MODELS OF CHIEFDOM ECONOMY:

PREHISTORIC MOUNDVILLE AS A CASE STUDY

by

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ABSTRACT

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As a form of sociopolitical organization, the chiefdom has received attention for being evolutionarily the earliest form of ascriptively ranked society and as being the form out of which the earliest states developed. In large part, this attention was generated by Elman Service's study of cultural evolution. In Service's definition, the chiefdom owed its origin and persistence to the presence of a central office controlling the redistribution of the products of specialized producers who exploited geographically diverse resources. Other research, however, showed that not all chiefdoms had redistributional economies, and several alternatives have been proposed.

After reviewing the models of chiefdom economic organization, the models are compared with archaeological data from a prehistoric chiefdom centered at Moundville, Alabama, between A.D. 1050 and 1550. The hierarchically ranked nature of this society has been determined by mortuary analysis, and its geographic limits assigned on the basis of locational analyses. Extant excavation data from the paramount center and survey data from other sites in the chiefdom was complemented by excavation at one minor center, reported here. The data are consistent with local agricultural self-sufficiency and no large-scale movement of foodstuffs. Certain portions of deer carcasses, however, appear to have been preferentially provided to elite members of the society. Utilitarian craft items mostly were made domestically from local raw materials, and there is no evidence of specialization of production of these goods. Production of both utilitarian and non-utilitarian goods from non-local raw materials, in contrast, was specialized to some

degree; nearly all the working of non-local materials was restricted to the paramount center, usually to particular precincts within that site. Distribution of these goods, as well as goods made outside the chiefdom, apparently was determined by the items' function and social valuation rather than the fact that the raw material or manufacture was non-local.

This economic organization is similar to the prestige goods model of Frankenstein and Rowlands. Expectations about the dynamic behavior of an economy of this form are outlined, but limitations of the data preclude rigorous testing of the expectations.

ACKNOWLEDGMENTS

This study relies extensively on data, analyses, interpretations, and ideas provided by others. Indeed, at times while I was writing I felt much more like an impressario than an analyst. Expressing my gratitude to all those individuals and institutions who have contributed to this study is rather challenging, there being so many of them. It is, however, a very welcome challenge.

Foremost, I wish to thank Dr. Christopher S. Peebles, for more than anyone else he is to blame for my involvement in the archaeology of Moundville. In February or March of 1978 I inquired whether there was room for me on Chris's Moundville field crew for that summer. Chris's answer was, "Oh good! You can figure out what equipment we need and buy it. You have $600." This was a little disconcerting, since I had had no experience in organizing, outfitting, or directing fieldwork. With his assistance, however, I managed to muddle through without procuring too many useless bits of hardware. Unaccountably, through the years Chris has continued to provide me with such opportunities to make an idiot of myself, and does not seem to have been bothered when I have done so. His patience, intellectual guidance, and friendship have been deeply appreciated.

I also with to thank Dr. Henry T. Wright, who chaired my dissertation committee and served as principal investigator for the NSF grant which principally funded my fieldwork. This study is a fragment of a more complex and sophisticated research problem Henry suggested to me in the summer of 1982 as a possible dissertation topic. Lacking his analytical flair, however, I could not see how to address the more complex, and more interesting, aspects of the problem with the available archaeological materials. Knowing that these aspects remain to be examined, however, has helped convince me that there is life beyond the dissertation and has left me eager to do further research. I am grateful for such encouragement and for his support throughout my graduate career.

A number of individuals and institutions provided assistance or support for the fieldwork on which this study is based. Funding for excavation at the White site was provided by grants from the National Science Foundation (grant no. BNS-8305514) and the H.H. Rackham School of Graduate Studies at the University of Michigan. The success of the excavation, despite often uncomfortable circumstances, is a direct result of the hard and careful work of the crew: Nora Bessler, Thomas Maher, Susan Pollock, Ken Sasaki, John Shafer, Tristine Smart, and David Wallace. For assistance ranging from temporary housing, to the loan of a water pump, to 27 truckloads of gravel, I thank the following: Mr. Carey B. Oakley and the staff of the Office of Archaeological Research of the University of Alabama; Dr. Joseph O. Vogel, then Director, and Mr. Phil Krebs of the Alabama Museum of Natural History; the Department of Anthropology of the University of Alabama, then chaired by Dr. C. Earle Smith; and Mr. Clifton Abernathy of the Hale County office of the Alabama Highway Department. I thank Mr. James F. White for his permission to excavate at the White site. For the loan of a stove, for trucking our equipment into the site, and for his countless kindnesses to myself and the crew, I am grateful to Mr. Troy Beatty, Fish and Game Officer for Hale County.

Analyses of botanical and faunal remains are important parts of this study. C. Margaret Scarry identified several samples of botanical remains from the White site and provided comparative data from her excavations at Moundville. Scott Blanchard identified the faunal remains from the White site excavations, and Susan L. Scott and Karen M. Mudar provided age-at-death estimates for deer teeth based on dental wear. The high quality and timely completion of these tasks is greatly appreciated. Though these individuals provided the identifications of the faunal and botanical remains, the subsequent analyses of these data are entirely my own, as are any shortcomings therein.

