrying out the everyday tasks of building houses and planting small fields and gardens, these households were initiating a process of routinized domestic behaviors that served to define relationships among different kin groups and the physical landscape. This process ultimately culminated in the construction of the Moundville sociogram during the late Moundville I phase [Wilson 2005:198].

In the opening of this thesis, I presented an outline of some models used to explain the development of chiefdoms in general, and Moundville specifically. What I

hoped to show is that most models of chiefdom development have relied upon explanations that effectively separated the political and domestic realms. Those models implicitly rely upon notions that surplus production is spurred by forces originating outside of the household, and indeed, beyond the aspirations of the majority of domestic/agricultural producers. These lines of thought often consider the mere consumption of surpluses during prehistoric events that produced the material patterns/archaeological correlates of complex society, like monumental mound architecture or exotic goods, as post hoc evidence for elite-controlled, centralized organization of surplus production. Indeed, at Moundville, even the construction of modest earthworks in the earliest stages of the Mississippi period prior to the layout of Moundville's plaza has been interpreted as evidence of elite leadership because those earthworks required surplus labor (Knight and Steponaitis 1998:13; Steponaitis 1992). Recently, however, some Mississippian researchers have begun to question this view (Brown 2006; Muller 1997). Could surpluses used to mobilize labor throughout much of Moundville's history have been applied directly by those considered non-elite? It is argued here that recent evidence from Moundville should be utilized as a starting point for a closer examination of the processes and relationships that structured the production and flow of surpluses and labor that helped structure the Moundville chiefdom.

A place to begin might be to consider why spatially segregated, yet socially integrated, groups of individuals coalesced at Moundville at a time of economic intensification that produced new surpluses used to shape Moundville's society. Dispersed social groups at early Moundville did participate in ceremonial and ritual affairs, and it was those individuals who played a role in defining and constituting a

surplus (Spielmann 2002; Wells 2006). It is likely that certain individuals from all residential groups had ceremonial roles both within and outside the household, and it is also likely that small-scale feasting and politics took place at the household level (Bowser 2000). If so, surpluses stored in large oversized jars would have been a visible testament to each groups' ability to provision a *public economy*. Ultimately, it may be difficult to draw a strict line demarcating Moundville's subsistence economy from its political economy (Hendon 1996).

It is assumed that most people who lived at Moundville had reasons to produce a surplus. It is important that we continue to consider the social aspects of how those surpluses were used. I believe that opening dialogues unhindered by elite-commoner dichotomies may not only serve to illuminate the organization of surplus production, but may also help us to better visualize what it meant to be a Mississippian elite at Moundville.

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APPENDIX

Case ID	Box No.	Bag No.	Accession No.	Form (J = jar, OJ = oversized jar)	Type (MP = Mississippi Plain, MI = Moundville Incised	Variety	Lip Form (fo = folded, fl = flattened)	Vessel Thickness (mm)	Sherd Height (mm)	Sherd Width (mm)	Mass (g)	Handle Top (mm)	Handle Bottom (mm)	Diameter (cm)	Arc (%)
1	19	9059-9422	M-Wp 9123	J	MP	Warrior	fo, fl	8	66	69	56.5			34	1-5
2	19	9059-9422	M-Wp 9126	J	MP	Warrior		6	31	48	13.1			27	6-10
3	19	9059-9422	M-Wp 9060	J	MP	Warrior	fl	8	54	43	27.1			35	6-10
4	19	8713-9058	M-Wp 8717	J	MP	Warrior	fl	4	35	42	11.1	12	11	31	1-5
5	19	8713-9058	M-Wp 8943	OJ	MP	Warrior	fo, fl	7	58	61	53.7			70	1-5
6	19	8713-9058	M-Wp 8914	OJ	MP	Warrior	fo, fl	11	46	63	57.8			70	1-5
7	19	8713-9058	M-Wp 8915	J	MP	Warrior		6	25	43	12.8			23	1-5
8	19	8713-9058	M-Wp 8916	OJ	MP	Warrior	fo, fl	11	44	71	50.9			48	1-5
9	19	8713-9058	M-Wp 8912	J	MP	Warrior	fo, fl	8	38	66	34.4			44	1-5
10	19	8713-9058	M-Wp 8869	J	MP	Warrior	fl	8	64	88	82.5	23	23		
11	19	9059-9422	M-Wp 9303	J	MP	Warrior	fl	7	41	66	20.9			39	
12	19	9423-9533	M-Wp 9496	J	MP	Warrior		5	60	80	48.2	19	18		
13	19	9423-9533	M-Wp 9431	J	MP	Warrior		10	64	49	53.7	22	21		
14	19	9423-9533	M-Wp 9474	J	MP	Warrior	fl	8	36	63	30.6			22	6-10
15	19	9423-9533	M-Wp 9466	J	MP	Warrior	fl	5	28	41	13.8			26	1-5
16	19	8633-8712	M-Wp 8669	J	MP	Warrior	fo, fl	11	58	74	66.7				
17	19	8633-8712	M-Wp 8662	J	MP	Warrior	fl	9	40	58	22.6			38	1-5
18	19	8633-8712	M-Wp 8671	J	MP	Warrior	fo, fl	9	59	71	61.1			40	6-10
19	19	8633-8712	M-Wp 8711	J	MP	Warrior	fo, fl	8	54	83	37.1			44	6-10
20	19	9059-9422	M-Wp 9203	J	MP	Warrior	fo, fl	8	46	59	36.7			40	1-5
21	19	9059-9422	M-Wp 9219	OJ	MP	Warrior	fo, fl	10	48	100	83.8			54	6-10
22	19	9059-9422	M-Wp 9273	J	MP	Warrior	fo, fl	6	26	45	17.1				
23	20	9574-9594	M-Wp 9580	J	MP	Warrior	fl	5	20	61	10.2			17	11-15
24	20	9538-9569	M-Wp 9562	OJ	MP	Warrior	fo, fl	8	48	61	33.4			57	
25	20	10226-10298	M-Wp 10250	OJ	MP	Warrior	fo, fl	7	47	81	59.8			52	1-5
26	20	9927-9956	M-Wp 9947	J	MP	Warrior	fo	10	67	124	116			33	11-15
27	20	9741-9926	M-Wp 9854	J	MP	Warrior		8	53	69	40.9			31	6-10
28	20	9741-9926	M-Wp 9872	OJ	MP	Warrior	fo, fl	11	60	172	159			77	6-10
29	20	9741-9926	M-Wp 9883	J	MP	Warrior	fo, fl	5	27	87	15.2			27	6-10
30	20	9741-9926	M-Wp 9894	J	MP	Warrior		7	45	45	21.5	17	15		
31	20	9741-9926	M-Wp 9829	J	MP	Warrior	fl	5	73	58	48.6	16	16		
32	20	9957-10225	M-Wp 10110	J	MP	Warrior	fo	4	58	93	58.8			31	6-10
33	20	9957-10225	M-Wp 10198	J	MP	Warrior	fo	8	59	75	69			33	6-10
34	20	9957-10225	M-Wp 10127	J	MP	Warrior	fo	6	38	61	26.7			21	6-10
35	20	9957-10225	M-Wp 10123	J	MP	Warrior	fo, fl	6	39	93	58.4			25	11-16
36	20	9595-9740	M-Wp 9736	OJ	MP	Warrior	fo, fl	9	66	67	62.8			73	1-5
37	20	9595-9740	M-Wp 9674	OJ	MP	Warrior	fo, fl	10	50	74	48.4			55	1-5
38	20	9595-9740	M-Wp 9681	OJ	MP	Warrior	fo, fl	7	47	74	41.2			50	1-5
39	20	9595-9740	M-Wp 9650	OJ	MP	Warrior	fo, fl	11	67	109	121			49	6-10
40	20	9957-10225	M-Wp 10088	J	MP	Warrior	fo, fl	7	40	96	36.7			39	6-10
41	20	9957-10225	M-Wp 9997	J	MP	Warrior	fo, fl	10	38	64	41.1			44	1-5

Case ID	Box No.	Bag No.	Accession No.	Form (J = jar, OJ = oversized jar)	Type (MP = Mississippi Plain, MI = Moundville Incised	Variety	Lip Form (fo = folded, fl = flattened)	Vessel Thickness (mm)	Sherd Height (mm)	Sherd Width (mm)	Mass (g)	Handle Top (mm)	Handle Bottom (mm)	Diameter (cm)	Arc (%)
42	20	9957-10225	M-Wp 10202	J	MP	Warrior	fo		34	64	25.5			28	6-10
43	20	9957-10225	M-Wp 10021	J	MP	Warrior	fo, fl	9	47	67	55.4			35	6-10
44	20	9957-10225	M-Wp 10221	J	MP	Warrior	fo		26	49	11.7			22	6-10
45	20	9957-10225	M-Wp 10062	J	MP	Warrior	fo	8	53	53	35.6			19	6-10
46	20	9957-10225	M-Wp 10029	J	MI	Moundville	fo, fl	4	24	34	4.8			12	6-10
47	21	11145-11438	M-Wp 11155	J	MP	Warrior	fo, fl	5	33	60	18.7			37	1-5
48	21	11145-11438	M-Wp 11386	J	MP	Warrior	fo		60	93	61.8			49	1-5
49	21	10572-10591	M-Wp 10575	J	MP	Warrior	fo	5	64	84	41.1			21	6-10
50	21	10754-10910	M-Wp 10827	J	MP	Warrior		8	72	111	61.4			28	11-15
51	21	10754-10910	M-Wp 10820	J	MP	Warrior		6	54	94	36.5			21	16-20
52	21	10754-10910	M-Wp 10821	J	MP	Warrior	fo, fl	7	35	72	38.7			24	6-10
53	21	10754-10910	M-Wp 10823	J	MP	Warrior	fo, fl		28	73	33.7			30	6-10
54	21	10754-10910	M-Wp 10837	J	MP	Warrior	fo	7	27	49	17			35	1-5
55	21	10714-10752	M-Wp 10972	OJ	MP	Warrior	fo, fl	8	54	82	78.9			45	6-10
56	21	10714-10752	M-Wp 10723	J	MP	Warrior	fo		34	69	22.7			30	6-10
57	21	10714-10752	M-Wp 10729	J	MP	Warrior	fo	7	30	60	18.2			24	6-10
58	21	10533-10571	M-Wp 10570	J	MP	Warrior	fo	5	54	110	78.2			33	6-10
59	21	10533-10571	M-Wp 1053?	J	MP	Warrior	fo, fl	7	45	96	43.4			23	6-10
60	21	10533-10571	M-Wp 10561	J	MP	Warrior	fo, fl	5	29	50	12.5			32	1-5
61	21	10633-10712	M-Wp 10639	J	MI	Oliver	fo, fl	8	77	86	81.3			35	6-10
62	21	10633-10712	M-Wp 10633	J	MP	Warrior	fo	8	47	78	41			39	6-10
63	21	11145-11438	M-Wp 11284	J	MP	Warrior	fl		59	74	69.6	18	18		
64	21	11145-11438	M-Wp 11241	J	MP	Warrior	fo	7	42	68	42.1			40	6-10
65	21	11145-11438	M-Wp 11255	J	MP	Warrior	fo, fl	7	44	77	44			31	6-10
66	21	11145-11438	M-Wp 11207	J	MP	Warrior	fl	5	41	67	22.2			16	1-5
67	21	10422-10532	M-Wp 10529	OJ	MP	Warrior	fo, fl	11	43	65	38.4			44	1-5
68	21	10422-10532	M-Wp 10429	J	MP	Warrior	fo, fl	9	46	55	35.4			38	1-5
69	21	10422-10532	M-Wp 10527	J	MP	Warrior	fo		34	61	17.9			31	1-5
70	21	10422-10532	M-Wp 10440	J	MP	Warrior	fo	7	42	70	17			29	6-10
71	21	10422-10532	M-Wp 10493	J	MP	Warrior	fo	5	38	62	18.9			21	6-10
72	21	10422-10532	M-Wp 10521	J	MP	Warrior	fo, fl	7	74	80	67			39	6-10
73	21	10422-10532	M-Wp 10531	J	MP	Warrior	fo	8	73	131	109			21	11-15
74	21	10302-10421	M-Wp 10380	J	MI	Moundville	fo	4	31	57	10.4			22	6-10
75	21	10302-10421	M-Wp 10326	J	MP	Warrior	fl	8	69	69	46.3			30	1-5
76	22	12270-12333	M-Wp 12290	J	MP	Warrior	fo	6	32	75	34.1			33	6-10
77	22	10227-12333	M-Wp 12307	J	MP	Warrior	fo	6	49	84	38.3			17	11-15
78	22	12334-12598	M-Wp 12412	J	MP	Warrior	fo		31	71	32.2			26	11-15
79	22	12334-12598	M-Wp 12478	J	MP	Warrior	fo		33	68	16.5			22	6-10
80	22	12334-12598	M-Wp 12444	J	MP	Warrior	fo	9	85	83	101	20	15		
81	22	11677-12107	M-Wp 11696	J	MP	Warrior	fo, fl	8	92	150	164	31	26	25	16-20
82	22	11677-12107	M-Wp 12104	J	MP	Warrior	fl	7	47	48	21.4	13	13		

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83	22	11566-11675	M-Wp 11616	OJ	MP	Warrior	fo, fl	9	41	60	27.2			62	1-5
84	22	11566-11675	M-Wp 11619	J	MP	Warrior	fo, fl	7	28	61	29.1			30	6-10
85	22	11566-11675	M-Wp 11623	J	MP	Warrior	fo, fl		40	68	39.6			42	6-10
86	22	12108-12193	M-Wp 12109	J	MP	Warrior	fo, fl	11	60	109	67.6			34	6-10
87	22	12108-12193	M-Wp 12123	OJ	MP	Warrior	fo, fl	8	55	74	49.7			62	1-5
88	22	12108-12193	M-Wp 12130	J	MP	Warrior	fo		26	63	11.2			30	6-10
89	22	12108-12193	M-Wp 12127	OJ	MP	Warrior	fo, fl	10	37	65	38.5			54	1-5
90	22	12108-12193	M-Wp 12150	J	MP	Warrior	fo, fl	5	27	41	6.8			19	6-10
91	22	11677-12107	M-Wp 12067	J	MI	Oliver	fo	6	44	56	24.2			28	1-5
92	22	11677-12107	M-Wp 12064	J	MP	Warrior	fo, fl	6	39	77	31.3			27	6-10
93	22	11677-12107	M-Wp 12081	J	MP	Warrior	fo, fl	7	32	72	23.2			29	6-10
94	22	11677-12107	M-Wp 12004	J	MP	Warrior	fo, fl	5	43	82	28			21	11-15
95	22	11677-12107	M-Wp 12041	J	MP	Warrior	fo	8	43	82	43.9			29	6-10
96	22	11677-12107	M-Wp 12016	J	MP	Warrior	fo	9	57	81	71.2			37	6-10
97	22	11677-12107	M-Wp 12001	J	MP	Warrior	fo, fl	5	44	120	46.7			38	11-15
98	22	12334-12598	M-Wp 12588	OJ	MP	Warrior	fo, fl	10	38	55	36.2			50	1-5
99	22	12334-12598	M-Wp 12536	J	MP	Warrior	fo, fl	7	27	50	19.9			27	6-10
100	22	12334-12598	M-Wp 12567	J	MP	Warrior	fo		36	48	17.6			24	6-10
101	22	12334-12598	M-Wp 12509	J	MP	Warrior	fo	5	32	38	15.2			36	1-5
102	22	12334-12598	M-Wp 12554	J	MP	Warrior	fl	5	42	44	23	14	13		
103	22	12334-12598	M-Wp 12562	J	MI	unspecified	fl	5	77	50	51	23	19		
104	23	12780-12793	M-Wp 12784	J	MP	Warrior	fo	7	37	69	31.1			47	1-5
105	23	12908-13084	M-Wp 12975	OJ	MP	Warrior	fo, fl	8	47	70	47			67	1-5
106	23	12908-13084	M-Wp 13074	J	MP	Warrior	fo	8	32	95	46.5			23	11-15
107	23	12908-13084	M-Wp 13030	OJ	MP	Warrior	fo, fl	9	42	74	66.5			62	1-5
108	23	13229-13313	M-Wp 13241	J	MP	Warrior	fl	7	61	77	61.7	22	19		
109	23	13229-13313	M-Wp 13262	J	MP	Warrior	fo	7	80	60	48.7			17	16-20
110	23	13229-13313	M-Wp 13269	J	MP	Warrior	fo	8	58	68	49.9			26	6-10
111	23	13229-13313	M-Wp 13316	OJ	MP	Warrior	fo, fl	13	63	82	103			51	1-5
112	23	13229-13313	M-Wp 13255	J	MP	Warrior	fo	7	45	68	33.5			41	6-10
113	23	13229-13313	M-Wp 13285	J	MP	Warrior	fo, fl	11	50	56	44.9			48	1-5
114	23	12908-13084	M-Wp 12923	J	MP	Warrior	fo, fl	7	51	81	53.6			37	6-10
115	23	12908-13084	M-Wp 13081	OJ	MP	Warrior	fo, fl	8	55	96	84.1			58	1-5
116	23	12908-13084	M-Wp 13076	J	MP	Warrior	fo, fl	9	92	155	200			45	6-10
117	23	13180-13228	M-Wp 13223	J	MP	Warrior	fo	8	30	71	20			22	11-15
118	23	13180-13228	M-Wp 13217	OJ	MP	Warrior	fo, fl	12	39	48	36.8			51	1-5
119	23	12654-12754	M-Wp 12723	J	MP	Warrior	fo	5	35	38	13.8			16	6-10
120	23	12654-12754	M-Wp 12703	J	MP	Warrior	fo	5	56	79	35.9			29	6-10
121	23	13086-13179	M-Wp 13143	J	MP	Warrior	fo		24	53	12			23	6-10
122	23	13086-13179	M-Wp 13169	J	MP	Warrior	fo, fl		31	53	21.1			21	6-10
123	23	13086-13179	M-Wp 13178	J	MP	Warrior	fo, fl	8	63	84	95	22	22		