Several individuals graciously gave me access to unpublished data, some of which appears herein. Dr. Tandy K. Bozeman allowed me to use the computer file containing the 1978–79 Moundville survey data. Dr. C. S. Peebles similarly gave me access to the computer file containing the Moundville burial data. Dr. Vincas P. Steponaitis sent me a full list of the sets of vessels from Moundville identified by himself and Dr. Margaret Hardin as having been decorated by individual artisans. He also suggested the statistical procedure I used to determine whether these vessel sets would likely have been recovered if there had been no specialization in the production of these pots. Dr. Mary L. Powell sent me the revised age and sex assessments for the Moundville burials listed in Table 3.6. None of these individuals should be held responsible for the uses to which I put their data.

The members of my thesis committee contributed greatly to this study by examining it critically and making extremely useful suggestions for its improvement. This is true not only of Drs. Henry T. Wright, Christopher S. Peebles, and John D. Speth, who were the nucleus of the committee, but also of Drs. Jeffrey R. Parsons, Karl Hutterer, James B. Griffin, and William R. Farrand, who joined or left the committee at various stages. I thank the entire committee for their speed in reading and commenting on my work, and for permitting a dissertation defense only two weeks after the draft was finished.

Finally, it is my pleasure to admit that without the assistance of my friends I would never have finished this dissertation. Interminable phone conversations with Margaret Scarry saved me from making many insupportable statements and analytical blunders; without her friendly criticism my thinking about the prehistory of Moundville would be as firmly stuck in the mud as my 1983 field vehicle often was. I have also benefitted tremendously from discussions with Vincas Steponaitis. His advice has been extremely useful and welcome, even when it was serious. My colleagues in Ann Arbor have helped me in myriad ways, from attending potsherd-washing parties to lending me a personal computer. I am particularly grateful to Susan Pollock and Carla Sinopoli, whose friendship bore me through all the crises of field and lab.

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CHAPTER I

INTRODUCTION

This study combines archaeological site catchment and locational data, stylistic, technological, and functional analysis of artifacts, and analysis of botanical and faunal remains in an effort to reconstruct the economy of a prehistoric chiefdom. There are several reasons for undertaking this study, beyond merely adding to our knowledge of past lifeways. Among students of cultural evolution there is widespread agreement that the chiefdom is the form of sociocultural organization from which the first states evolved (e.g., Sanders and Price 1968; Flannery 1972; Service 1975; Wright 1977, 1984; Carneiro 1981). The origin of the state being a persistent focus of research in the social sciences, much of the attention focused on chiefdoms has concerned the way(s) chiefdoms may be transformed into states. On the other hand, archaeological and ethnohistorical records from Polynesia, the southeastern United States, and Europe during the Bronze and Iron Ages make it clear that the chiefdom level of sociocultural integration may be the dominant form of political organization in a region for hundreds or even thousands of years, with no autochthonous evolution of states. Individual chiefdoms come and go on a time scale of a few hundred years at most, but the region as a whole continues to be characterized by this form of polity. Chiefdoms, thus, are of interest not only because they evolved into states, but also because much more frequently they did not. The persistence of this form of sociocultural integration is itself a matter of interest.

Researchers use the term "chiefdom" to denote non-state societies with ascriptive hierarchical ranking. A brief review of the history of the term, as well as a more specific definition, are presented in Chapter II. That chapter also documents the fact that while there is consensus on the form of political organization denoted by the term, there is disagreement about the economic organization of such polities. From an anthropological perspective, this is surprising. As a non-market society, the economy of a chiefdom is not a realm of relationships and interactions separable from other aspects of social interaction. This is the basic tenet of the "substantive" school of economic thought (see Polanyi 1957a, 1957b; Fusfeld 1957; Dalton 1961; Firth 1965; Forde and Douglas 1967; Sahlins 1972). As Dalton (1961:21) put it, economic relations are the manifestations of social relations. Since chiefdoms, to use Service's (1971:145) phrase, are characterized by "pervasive inequality of persons and groups", material transactions between such persons or groups are inherently as much political as economic in nature. Therefore, the current situation in anthropology is that there is agreement about the political structure of chiefdoms but disagreement over the structure of their political economies, despite the fact that the political economy is a material manifestation of political relations.

The debate about the structure of chiefdom economy has revealed that the ethnographic and ethnohistorical record contains considerable ambiguity about actual transactions in chiefdoms. Hawaiian chiefdoms, for example, have been cited as supporting contradictory economic models. Ambiguity can stem from the naive imposition of Western concepts on non-Western social settings, acceptance by the observer of chiefly ideology as an accurate representation of the actual economy, the short time-span and narrow geographic basis of observations, and probably other factors as well. Since chiefdom societies can no longer be observed at first hand, the only new evidence to bring to bear on the issue is archaeological. This, however, is easier said than done.