Case ID	Box No.	Bag No.	Accession No.	Form (J = jar, OJ = oversized jar)	Type (MP = Mississippi Plain, MI = Moundville Incised	Variety	Lip Form (fo = folded, fl = flattened)	Vessel Thickness (mm)	Sherd Height (mm)	Sherd Width (mm)	Mass (g)	Handle Top (mm)	Handle Bottom (mm)	Diameter (cm)	Arc (%)
124	23	13086-13179	M-Wp 13122	J	MP	Warrior	fo	5	54	69	34.9	9	7		
125	23	13089-13179	M-Wp 13168	J	MP	Warrior	fo, fl	4	61	76	30.7	14	11	12	
126	23	13344-13614	M-Wp 13359	J	MP	Warrior	fo, fl	4	23	48	9			22	6-10
127	23	13344-13614	M-Wp 13508	J	MP	Warrior	fo, fl	9	38	54	25			28	6-10
128	23	13344-13614	M-Wp 13446	J	MP	Warrior	fo	6	56	115	80.8			37	6-10
129	23	13344-13614	M-Wp 13480	J	MP	Warrior	fl	5	56	30	18.5	16	15		
130	23	12850-12906	M-Wp 12879	J	MP	Warrior	fo, fl	5	50	71	19.3			26	6-10
131	23	12850-12906	M-Wp 12860	J	MP	Warrior	fo, fl	11	53	110	94.9			39	6-10
132	23	12850-12906	M-Wp 12902	J	MP	Warrior	fo, fl	11	50	118	69.9			43	1-5
133	24	13344-13614	M-Wp 13581	J	MP	Warrior	fo	6	64	97	100	20	17	26	11-15
134	24	13344-13614	M-Wp 13577	J	MP	Warrior	fl	4	40	37	16.4	15	13		
135	24	13664-13803	M-Wp 13666	OJ	MP	Warrior	fo, fl	10	54	57	50.2			41	1-5
136	24	13664-13803	M-Wp 13669	OJ	MP	Warrior	fo, fl	7	60	97	79.3			73	1-5
137	24	13664-13803	M-Wp 13675	OJ	MP	Warrior	fo, fl	8	34	71	37.7			45	6-10
138	24	13664-13803	M-Wp 13782	J	MP	Warrior	fo, fl	9	39	92	74.8			37	6-10
139	24	13664-13803	M-Wp 13664	OJ	MP	Warrior	fo, fl	9	57	95	78.6			54	6-10
140	24	13664-13803	M-Wp 18974	J	MP	Warrior	fo, fl	9	73	165	118			35	6-10
141	24	13804-13969	M-Wp 13859	J	MP	Warrior	fo	7	33	53	18.4			32	1-5
142	24	13804-13969	M-Wp 13829	OJ	MP	Warrior	fo, fl	10	40	44	33.5			62	1-5
143	24	13804-13969	M-Wp 13826	OJ	MP	Warrior	fo, fl	10	40	101	57.1			41	6-10
144	24	13804-13969	M-Wp 13818	OJ	MP	Warrior	fo, fl	8	104	190	274			62	6-10
145	24	13972-14025	M-Wp 13984	J	MP	Warrior	fo, fl	7	40	58	24.5			31	6-10
146	24	13972-14025	M-Wp 13972	J	MP	Warrior	fo, fl	12	116	116	190			35	1-5
147	24	13804-13969	M-Wp 13825	OJ	MP	Warrior	fo, fl	10	45	65	59.6			58	1-5
148	24	13804-13969	M-Wp 13939	J	MI	Carrollton	fo, fl	5	30	59	13.1			30	6-10
149	24	13804-13969	M-Wp 13913	J	MI	Warrior	fo, fl	10	44	64	53.6			77	1-5
150	24	14026-14100	M-Wp 14026	J	MI	Warrior	fo, fl	11	107	110	183			39	6-10
151	25	14101-14139	M-Wp 14118	J	MP	Warrior	fo, fl		29	73	20.2			27	6-10
152	25	14101-14139	M-Wp 14111	OJ	MP	Warrior	fo, fl	10	64	101	115			44	6-10
153	25	14140-14886	M-Wp 14681	J	MP	Warrior	fo, fl		34	58	29.7			22	6-10
154	25	14140-14886	M-Wp 14667	OJ	MP	Warrior	fo, fl		66	88	157			75	1-5
155	25	14140-14886	M-Wp 14662	OJ	MP	Warrior	fo, fl	13	77	95	199			57	1-5
156	25	14140-14886	M-Wp 14677	OJ	MP	Warrior	fo, fl		28	69	22.4			128	1-5
157	25	14140-14886	M-Wp 14678	OJ	MP	Warrior	fo, fl		42	55	61.3			53	1-5
158	25	14140-14886	M-Wp 14650	J	MP	Warrior	fo	5	48	222	142			25	21-25
159	25	14140-14886	M-Wp 14651	J	MP	Warrior	fl	7	160	197	403			31	21-25
160	25	14140-14886	M-Wp 14178	J	MP	Warrior	fo, fl	11	53	78	69.5			32	6-10
161	25	14140-14886	M-Wp 14348	OJ	MP	Warrior	fo, fl	9	41	92	39.2			70	1-5
162	25	14140-14886	M-Wp 14315	J	MP	Warrior	fo, fl		38	73	43.8			36	6-10
163	25	14140-14886	M-Wp 14307	OJ	MP	Warrior	fo, fl	9	39	84	52.1			77	1-5
164	25	14140-14886	M-Wp 14344	J	MP	Warrior	fo, fl	9	59	81	67.6			39	6-10

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165	25	14140-14886	M-Wp 14165	J	MP	Warrior	fo, fl	10	45	81	63.6			35	6-10
166	25	14140-14886	M-Wp 14159	OJ	MP	Warrior	fo, fl	9	54	66	59.7			69	1-5
167	25	14140-14886	M-Wp 14538	J	MP	Warrior	fo, fl		24	55	14.7			19	6-10
168	25	14140-14886	M-Wp 14585	J	MP	Warrior	fo, fl	6	26	55	12.5			16	11-15
169	25	14140-14886	M-Wp 14723	J	MP	Warrior	fl	6	35	76	34.6			27	6-11
170	25	14140-14886	M-Wp 14285	OJ	MP	Warrior	fo, fl	9	47	61	42.2			51	1-5
171	25	14140-14886	M-Wp 14244	OJ	MP	Warrior	fo, fl	10	90	118	103			54	6-10
172	25	14140-14886	M-Wp 14812	J	MP	Warrior	fl	5	41	45	19.4	14	10		
173	25	14140-14886	M-Wp 14834	J	MP	Warrior	fo	6	53	86	55.9			19	11-15
174	25	14140-14886	M-Wp 14813	OJ	MP	Warrior	fo, fl	8	31	52	19.6			63	1-5
175	25	14140-14886	M-Wp 14185	J	MP	Warrior	fo, fl	6	48	45	22.6			26	6-10
176	25	14140-14886	M-Wp 14845	J	MP	Warrior		5	42	83	31.6			12	11-15
177	25	14140-14886	M-Wp 14480	J	MP	Warrior	fo		26	82	24.1			22	11-15
178	25	14140-14886	M-Wp 14456	J	MP	Warrior	fo, fl	6	42	105	41.2			25	11-15
179	25	14140-14886	M-Wp 14469	J	MP	Warrior	fo	5	90	95	90.9			21	11-15
180	25	14140-14886	M-Wp 14443	OJ	MP	Warrior	fo, fl	13	64	169	301			183	1-5
181	26	14948-15663	M-Wp 15145	J	MP	Warrior	fo, fl	7	34	51	26.3			25	6-10
182	26	14948-15663	M-Wp 15108	J	MP	Warrior	fo, fl	8	40	80	51.3			32	6-10
183	26	14948-15663	M-Wp 15174	OJ	MP	Warrior	fo, fl	8	59	84	82.1			77	1-5
184	26	14948-15663	M-Wp 15103	J	MP	Warrior	fo, fl	6	42	35	15.7	13	12		
185	26	14948-15663	M-Wp 150??	J	MP	Warrior	fl	7	80	129	97.2			24	11-15
186	26	14948-15663	M-Wp 15022	J	MP	Warrior	fo	5	41	115	44.4			17	21-25
187	26	14948-15663	M-Wp 15672	J	MP	Warrior	fo, fl		37	86	38.8			32	6-10
188	27	14948-15663	M-Wp 15282	J	MP	Warrior	fo, fl	7	55	58	48.2			25	6-10
189	27	14948-15663	M-Wp 15213	OJ	MP	Warrior	fo, fl	9	57	80	70.1			64	1-5
190	27	14948-15663	M-Wp 15370	J	MP	Warrior	fo	5	101	111	91			23	6-11
191	27	14948-15663	M-Wp 15211	J	MP	Warrior	fo, fl	9	62	97	75.2			41	6-10
192	27	14948-15663	M-Wp 15208	J	MP	Warrior	fo, fl	10	92	104	111			23	11-15
193	27	15664-15705	M-Wp 15664	J	MP	Warrior	fo, fl	9	47	128	111			63	6-10
194	27	14948-15663	M-Wp 15436	J	MP	Warrior	fo	6	25	47	14.4			21	6-10
195	27	14948-15663	M-Wp 15475	OJ	MP	Warrior	fo, fl		37	73	43.9			45	1-5
196	27	14948-15663	M-Wp 15406	OJ	MP	Warrior	fo, fl	8	54	105	81.2			50	6-10
197	27	15756-15810	M-Wp 15801	J	MP	Warrior	fo		26	62	14.4			31	6-10
198	27	15756-15810	M-Wp 15758	J	MP	Warrior	fo, fl	10	48	72	36.2			39	6-10
199	27	15830-15918	M-Wp 15890	J	MP	Warrior	fo	10	47	62	40.9			50	1-5
200	27	15830-15918	M-Wp 15871	J	MP	Warrior	fo	9	64	75	52.3			47	6-10
201	27	15830-15918	M-Wp 15835	J	MP	Warrior	fo, fl	8	40	55	25.2			31	6-10
202	27	14948-15663	M-Wp 15369	J	MP	Warrior	fl	6	67	99	67.9			27	11-15
203	27	14948-15663	M-Wp 15311	J	MP	Warrior	fl	6	56	81	49.6			22	11-15
204	27	14948-15663	M-Wp 15378	J	MP	Warrior		6	74	92	72.8			33	6-10
205	27	14948-15663	M-Wp 15385	J	MP	Warrior	fo		34	110	63.1			30	11-15

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206	27	14948-15663	M-Wp 15386	J	MP	Warrior	fo, fl		39	71	35.4			37	6-10
207	27	14948-15663	M-Wp 15314	OJ	MP	Warrior	fo, fl	12	56	84	84.1			64	1-5
208	27	14948-15663	M-Wp 15566	J	MP	Warrior		6	54	80	56.9			14	16-20
209	27	14948-15663	M-Wp 15568	J	MP	Warrior	fo, fl		37	55	40.9			39	1-5
210	27	14948-15663	M-Wp 15502	OJ	MP	Warrior	fo, fl		47	92	70.3			83	1-5
211	27	14948-15663	M-Wp 15522	J	MP	Warrior	fo, fl	12	37	58	49.8			38	1-5
212	27	14948-15663	M-Wp 15507	J	MP	Warrior	fo, fl	12	45	60	45.9			25	6-10
213	27	14948-15663	M-Wp 15577	OJ	MP	Warrior	fo, fl	6	44	62	40.8			59	1-5
214	27	14948-15663	M-Wp 15513	OJ	MP	Warrior	fo, fl	8	55	111	106			64	6-10
215	27	15741-15755	M-Wp 15743	J	MP	Warrior	fo, fl	9	42	50	27.3			20	6-10
216	28	16212-16260	M-Wp 16259	J	MP	Warrior	fo	6	80	130	86.8	40	23	21	6-10
217	28	16212-16260	M-Wp 16224	J	MP	Warrior	fo, fl	7	52	61	35.3			30	1-5
218	28	16212-16260	M-Wp 16247	J	MP	Warrior	fo, fl	5	32	75	20.3			38	1-5
219	28	16212-16260	M-Wp 16219	J	MP	Warrior	fo, fl	8	42	62	21.9			34	1-5
220	28	16366-16452	M-Wp 16375	J	MP	Warrior	fl	6	68	73	31.9	17	9		
221	28	16366-16452	M-Wp 16384	J	MP	Warrior	fo, fl	11	61	64	46.9			47	1-5
222	28	16366-16452	M-Wp 16364	J	MP	Warrior	fo		45	74	17.8			31	6-10
223	28	16366-16452	M-Wp 16377	OJ	MP	Warrior	fo, fl	10	61	73	87.8			45	1-5
224	28	15919-16119	M-Wp 15959	J	MP	Warrior	fo	9	36	58	28.8			20	6-10
225	28	15919-16119	M-Wp161207	J	MP	Warrior	fo, fl	9	44	76	41.9			35	6-10
226	28	15919-16119	M-Wp 15919	J	MP	Warrior	fo	9	75	131	188	38	24	38	11-15
227	28	16139-16201	M-Wp 16141	OJ	MP	Warrior	fo, fl	9	87	89	93			73	1-5
228	28	16313-16364	M-Wp 16319	J	MP	Warrior	fo	7	37	58	21.8			24	6-10
229	28	16261-16310	M-Wp 16287	OJ	MP	Warrior	fo, fl		34	75	41.1			42	1-5
230	28	16261-16310	M-Wp 16283	J	MP	Warrior	fo, fl	6	35	100	32.2			23	11-15
231	28	16261-16310	M-Wp 16271	OJ	MP	Warrior	fo, fl	8	53	89	79.6			50	6-10
232	28	15919-16119	M-Wp 16059	J	MP	Warrior	fo	6	26	60	13.6			25	6-10
233	28	15919-16119	M-Wp 16090	J	MP	Warrior	fo, fl	7	40	62	27.7			34	6-10
234	28	15919-16119	M-Wp 16013	OJ	MP	Warrior	fo, fl	7	42	66	35.2			44	6-10
235	28	15919-16119	M-Wp 16078	OJ	MP	Warrior	fo, fl	9	53	68	57.4			43	6-10
236	28	15919-16119	M-Wp 16079	OJ	MP	Warrior	fo, fl	10	45	88	71.8			47	6-10
237	28	15919-16119	M-Wp 16073	OJ	MP	Warrior	fo, fl	9	59	110	117			98	1-5
238	28	15919-16119	M-Wp 16016	OJ	MP	Warrior	fo, fl	8	75	165	152			92	1-5
239	29	16454-16877	M-Wp 16585	J	MP	Warrior	fo, fl	5	33	57	17.8			25	6-10
240	29	16454-16877	M-Wp 16518	OJ	MP	Warrior	fo, fl	11	53	111	111			60	6-10
241	29	16454-16877	M-Wp 16532	OJ	MP	Warrior	fo, fl	9	77	103	152			54	6-10
242	29	16454-16877	M-Wp 16858	J	MI	Oliver	fo	7	49	70	28.3			44	1-5
243	29	16454-16877	M-Wp 16864	J	MP	Warrior	fo	8	43	29	15.8	10	10		
244	29	16454-16877	M-Wp 16660	J	MP	Warrior	fo, fl	9	58	81	72.1				
245	29	16454-16877	M-Wp 16693	J	MP	Warrior	fo	5	35	76	36.3			31	6-10
246	29	16454-16877	M-Wp 16689	J	MP	Warrior	fo, fl	4	24	47	17.1			31	1-5