For archaeological data to be of help in determining how chiefdom economies were structured, the data must meet certain criteria. First, it must be shown that the data derive from a society that was organized as a chiefdom. This demonstration must be made on the basis of non-economic criteria, in order to avoid logical circularity. Second, the archaeological data should be as direct as possible. Archaeological data are never fully direct evidence of past behavior, but rather byproducts of, or patterned to some extent by, past behavior. However, some data are less indirect than others: the identification of preserved agricultural field patterns and recovery of macroscopic remains of domesticated plants, for example, provide more direct evidence of an agricultural economy than does an association of settlements with fertile soils. A third criterion that must be met is that the archaeologist must be able to determine what social context the data provide information about. For example, it is important to know whether a refuse deposit contains refuse from a chiefly residence or debris from a low-ranking household. A fourth criterion is related to this point; there should be data from as many distinct social contexts as possible. Since the controversy over chiefdom economies concerns the pattern of movement of goods between settlements as well as between levels in the social hierarchy, there should be data from each type of settlement in the settlement system.

Few sets of archaeological data meet these criteria. In effect, what is required is multidisciplinary analysis of data from multiple sites, where chronology and political geography are understood, and where there is a sound, non-economic basis for inferring the form of political organization. Such sets of data are most likely to be generated when researchers with complementary interests and skills work under the guidance of an integrated research design. Just such a group of scholars has studied the Mississippian chiefdom centered at Moundville, Alabama. Information they have furnished, in combination with data from my own fieldwork, make the Moundville case one of the few sets of archaeological data that meet the criteria outlined above. The archaeological record of the Moundville chiefdom is examined to provide, as fully as possible, answers to the classic questions of political economy: who produces what for whom, and how is it transferred from producers to consumers? In order to focus these questions more sharply, and cast them in terms appropriate to chiefdom economies in particular, the debate over the structure of chiefdom economies is reviewed and those models extant in the literature are outlined. The contrasts between the models serve as the source of the questions explicitly posed of the archaeological data. A model of the structure of the prehistoric Moundville economy is then built from the answers to these questions, and the logical implications of this structural model are explored.

This is essentially a case study. It is not designed to provide an indication about how all chiefdom economies were structured. Rather, the goal is to determine how one particular chiefdom was organized. With this information in hand, further issues can then be addressed, such as determining what factors might lead to instability and collapse of this economy. This study is merely one step towards the goal stated at the opening of this chapter, namely, elucidating the causes of persistence or transformation of chiefdoms.

The study is organized as follows. The controversy over chiefdom economies is reviewed in Chapter II. Alternative models are described and their contrasting features made explicit. Chapter III introduces the archaeology of the Moundville chiefdom and describes the strengths and weaknesses of the extant data. The excavations I directed to complement these data are also described. Subsistence data are analyzed in Chapter IV, including catchment analysis and analysis of faunal and botanical remains from the Moundville paramount center and a subsidiary site. The production and distribution of craft items is examined in Chapter V. The final chapter, VI, summarizes the results of the study and addresses two further issues: the external economic relations of the Moundville chiefdom, and the dynamic behavior of the Moundville economy.

CHAPTER II

THEORETICAL BACKGROUND

Introduction

The term "chiefdom" came to have a technical meaning in anthropology during the 1950s. Carneiro (1981) has recently reviewed this process, and interested readers are referred to his article for details. Briefly, Oberg (1955) and Steward and Faron (1959) first used the term in a defined sense, to denote ranked, multi-village polities headed by a paramount chief. It was Elman Service, however, who firmly established the term in our lexicon when he used it to denote one of the four classificatory/evolutionary stages in his highly influential Primitive Social Organization (1971 [1st ed. 1962]). Service's definition of a chiefdom is too protracted to quote in its entirety, but the main points are present in the following passages:

> The most distinctive characteristic of chiefdoms as compared to tribes and bands, is, as discussed earlier, the pervasive inequality of persons and groups in the society. It begins with the status of chief as he functions in the system of redistribution. Persons are then ranked above others according to their genealogical nearness to him. Concepts involving prescriptions, proscriptions, sumptuary laws, marriage rules and customs, genealogical conceptions, and etiquette in general combine to create and perpetuate this sociopolitical ordering, and in turn have an effect on social structure and status terminology and etiquette behavior. (1971:145–146)

> The basic ordering of society, then, is hierarchical. The society is composed of individuals, families, kin groups or villages, and lineages which are unlike each other. The relations, expectations, forms of etiquette, frequently even the kinds of dress and ornamentation prescribed for each extend, make explicit, and emphasize social differences. (1971:148)

> A chiefdom occupies a level of social integration which transcends tribal society in two important respects. First, a chiefdom is usually a denser society than is a tribe, a gain made possible by greater productivity. But second, and more indicative of the evolutionary

> stage, the society is also more complex and more organized, being particularly distinguished from tribes by the presence of centers which coordinate economic, social, and religious activities. (1971:133)