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247	29	16454-16877	M-Wp 16665	J	MP	Warrior	fo, fl	7	42	100	83.5			15	21-25
248	29	16454-16877	M-Wp 16653	J	MP	Warrior	fo	6	88	100	78	41	25	45	6-10
249	29	16454-16877	M-Wp 16766	OJ	MP	Warrior	fo, fl	9	66	94	77.4			102	1-5
250	29	16454-16877	M-Wp 16703	J	MP	Warrior	fo, fl		28	45	9.3			20	6-10
251	18	8356-8568	M-Wp 8496	OJ	MP	Warrior	fo, fl	11	70	90	146			163	1-5
252	18	8356-8568	M-Wp 8404	J	MP	Warrior	fo	8	35	67	20.5			27	6-10
253	18	8356-8568	M-Wp 8417	J	MP	Warrior	fo, fl	9	75	91	112			67	1-5
254	18	8356-8568	M-Wp 8473	J	MP	Warrior	fo, fl	6	47	120	89.3			36	11-15
255	18	8356-8568	M-Wp 8509	OJ	MP	Warrior	fo, fl	8	53	93	54.1			96	1-5
256	18	8356-8568	M-Wp 8400	J	MP	Warrior	fo, fl	8	47	97	77.3			37	6-10
257	18	8356-8568	M-Wp 8529	J	MP	Warrior	fo	9	54	73	60.6			28	6-10
258	18	8356-8568	M-Wp 8538	OJ	MP	Warrior	fo, fl	10	56	101	116			102	1-5
259	18	8095-8325	M-Wp 7277	J	MP	Warrior	fo, fl	5	53	79	32.7	20	19		
260	18	8095-8325	M-Wp 7312	J	MP	Warrior	fo, fl	9	51	75	52.5			34	6-10
261	18	8095-8325	M-Wp 7312	J	MP	Warrior	fo, fl	8	51	78	52.5			39	6-10
262	18	7943-7953	M-Wp 7952	J	MP	Warrior	fo, fl	8	35	52	21.6			23	6-10
263	18	8025-8039	M-Wp 8031	J	MP	Warrior	fl	6	66	57	35.8	18	13		
264	18	8025-8039	M-Wp 8028	OJ	MP	Warrior	fo, fl		40	175	99.4			62	6-10
265	18	7955-7995	M-Wp 7964	J	MP	Warrior	fo, fl	5	48	60	31.2	15	12	20	6-10
266	18	7887-7942	M-Wp 7916	J	MP	Warrior	fo, fl	9	100	168	172			27	6-10
267	18	7887-7942	M-Wp 7908	J	MP	Warrior	fo, fl	7	43	56	21.8			34	1-5
268	18	7887-7942	M-Wp 7911	J	MP	Warrior	fo, fl	5	49	45	19.3	13	13		
269	18	7996-8024	M-Wp 7999	J	MP	Warrior	fo, fl	9	64	81	57.7			31	6-10
270	18	8095-8325	M-Wp 8122	OJ	MP	Warrior	fo, fl	10	61	61	67.8			44	1-5
271	18	8095-8325	M-Wp 8114	J	MP	Warrior	fo, fl	5	34	47	17.2			28	1-5
272	18	8095-8325	M-Wp 8131	J	MP	Warrior	fo, fl	11	44	66	41.2			25	6-10
273	17	7457-7530	M-Wp 7496	OJ	MP	Warrior	fo, fl	10	35	82	36.7			42	6-10
274	17	7015-7191	M-Wp 7187	J	MP	Warrior	fo	7	36	60	24.8			32	6-10
275	17	7015-7191	M-Wp 7089	OJ	MP	Warrior	fo, fl	7	46	63	38.3			40	1-5
276	17	7015-7191	M-Wp 7167	OJ	MP	Warrior	fo, fl	10	43	80	55.6			47	1-5
277	17	7015-7191	M-Wp 7126	OJ	MP	Warrior	fo, fl	13	72	128	146			59	6-10
278	17	7531-7586	M-Wp 7548	J	MP	Warrior	fo, fl	6	40	55	20.3	10	9	15	11-15
279	17	7531-7586	M-Wp 7531	J	MP	Warrior	fo, fl	5	33	115	32.1			28	11-15
280	17	7380-7455	M-Wp 7395	J	MP	Warrior	fo	10	58	75	50.5			46	1-5
281	17	7380-7455	M-Wp 7380	J	MP	Warrior	fo, fl	6	91	96	78.7	17	14		
282	17	7380-7455	M-Wp 7441	OJ	MP	Warrior	fo, fl	7	86	110	184			161	1-5
283	17	7678-7715	M-Wp 7832	J	MP	Warrior	fo	5	56	67	48.8			28	6-10
284	17	7678-7715	M-Wp 7760	J	MP	Warrior	fo, fl	5	38	53	11.5			20	6-10
285	17	7355-7379	M-Wp 7359	J	MP	Warrior	fo, fl	5	52	60	32.3	20	15		
286	17	7015-7191	M-Wp 7141	J	MP	Warrior	fo, fl	5	39	46	8.8			15	6-10
287	17	7015-7191	M-Wp 7081	OJ	MP	Warrior	fo, fl	10	46	80	41.9			54	1-5