> The increased productivity and greater population density of chiefdoms are not necessarily due to any particular technological development, although in some instances it is apparent that such development did take place. More frequently, and in all cases importantly, the rise of chiefdoms seems to have been related to a total environmental situation which was selective for specialization in production and redistribution of produce from a controlling center. (1971:133–134)

> ...specialization and redistribution are [not] merely adjunctive to a few particular endeavors, but continuously characterize a large part of the activity of the society. Chiefdoms are <u>redistributional</u> <u>societies</u> with a permanent central agency of coordination. Thus, the central agency comes to have not only an economic role—however basic this factor in the origin of this type of society—but also serves additional functions which are social, political, and religious. (1971:134, emphasis in original)

> Who is the redistributor? This is obviously a position of responsibility and judgement. Leaders can exist for special purposes at any level of society and tend to rise in any cooperative program of action. The redistributor in the beginning would be likely to be that person who is ascendant in community service in the particular endeavor—probably the man who contributes the most to it. At any rate, when the person as redistributor is in that position consistently the situation changes. He begins as redistributor because of prestige achieved as a contributor or some other role; finally, he holds status because he <u>is</u> the redistributor. As the system develops and specialization and redistribution become a necessary and integral part of the social and economic scheme, this central office confers very high rank. (1971:139)

Service argued that redistribution was the cause for the evolution of chiefdoms and was the way that chiefdom economies functioned. Other researchers have called into question the nature or even presence of redistribution in pre-state societies. Service's chiefdom concept has proven so useful in anthropology, however, that even those who disagree with the importance of redistribution continue to use the term "chiefdom" for societies with social, political, and religious characteristics more or less as outlined by Service (e.g., Taylor 1975; Peebles and Kus 1977; Earle 1977, 1978; Steponaitis 1978; Carneiro 1981). I follow this practice by accepting Wright's (1977:381, 1984) definition of a chiefdom as a sociocultural formation with a decision-making hierarchy lacking internal differentiation and having no more than 2–3 levels above the level of local production and local social process. While Wright went on to suggest a "dominant strategy" for the economy of such an entity, economic structure is not a component of, nor entailed by, the definition. This leaves the issue of economic structure as a question which can be answered empirically. Contrasting models of chiefdom economy, including redistribution, are reviewed in this chapter.

Redistribution

In addition to reviewing the history of the chiefdom concept, Carneiro (1981:58–63) traces the intellectual route by which redistribution came to be a fundamental component of Service's chiefdom definition. Briefly, Carneiro attributes the origin of the redistribution concept to Thurnwald (1932). Polanyi (1957b) elaborated on the concept, and Sahlins, much influenced by Polanyi, made it an important feature of his analysis of Polynesian societies:

> Everywhere in Polynesia, the chief is the agent of general, tribal-wide distribution. The chief derives prestige from his generosity. In turn, his prestige permits him to exercise control over social processes, such as production, upon which his functions of distribution rest. Consequently, the greater the productivity, the greater the distributive activities of the chief, and the greater his powers. (Sahlins 1958:xi)

Because Service was "strongly influenced" by Sahlins's study, Carneiro contends, redistribution was given central importance in Service's definition of the chiefdom. Indeed, Service (1971:134) cited Sahlins's study as an example of the role of redistribution in Polynesian chiefdoms.

There is, however, another obvious reason that redistribution has been seen as a basic feature of chiefdoms. Many ethnographies and ethnohistories of chiefdom societies describe a flow of goods that is suggestive of redistribution. For example, we find the following statements about the Bemba of southeastern Africa, the Polynesian chiefdom of Moala, and the Natchez of the southeastern U.S., respectively:

> The whole institution of the [sacred kitchen of the chief] illustrates to my mind that close association between authority and the power to distribute provisions on which the tribal organization depends. The

> chief owns the food and receives tribute, and the chief provides for his subjects and distributes cooked food to them. (Richards 1961:150)
>
> ...the chief mobilized not only the labor of his own large household but likewise that of his subordinate chiefs and their kin. Thus, the paramount would collect a significant amount of the surplus production of the community and redistribute it in the general welfare. In this way he achieved prestige and bolstered his political status. Moreover, in contracting to subsidize the general welfare, his activities stimulated the general productivity. (Sahlins 1962:294)
>
> Once in the summer, toward the end of July, the people gather by order of the great chief to be present at a grand feast which he gives them. This festival lasts for three days and three nights, and each one contributes what he can to furnish it; some bring game, others fish, etc. (Le Petit, quoted in Swanton 1911:122)

For Service, however, redistribution did not mean merely the movement of goods in to the chief and then back out again. Rather, redistribution was a means of coordinating specialized producers. The chiefdom was seen as being composed of productive units, be they villages or districts, each of which specialized in producing a specific set of goods. None of the productive units were self-sufficient, and redistribution was the mechanism by which each of the units received those goods necessary for survival which they did not themselves produce. Each unit passed a substantial amount of their products to a central location, where the chief recombined the varied products and parcelled them out so that each unit received the complete suite of the goods they needed.

Redistribution, Service argued (1971:136, 1975:75–78), would typically arise in settings of sedentary communities in a region of geographically diversified resources. Several other possibilities were noted, such as redistribution coordinating diversified, specialized producers in a geographically homogeneous environment (Service 1975:77, footnote 5), and allocation of the products resulting from communal but complexly specialized, centrally directed, labor (1971:136–137). Little space was devoted to describing these alternatives, and Service (esp. 1975:75–78) made it clear that he considered them informative but atypical.

In its classic sense, then, redistribution is the centrally directed re-allocation of necessary goods to non-self-sufficient, specialized producers, typically in a geographically diversified setting. This pattern of movement of goods is presented in schematic form in Figure 2.1. The figure depicts a chiefdom with a paramount center and four districts each with a local center. A portion of the produce of each domestic unit is passed to the local center and thence to the paramount center. There, the products are recombined and sent to the local centers for distribution to the producers. The goods being moved are labelled "subsistence goods", but in addition to foodstuffs they may include any items necessary for the physical reproduction of society, such as agricultural and hunting implements, cooking utensils, and winter clothing. Movements of items of primarily social or symbolic value, such as sumptuary goods, are not shown in Figure 2.1, since Service did not discuss the production of these goods.

Alternative Models

The redistribution model was widely accepted as the economic structure of chiefdoms until the mid-1970s (see, for example, Fried 1967:116–118). Perhaps the first challenge to this assumption was made by Taylor (1975). In her comparative study of east and central African polities, she found that:

> The middle-range hierarchical societies of the present sample are not typically differentiated and redistributive societies as delineated in the... "chiefdom" model... . In all the societies of this sample, including most of the centrally organized ones, local groups tend to be very largely self-sufficient, and to provide most or all of their own material needs. Chieftaincy in this sample is not typically characterized by the central coordination of the specialized activities of unlike parts of the whole. (Taylor 1975:35–36)

Curiously, Taylor's study was not generally cited in the literature on chiefdoms until the 1980s.

The next two studies to take issue with the redistribution concept were both based on Hawaiian data and appeared in 1977. Earle (1977, 1978) showed that community territories in Hawaii were structured so as to maximize environmental diversity within the territory and minimize differences between territories. This, together with the traditional community social organization, permitted each community to be self-sufficient. The second