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288	17	7015-7191	M-Wp 7140	J	MP	Warrior	fo	5	51	87	30.4			21	11-15
289	16	6885-6889	M-Wp 6887	J	MP	Warrior	fo, fl	5	37	50	14			38	1-5
290	16	6642-6682	M-Wp 664?	J	MP	Warrior	fo	5	71	58	26.7	14	10		
291	16	6642-6682	M-Wp 6677	J	MP	Warrior	fo, fl	7	35	49	15.7			31	1-5
292	16	6642-6682	M-Wp 6672	OJ	MP	Warrior	fo, fl		35	82	46.8			90	1-5
293	16	6642-6682	M-Wp 6666	OJ	MP	Warrior	fo, fl	9	46	135	103			110	
294	16	6804-6882	M-Wp 6853	J	MP	Warrior	fo, fl	6	35	64	17.2			22	6-10
295	16	6804-6882	M-Wp 6880	J	MP	Warrior	fo	4	24	50	9.7			37	1-5
296	16	6804-6882	M-Wp 6842	OJ	MP	Warrior	fo, fl	10	45	58	42.7			107	1-5
297	16	6332-6273	M-Wp 6407	OJ	MP	Warrior	fo, fl	8	44	39	27.4			61	1-5
298	16	6332-6273	M-Wp 6433	J	MP	Warrior	fo, fl	10	37	58	39			36	1-5
299	16	6332-6473	M-Wp 6458	J	MP	Warrior	fo, fl	10	50	95	87.8	37	29		
300	16	6475-6641	M-Wp 6571	OJ	MP	Warrior	fo, fl	11	72	71	79.7			86	1-5
301	16	6475-6641	M-Wp 6548	J	MP	Warrior	fo, fl	6	29	61	17.2			32	6-10
302	15	6157-6230	M-Wp 6168	J	MP	Warrior	fo	8	43	59	38.6			25	6-10
303	15	6157-6230	M-Wp 6206	J	MP	Warrior	fo	7	27	70	27.2			41	6-10
304	15	6157-6230	M-Wp 6171	J	MP	Warrior	fo	7	85	89	65.7			26	6-10
305	15	5883-5931	M-Wp 5911	J	MI	Carrollton	fo, fl	7	38	60	34.5			28	6-10
306	15	5933-6031	M-Wp 5977	J	MP	Warrior	fo, fl	8	43	89	48.7			36	6-10
307	15	6231-6268	M-Wp 6263	J	MP	Warrior	fo, fl	7	51	41	20.5			31	6-10
308	15	6231-6268	M-Wp 6239	OJ	MP	Warrior	fo, fl		29	54	31.6			72	1-5
309	15	6231-6268	M-Wp 6254	OJ	MP	Warrior	fo, fl		35	66	46.3			146	1-5
310	15	6231-6268	M-Wp 6247	J	MP	Warrior	fo, fl	6	69	87	55.4			44	6-10
311	15	6231-6268	M-Wp 6231	OJ	MP	Warrior	fo, fl	12	88	128	156			83	1-5
312	15	6276-6331	M-Wp 6298	OJ	MP	Warrior	fo, fl	11	69	75	99.6			60	1-5
313	15	6032-6101	M-Wp 6058	OJ	MP	Warrior	fo, fl	12	40	81	54.8			70	1-5
314	14	5656-5713	M-Wp 5656	J	MP	Warrior	fo, fl	6	70	92	76.1			21	11-15
315	14	5183-5401	M-Wp 5205	J	MP	Warrior	fo, fl	6	35	58	27			34	1-5
316	14	5183-5401	M-Wp 5218	J	MP	Warrior	fo, fl	5	24	52	11.9			23	6-10
317	14	5183-5401	M-Wp 5273	J	MP	Warrior	fo, fl	6	38	69	31.6			20	6-10
318	14	5183-5401	M-Wp 5347	OJ	MP	Warrior	fo, fl	11	67	100	116			89	1-5
319	14	5532-5654	M-Wp 5534	OJ	MP	Warrior	fo, fl	10	56	121	91.3			56	6-10
320	14	5405-5480	M-Wp 5443	J	MP	Warrior	fo	8	39	87	34.6			17	6-10
321	14	5405-5480	M-Wp 5480	J	MP	Warrior	fo, fl	8	75	90	119			45	6-10
322	14	5147-5182	M-Wp 5172	J	MP	Warrior	fo, fl	5	58	63	30.8			15	16-20
323	14	5714-5683	M-Wp 5752	J	MP	Warrior	fo, fl	6	20	52	11.4			35	6-10
324	14	5039-5142	M-Wp 5128	J	MP	Warrior	fo, fl	8	50	97	52.5			38	6-10
325	13	4272-4498	M-Wp 4273	J	MP	Warrior	fo	9	52	65	34.4			38	1-5
326	13	4272-4498	M-Wp 4396	J	MP	Warrior	fo, fl	10	55	90	61.9			41	1-5
327	13	4272-4498	M-Wp 4459	J	MP	Warrior	fo, fl	4	33	86	30.2			22	11-15
328	13	4555-4826	M-Wp 4635	OJ	MP	Warrior	fo, fl	6	88	169	156			65	6-10

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329	13	4830-4962	M-Wp 4847	J	MP	Warrior	fo, fl	5	21	49	10.9			25	6-10
330	13	4830-4962	M-Wp 4917	J	MP	Warrior	fo, fl	10	42	53	23.2			39	1-5
331	12	3974-4016	M-Wp 3976	J	MP	Warrior	fo, fl	5	42	64	24.9			37	1-5
332	12	4121-4165	M-Wp 4123	J	MP	Warrior	fo, fl	6	40	41	17.2			11	6-10
333	12	4022-4120	M-Wp 4036	J	MP	Warrior	fo	5	25	70	19.2			26	6-10
334	12	3540-3972	M-Wp 3848	J	MP	Warrior	fo	9	106	113	140	26	25		
335	12	3540-3972	M-Wp 3834	OJ	MP	Warrior	fo, fl	11	60	72	82.9			110	1-5
336	12	3540-3972	M-Wp 3861	OJ	MP	Warrior	fo, fl	14	62	122	189			123	1-5
337	12	3540-3972	M-Wp 3846	OJ	MP	Warrior	fo, fl	11	37	111	106			123	1-5
338	12	3540-3972	M-Wp 3845	OJ	MP	Warrior	fo, fl	10	73	174	183			67	6-10
339	12	4214-4231	M-Wp 4229	J	MP	Warrior	fo, fl	7	31	61	32.8			30	6-10
340	12	3540-3972	M-Wp 3958	J	MP	Warrior	fo, fl		34	64	21.9			12	16-20
341	12	3540-3972	M-Wp 3923	J	MP	Warrior	fo, fl	7	52	75	36.4			45	1-5
342	12	3540-3972	M-Wp 3925	J	MP	Warrior	fo, fl	10	38	49	26.4			44	1-5
343	12	3540-3972	M-Wp 3901	J	MP	Warrior	fo	6	44	51	19.5			15	11-15
344	12	3540-3972	M-Wp 3549	OJ	MP	Warrior	fo, fl	9	40	101	66.1			50	6-10
345	12	3540-3972	M-Wp 3603	OJ	MP	Warrior	fo, fl	12	70	82	124			108	1-5
346	12	4232-4271	M-Wp 4237	J	MP	Warrior	fo	7	56	110	62.2			28	11-15
347	11	3623-3762	M-Wp 3707	J	MP	Warrior	fo, fl		25	59	11.4			41	1-5
348	11	3623-3762	M-Wp 3679	J	MP	Warrior	fo, fl	6	32	49	12.3			29	1-5
349	11	777-3539	M-Wp 3255	OJ	MP	Warrior	fo, fl	11	78	86	100			84	1-5
350	11	777-3539	M-Wp 3260	OJ	MP	Warrior	fo, fl	8	45	100	65.7			88	1-5
351	11	777-3539	M-Wp 3234	OJ	MP	Warrior	fo, fl	8	91	120	103			55	1-5
352	11	777-3539	M-Wp 3299	OJ	MP	Warrior	fo, fl		53	90	86.2			115	1-5
353	11	777-3539	M-Wp 3256	OJ	MP	Warrior	fo, fl	9	98	130	191			98	1-5
354	10	777-3539	M-Wp 2810	OJ	MP	Warrior	fo, fl	9	78	112	93.9			47	6-10
355	10	777-3539	M-Wp 2826	J	MP	Warrior	fo, fl	6	104	104	105			37	6-10
356	10	777-3539	M-Wp 2918	J	MP	Warrior	fo, fl	5	35	60	20.4			33	6-10
357	10	777-3539	M-Wp 1792	J	MP	Warrior	fo, fl	25	68	46	32.1			44	1-5
358	10	777-3539	M-Wp 2797	J	MP	Warrior	fo	6	110	140	148			18	16-20
359	10	777-3539	M-Wp 2432	OJ	MP	Warrior	fo, fl	9	38	81	51.6			55	1-5
360	10	777-3539	M-Wp 2418	J	MP	Warrior	fo	8	59	69	45.5	20	19		
361	10	777-3539	M-Wp 2431	J	MP	Warrior	fo	5	57	56	26.7	14	11		
362	10	777-3539	M-Wp 2435	J	MP	Warrior	fo	5	38	50	10.9	13	13		
363	9	777-3539	M-Wp 2105	J	MP	Warrior	fo, fl		21	49	11.5			29	1-5
364	9	777-3539	M-Wp 2119	J	MP	Warrior	fo	8	50	116	71.1			24	11-15
365	9	777-3539	M-Wp 2143	J	MP	Warrior	fl	6	72	124	115	29	25		
366	9	777-3539	M-Wp 2141	J	MP	Warrior	fo	5	66	127	145	23	22		
367	9	777-3539	M-Wp 2342	OJ	MP	Warrior	fo, fl	9	54	57	44.2			69	1-5
368	9	777-3539	M-Wp 2399	J	MP	Warrior	fo, fl	7	58	85	65.8			29	6-10
369	9	777-3539	M-Wp 1984	J	MP	Warrior	fo, fl	5	41	64	17.5			21	6-10