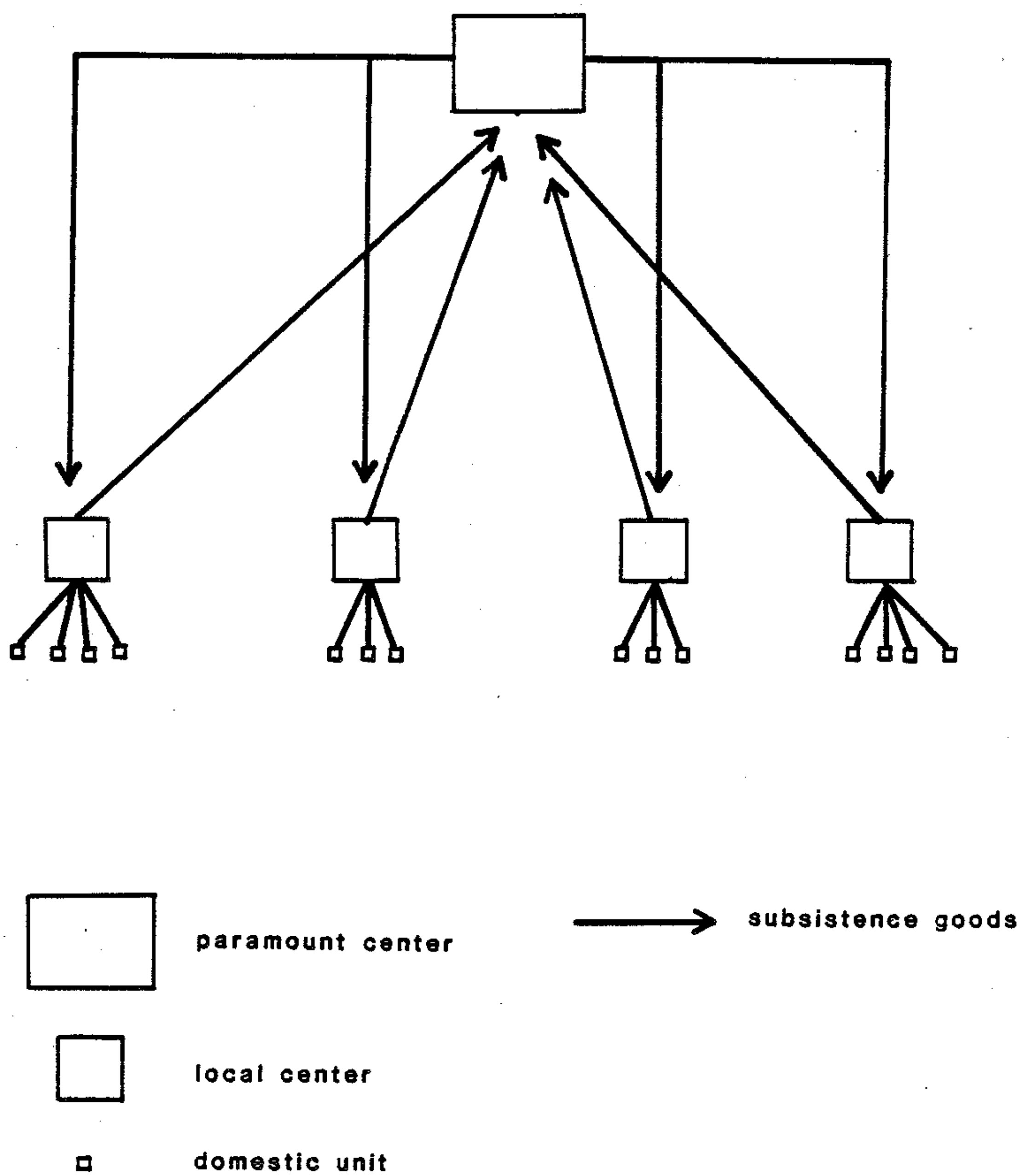


Figure 2.1

Schematic diagram of the classic redistribution model study, by Kus (Peebles and Kus 1977), marshalled ethnohistorical evidence to show that, while substantial quantities of food and craft items were provided to the paramount chief by each community, these goods were not redistributed throughout the chiefdom. Rather, they were used almost exclusively to support the paramount, his court, and his army. Both of these studies concluded that the redistribution model was inaccurate, at least for Hawaii. This conclusion was particularly significant because Hawaiian chiefdoms were among the most complex known, and were widely taken as paradigmatic examples of the chiefdom construct.

Since 1977 there have been other studies taking issue with the presumed association of chiefdom political structure and redistributional economy. Helms's (1979) analysis of ethnohistorical records from Panama showed that area to have been occupied by a network of chiefdoms at the time of Spanish contact. The ethnohistorical records, however, contain no mention of redistribution-like activities (Helms 1979:14–15). Similarly, Steponaitis's (1978:421–426) review of the relevant ethnohistoric information revealed that redistribution was not the basis of the political economy in the Society Islands (Tahiti) or among the Natchez of the southeastern U.S. And, from their comparative analysis of New World pre-state societies, Feinman and Neitzel (1984:56) concluded:

> ...redistribution is clearly not the central function of leadership in sedentary prestate societies. Weak leaders only occasionally redistribute; and although the importance of redistribution increases among strong leaders, this activity is not shared by all of them... It should be noted that [here], "redistribution" refers to a diverse set of activities. If by "redistribution" one implies merely the distribution of food and other goods by leaders [i.e., classic redistribution], then the relative importance of this task is diminished further.

From these studies it has become clear that the classic redistribution model does not accurately describe the structure of some, perhaps most, chiefdom economies. As noted above, Service never claimed that <u>all</u> chiefdoms were redistributional, but he did state that redistribution was the typical economic structure. Moreover, some of the societies he cited as examples of redistributional economies are among those that other researchers have argued were not redistributional. Much of the controversy is undoubtedly due to ambiguity in the ethnographic and ethnohistoric record. For example, I quote above a passage from Richards (1961) which purports to show that redistribution was important among the Bemba. In fact, however, Bemba chiefs distributed food primarily to "tribute workers, courtiers, executive officials, or visiting councillors on tribal business" (Richards 1961:147), rather than to economically diversified outlying communities. The critiques of the redistribution concept have made it clear that an accurate understanding of the economic structure of chiefdoms must be based on detailed, quantitative information about the loci of production and use or consumption of goods, combined with information about the mode of distribution. Since such information is not generally available in ethnographic and ethnohistoric records, the issue must be resolved with archaeological data.

In addition to casting doubt on the ubiquity or presence of redistribution in chiefdoms, the studies cited above (plus others) proposed alternative models of chiefdom economy. Unlike the redistribution model, these models deal with the production and distribution of craft items and prestige goods as well as with food and utilitarian items. Though there are two contrasting models of the production and distribution of prestige goods, both models posit the same pattern of subsistence economy. This pattern is one of local self-sufficiency with mobilization of tribute.

The reassessments of ethnography and ethnohistory that cast out redistribution (Taylor 1975; Peebles and Kus 1977; Earle 1977, 1978) concur in finding that local units in a chiefdom are largely or wholly self-sufficient in average years. Exchanges between units were based on reciprocity and did not involve the administrative hierarchy (Peebles and Kus 1977:424–425; Earle 1977:224–225). Chiefs did receive tribute of foodstuffs (Taylor 1975:37–39; Peebles and Kus 1977:425–426; Earle 1978:187–190), or labor to produce food for the chief's use (Helms 1979:14). Figure 2.2 schematically diagrams these flows of subsistence goods. Following Earle (1977:215–216; cf. Dalton 1961) I refer to this economic model as mobilization.