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370	9	777-3539	M-Wp 1994	J	MP	Warrior	fo, fl	6	21	64	14.5			25	6-10
371	8	777-3539	M-Wp 1429	J	MP	Warrior	fo, fl	7	32	51	14.7			24	6-10
372	8	777-3539	M-Wp 1473	OJ	MP	Warrior	fo, fl	9	43	73	63.6			143	1-5
373	8	777-3539	M-Wp 3506	J	MP	Warrior	fo, fl	5	22	57	13.1			30	6-10
374	8	777-3539	M-Wp 1171	J	MP	Warrior	fo		32	61	26.2			35	1-5
375	8	777-3539	M-Wp 1103	J	MP	Warrior	fl	6	60	97	61.1	23	21		
376	8	777-3539	M-Wp 1084	J	MP	Warrior	fo, fl	8	74	135	127			30	11-15
377	8	777-3539	M-Wp 1534	OJ	MP	Warrior	fo, fl	8	53	71	47.1			85	1-5
378	7	11009-11539	M-Wp 11014	J	MI	Carrollton	fo, fl	7	65	57	44.9	19	18		
379	7	11009-11539	M-Wp 11134	J	MI	Carrollton	fo	5	53	100	58.3			26	11-15
380	7	11009-11539	M-Wp 11451	J	MI	Moundville	fo		65	125	99.6			32	11-15
381	7	11009-11539	M-Wp 11016	J	MI	Moundville	fo, fl	5	23	60	8.2			18	11-15
382	7	11009-11539	M-Wp 11464	J	MI	Moundville	fo	6	50	100	81.5			29	11-15
383	7	11009-11539	M-Wp 11136	J	MI	Moundville	fo	6	53	94	46.5				
384	7	11009-11539	M-Wp 11135	J	MI	Moundville	fo	5	50	117	67.4			33	11-15
385	7	11009-11539	M-Wp 11009	J	MI	Oliver	fo, fl	6	87	95	80.5			29	6-10
386	7	11734-11903	M-Wp 11903	J	MI	unspecified	fl	7	41	49	19.8			44	1-5
387	7	11734-11903	M-Wp 11913	J	MI	Moundville	fo, fl	6	35	85	33			38	6-10
388	7	11734-11903	M-Wp 11744	J	MI	Moundville	fo, fl	6	52	54	32.4	24	20		
389	7	11734-11903	M-Wp 11734	J	MI	Moundville	fo, fl	7	74	72	70.2	18	15		
390	4	16150-16172	M-Wp 16159	J	MI	Moundville	fo	6	34	66	18.3			26	6-10
391	4	14150-14881	M-Wp 14510	J	MI	Carrollton	fo, fl	5	48	208	176	17	18	21	6-10
392	4	14150-14881	M-Wp 14751	J	MI	Moundville	fo, fl	5	62	84	67.5	22	20		
393	4	14150-14881	M-Wp 14246	J	MI	Moundville	fo, fl	5	56	90	50.5			19	16-20
394	4	14150-14881	M-Wp 14444	J	MI	Moundville	fo, fl	6	80	155	168			38	11-15
395	4	14150-14881	M-Wp 14808	J	MI	Moundville	fo, fl	4	26	52	8.4			29	1-5
396	4	14150-14881	M-Wp 14583	J	MI	Moundville	fo, fl		30	56	17.3			31	6-10
397	4	13139-13176	M-Wp 13172	J	MI	Carrollton	fo, fl	6	70	115	112			38	6-10
398	4	15951-16115	M-Wp 15972	J	MI	Carrollton	fo	7	74	100	122			38	6-10
399	4	15951-16115	M-Wp 15977	J	MI	Moundville	fo, fl	6	65	91	95.4	29	28	28	10-15
400	4	15951-16115	M-Wp 16047	J	MI	Moundville	fo, fl	6	69	95	70			33	6-10
401	4	15734	M-Wp 15734	J	MI	Moundville	fo, fl	5	50	112	63.5			29	11-15
402	4	12854-12901	M-Wp 12869	J	MI	Oliver	fo, fl	4	33	62	16.3			25	6-10
403	4	12854-12901	M-Wp 12855	J	MI	Moundville	fo, fl	7	44	71	46.9			32	6-10
404	4	12854-12901	M-Wp 12701	J	MI	Moundville	fo, fl	5	45	77	35			22	6-10
405	4	12854-12901	M-Wp 12854	J	MI	Moundville	fo	5	54	83	53.6			37	6-10
406	4	13992-14022	M-Wp 14022	J	MI	Moundville	fo, fl	7	39	70	37.5			25	6-10
407	4	13814-13937	M-Wp 13816	J	MI	Oliver	fo	7	45	70	36.5			35	6-10
408	4	13814-13937	M-Wp 13929	J	MI	Moundville	fo, fl	6	37	52	23.1			29	1-5
409	4	13814-13937	M-Wp 13937	J	MI	Moundville	fo	7	29	54	15.1			23	6-10
410	4	13814-13937	M-Wp 13919	J	MI	Moundville	fo	7	56	102	57.6			31	6-10

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411	4	12675-12702	M-Wp 12699	J	MI	Carrollton	fo, fl	6	77	86	55.6			19	6-10
412	4	12675-12702	M-Wp 12702	J	MI	Moundville	fo	5	79	91	72.5	25	23		
413	4	14036-14087	M-Wp 14036	J	MI	Warrior	fo, fl	7	54	78	43				
414	4	14120-14125	M-Wp 14125	J	MI	Moundville	fo, fl	5	56	96	64.5			35	6-10
415	4	12909-13059	M-Wp 12983	J	MI	Moundville	fo	5	66	95	72.3	22	20	22	11-15
416	4	16365-16411	M-Wp 16393	J	MI	Moundville	fo	7	38	78	35.8			25	6-10
417	4	12286-12328	M-Wp 12286	J	MI	Moundville	fo	5	40	75	43.7			27	6-10
418	4	15839-15917	M-Wp 15839	J	MI	Moundville	fo, fl	8	41	97	38.1			30	11-15
419	4	15839-15917	M-Wp 15859	J	MI	Moundville	fo	5	55	57	44.2	21	20		
420	4	12373-12561	M-Wp 12546	J	MI	Moundville	fo	5	46	140	80.6			25	16-20
421	4	13379-13608	M-Wp 13440	J	MI	Moundville	fo	6	46	57	22.1			16	11-15
422	4	13379-13608	M-Wp 13569	J	MI	Carrollton	fo	7	41	84	52.5			26	11-15
423	4	13379-13608	M-Wp 13598	J	MI	Carrollton	fo, fl	5	29	79	30.8			30	6-10
424	4	13379-13608	M-Wp 13578	J	MI	Carrollton	fo, fl	6	57	105	95.1			34	6-10
425	4	16464-16856	M-WP 16671	J	MI	Moundville	fo	6	33	70	37.2			30	6-10
426	4	16464-16856	M-Wp 16658	J	MI	Moundville	fo, fl	5	110	140	170			24	11-15
427	4	16464-16856	M-Wp 16524	J	MI	Moundville	fo, fl	4	83	95	60.7	20	20		
428	4	16464-16856	M-Wp 16??4	J	MI	Moundville	fo	6	57	86	53.4			28	6-10
429	4	16464-16856	M-Wp 16520	J	MI	Moundville	fo	5	86	129	102			29	11-15
430	4	16464-16856	M-Wp 16781	J	MI	Moundville	fo, fl	5	32	58	16			28	6-10
431	4	16464-16856	M-Wp 16544	J	MI	Moundville	fo, fl	5	44	109	57.4			34	11-15
432	4	16464-16856	M-Wp 16615	J	MI	Moundville	fo, fl	6	60	67	46.2	20	17		
433	4	16464-16856	M-Wp 16545	J	MI	Moundville	fo	7	60	57	42.8	20	20		
434	4	14963-15652	M-Wp 15138	J	MI	Moundville	fo	5	54	68	22.6			13	16-20
435	4	14963-15652	M-Wp 15216	J	MI	Moundville	fo	7	43	67	34.5			30	6-10
436	4	14963-15652	M-Wp 15230	J	MI	Moundville	fo, fl	4	33	60	17.5			26	6-10
437	4	14963-15652	M-Wp 15541	J	MI	Moundville	fo	5	62	99	49.4			26	11-15
438	4	14963-15652	M-Wp 15004	J	MI	Moundville	fo	5	56	106	63.3	16	16		
439	4	14963-15652	M-Wp 15366	J	MI	Moundville		6	65	102	69.5	18	17		
440	3	6333-6470	M-Wp 6419	J	MI	Carrollton	fo, fl	7	62	81	47.3			31	6-10
441	3	6333-6470	M-Wp 6470	J	MI	Moundville	fo	7	72	78	95.3	24	21		
442	3	10736-10743	M-Wp 10743	J	MI	Moundville	fo		37	106	47.3			35	6-10
443	3	8327-8569	M-Wp 8569	J	MI	Moundville	fo	7	42	83	36.9			30	6-10
444	3	8327-8569	M-Wp 8345	J	MI	Moundville	fo	6	73	111	122	26	21		
445	3	6839-6877	M-WP 6837	J	MI	Carrollton	fo, fl	7	55	124	75.1			24	16-20
446	3	6651-6663	M-Wp 6651	J	MI	Moundville	fo, fl	5	61	100	58.6			24	11-15
447	3	6651-6663	M-Wp 6663	J	MI	Moundville		5	54	33	10.9	13	13		
448	3	6482-6623	M-Wp 6568	J	MI	Moundville	fo, fl	8	51	99	69.5			38	6-10
449	3	7547	M-Wp 7547	J	MI	Moundville	fo, fl	7	88	155	166			29	16-20
450	3	7010-7281	M-Wp 7229	J	MI	Moundville	fo, fl	6	57	94	45.4			32	6-10
451	3	10913-10977	M-Wp 10913	J	MI	Moundville	fo	5	49	124	53.4			27	11-15