One aspect of the economic model outlined by Earle and Peebles and Kus is not shown in Figure 2.2, specifically, buffering against environmental fluctuation. The most general buffering mechanism in chiefdoms is the maintenance of large stores of food by the chief, which are used to support individuals in need (Taylor 1975:38; Peebles and Kus 1977:430–431; Helms 1979:11). In times of subsistence shortfalls exceeding the buffering capacity of the chiefly stores, chiefs may also exploit external political connections to obtain "disaster relief" (e.g., Sahlins 1962:369; Spillius 1957). As a component of the mobilization model, buffering would be shown in Figure 2.2 as movement of subsistence goods from the paramount center to individual domestic units. Buffering (in the form of chiefly storage) was also a component of the redistribution model (Service 1971:139). This episodic movement of subsistence goods has been left out of Figures 2.1 and 2.2 in order to make clear the contrasts between these two diagrams.

Just as there are models of the movement of subsistence goods, there are models of the production and distribution of craft items. Two contrasting models have been articulated by Wright (1977, 1984; see also Peebles and Kus 1977) and by Frankenstein and Rowlands (1978). Before reviewing these models, a short discussion of nomenclature is necessary. Since these models are referred to repeatedly in this study, it is convenient to have short, simple names for them. Names for these models are not yet established in the literature, and the most obvious candidate terms do not intrinsically convey the significant distinctions between the two models. Frankenstein and Rowlands (1978) refer to their model as a "prestige goods economy." Rather than proliferate terms, I follow their lead; however, it must be kept in mind that "prestige goods model (or economy)" specifically designates the Frankenstein and Rowlands model and not just any model of the prestige goods sector of an economy. Wright (1984) uses the term "tributary economy" in connection with his model of Hawaiian political economy. Though he did not use the term in a definitional sense, I adopt "tributary" as a label for the model he presented. Though it has the disadvantage of sounding as if it denotes the economy of a tributary polity, which