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452	3	10913-10977	M-WP 10926	J	MI	Moundville	fo	5	67	90	58.7	26	22		
453	3	10325-10363	M-Wp 10328	J	MI	Moundville	fo	5	72	79	35.4			27	6-10
454	3	10325-10363	M-Wp 10327	J	MI	Moundville	fo	6	82	72	90	22	19		
455	3	7758-7866	M-Wp 7806	J	MI	Carrollton	fo, fl	7	77	96	70.4	20	15		
456	3	7758-7866	M-Wp 7826	J	MI	Carrollton	fo, fl	4	66	72	48.8	16	16	18	6-10
457	3	9987-10211	M-Wp 10082	J	MI	Moundville	fo, fl	7	73	135	111	27	20		
458	2	9417	M-Wp 9417	OJ	MP	Warrior	fo, fl	10	76	90	152			79	1-5
459	2	9227	M-Wp 9227	OJ	MP	Warrior	fo, fl	10	86	120	221			81	1-5
460	2	9229	M-Wp 9229	OJ	MP	Warrior	fo, fl	11	46	114	122			83	1-5
461	2	5932-6030	M-Wp 5936	J	MI	Moundville	fo, fl	8	70	101	87.2			34	6-10
462	2	5932-6030	M-Wp 5932	J	MI	Moundville	fo, fl	4	110	125	92.5			11	16-20
463	2	3550-3935	M-Wp 3863	J	MI	Moundville	fo, fl	6	52	80	54.6			30	6-10
464	2	3550-3935	M-Wp 3791	J	MI	Moundville	fo, fl	7	58	182	123			27	21-25
465	2	5403-5458	M-Wp 5422	J	MI	Moundville	fo	6	38	101	56			30	6-10
466	2	5536-5649	M-Wp 5536	J	MI	Carrollton	fo, fl	5	97	115	108	17	17	32	6-10
467	2	9570	M-Wp 9570	OJ	MP	Warrior	fo, fl	10	60	134	188			164	1-5
468	2	5912-5920	M-WP 5913	J	MI	Moundville	fo	6	69	113	67.3			30	6-10
469	2	4604-4816	M-Wp 4725	J	MI	Carrollton	fo, fl	7	51	78	27.7			25	6-10
470	2	4604-4816	M-Wp 4727	J	MI	Moundville	fo	5	51	99	45.5			25	6-10
471	2	5739-5859	M-Wp 5768	J	MI	Snows Bend	fo, fl	4	40	82	25.5			13	16-20
472	2	5739-5859	M-Wp 5859	J	MI	Carrollton	fo, fl	5	44	79	48.6			49	6-10
473	2	5739-5859	M-Wp 5851	J	MI	Moundville	fo	6	112	90	114	18	16		
474	2	6037-6100	M-Wp 6056	J	MI	Carrollton	fo, fl	7	56	76	51.4			26	6-10
475	2	4133-4158	M-Wp 4149	J	MI	Oliver	fo, fl	6	62	102	58.9			26	6-10
476	2	4021-4120	M-Wp 4115	J	MI	Moundville	fo, fl	6	55	111	50.4			37	6-10
477	2	4210-4227	M-Wp 4215	J	MI	Carrollton	fo, fl	5	41	66	22.1			23	6-10
478	2	4828-4897	M-Wp 4828	J	MI	Moundville	fo	6	60	100	57.5	22	22		
479	1	4765	M-Wp 4765	J	MP	Warrior	fo, fl	6	101	168	137			62	6-10
480	2	782-3733	M-Wp 3483	J	MI	Oliver	fo, fl	7	93	135	156	34	26	40	6-10
481	2	782-3733	M-Wp 3204	J	MI	Oliver	fo, fl	5	62	65	33.8			17	6-10
482	2	782-3733	M-Wp 3538	J	MI	Carrollton	fo	5	50	103	48.1			30	11-15
483	2	782-3733	M-Wp 2646	J	MI	Moundville	fo	7	46	107	60.6			25	11-15
484	2	782-3733	M-Wp 3109	J	MI	Moundville	fo	7	75	105	123	25	23	22	11-15
485	2	782-3733	M-Wp 2813	J	MI	Moundville	fo	7	64	96	89.4	25	21		
486	2	782-3733	M-Wp 2831	J	MI	Moundville		5	75	52	60.6	25	24		
487	2	782-3733	M-Wp 3323	J	MI	Moundville		7	70	89	101	27	23		
488	2	782-3733	M-Wp 2266	J	MI	Moundville		5	49	55	38.7	21	19		
489	30	5024	M-Wp 5024	J	MP	Warrior	fo, fl	6	88	78	66.7	21	20		
490	30	7159	M-Wp 7159	J	MP	Warrior		6	54	84	43.4	18	15		
491	31	11057	M-Wp 11057	OJ	MP	Warrior	fo, fl	9	140	285	553			71	11-15
492	31	11132	M-Wp 11132	OJ	MP	Warrior	fo, fl	11	111	126	221			110	1-5

Case ID	Box No.	Bag No.	Accession No.	Form (J = jar, OJ = oversized jar)	Type (MP = Mississippi Plain, MI = Moundville Incised	Variety	Lip Form (fo = folded, fl = flattened)	Vessel Thickness (mm)	Sherd Height (mm)	Sherd Width (mm)	Mass (g)	Handle Top (mm)	Handle Bottom (mm)	Diameter (cm)	Arc (%)
493	31	11010	M-Wp 11010	OJ	MP	Warrior	fo, fl	8	54	87	71.8			100	1-5
494	31	10997	M-Wp 10997	J	MP	Warrior	fo, fl	5	45	51	22.2	15	14		
495	31	11045	M-Wp 11045	J	MP	Warrior	fo	6	49	77	46.1	16	16		
496	31	10523	M-Wp 10523	J	MP	Warrior	fo	8	85	118	129	23	21		
497	31	10826	M-Wp 10826	J	MP	Warrior	fo, fl	9	68	84	74	22	21		
498	31	10957	M-Wp 10957	J	MP	Warrior	fo, fl	7	94	99	86.6	23	24		
499	31	11910	M-Wp 11910	OJ	MP	Warrior	fo, fl	11	43	90	65.6			131	1-5
500	31	11748	M-Wp11748?	J	MI	Carrollton	fo	5	55	56	41.6	28	26		
501	31	11525	M-Wp 11525	J	MP	Warrior	fo	8	69	167	126			48	1-5
502	31	11545	M-Wp 11545	OJ	MP	Warrior	fo, fl	9	97	111	149			53	1-5