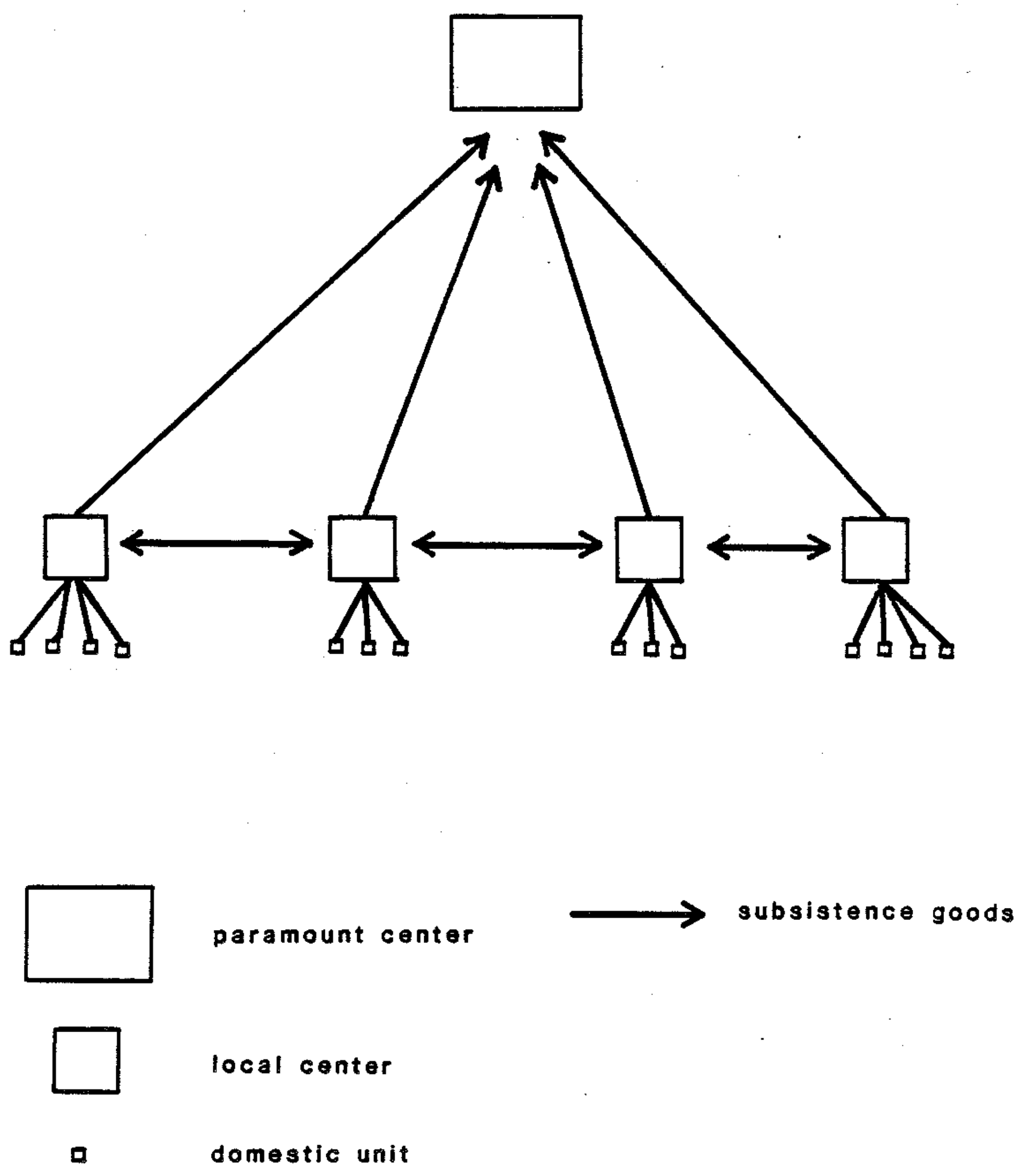


Figure 2.2

Schematic diagram of the mobilization model is not intended, it has the advantage of focusing attention on the movement of tribute goods.

The tributary model outlined by Wright (1977:381–382, 1984) is explicitly a re-expression of Peebles and Kus's (1977) interpretation of Hawaiian economic structure. Aside from presenting the model in more abstract terms, it differs from the Peebles and Kus formulation only in focusing on the direct and, particularly, the indirect feedback mechanisms inherent in the model. Wright (1984) describes the model with admirable clarity:

> [While] food and goods are extracted as tribute from producers, actual distribution is characteristically to lesser figures within the chiefdom, rather than to the whole populace, and the redistributed items are often goods made by specialists, either part-time specialists locally supported by commoner production or full-time specialists supported by chiefs using some of the tribute extracted from producers. One can reason from this that if local production falters, then local subsistence producers would have to spend more time in more intensive food producing activities and less time on craft work. At first the movement of craft goods upward toward the paramount would decrease; if the crisis deepened, the flow of subsistence goods also would decrease. The first general material manifestation of a local problem would be a decrease in the exhibition of chiefly generosity to the lesser nobility and their followers (cf. Wright 1977:382). Similarly, decreases in the distribution of centrally produced goods would signal falloff in the paramount's income and therefore a deepening production or managerial crisis, and decreases in goods imported from other polities would signal falloff in inter-chiefdom exchange and thus diplomatic failures. Such deficits could be expected to motivate either chiefly reforms, internal rebellions, diversionary declarations of war on neighbors, or various other responses, depending on the particular local situation. Any of these actions would lead to a new adjustment between production and tribute demands.

The tributary model of production and distribution of craft items is shown in Figure 2.3. The pattern is superficially similar to that shown in Figure 2.1, but in addition to dealing with different kinds of goods, there are three ways in which this pattern differs from Figure 2.1. First, the four districts do not produce mutually exclusive sets of craft items. Second, all four local centers receive from the paramount the same set of craft items, and this set includes only a subset of the range of items available to the paramount either from tribute or from exchange with external polities. The third difference between this pattern and that shown in Figure 2.1 is that none of the items distributed by the paramount to the local centers reaches the level of the domestic units. Instead, all the distributed craft items are kept by the local nobility.

Unlike the models described above, the prestige goods model of Frankenstein and Rowlands (1978) is not presented as an ethnographic or ethnohistoric case study. It is, rather, presented as a logical construct based on the observation that political power is often associated with control over access to foreign goods which have been assigned high status:

> The specific economic characteristics of a prestige goods system are dominated by the political advantage gained through exercising control over access to resources that can only be obtained through external trade. However, these are not resources required for general material well-being or for the manufacture of tools and other utilitarian items. Instead, emphasis is placed on controlling the acquisition of wealth objects needed in social transactions, and the payment of social debts. (Frankenstein and Rowlands 1978:76)
>
> ...a dominant chief can reinforce control over the internal circulation of wealth objects by narrowing down and monopolising the range of items acceptable in social transactions within his domain. The use of domestic wealth objects will be devalued and restricted to relatively minor social transactions, and a sphere of foreign wealth objects will be formalised to take their place. The exchange of luxuries consumed by emergent elites, reinforced by sumptuary laws, will form an important part of the process. By controlling the size of payments or the form in which payments are made and the supply of elite status items, leaders confirm their superordinate status over the heads of segments within their own descent groups and over other dependents. The chief's control over external trade in wealth objects is absolute so that he alone obtains commodities from a foreign source which he can then redistribute in the form of status insignia, funerary goods, bridewealth, etc. (1978:77)
>
> This serves to emphasise the importance of political control over the domestic resources that form the source of exchangeable wealth for external trade. Under these conditions, there will be a tendency to select for those resources that are not found to be distributed evenly and can therefore be more easily controlled. The exploitation of metals, salt, shells, stone, etc., within a domain would be controlled and the products passed up as tribute through the political hierarchy to a superordinate chief, who would use them in external trade. (1978:77)

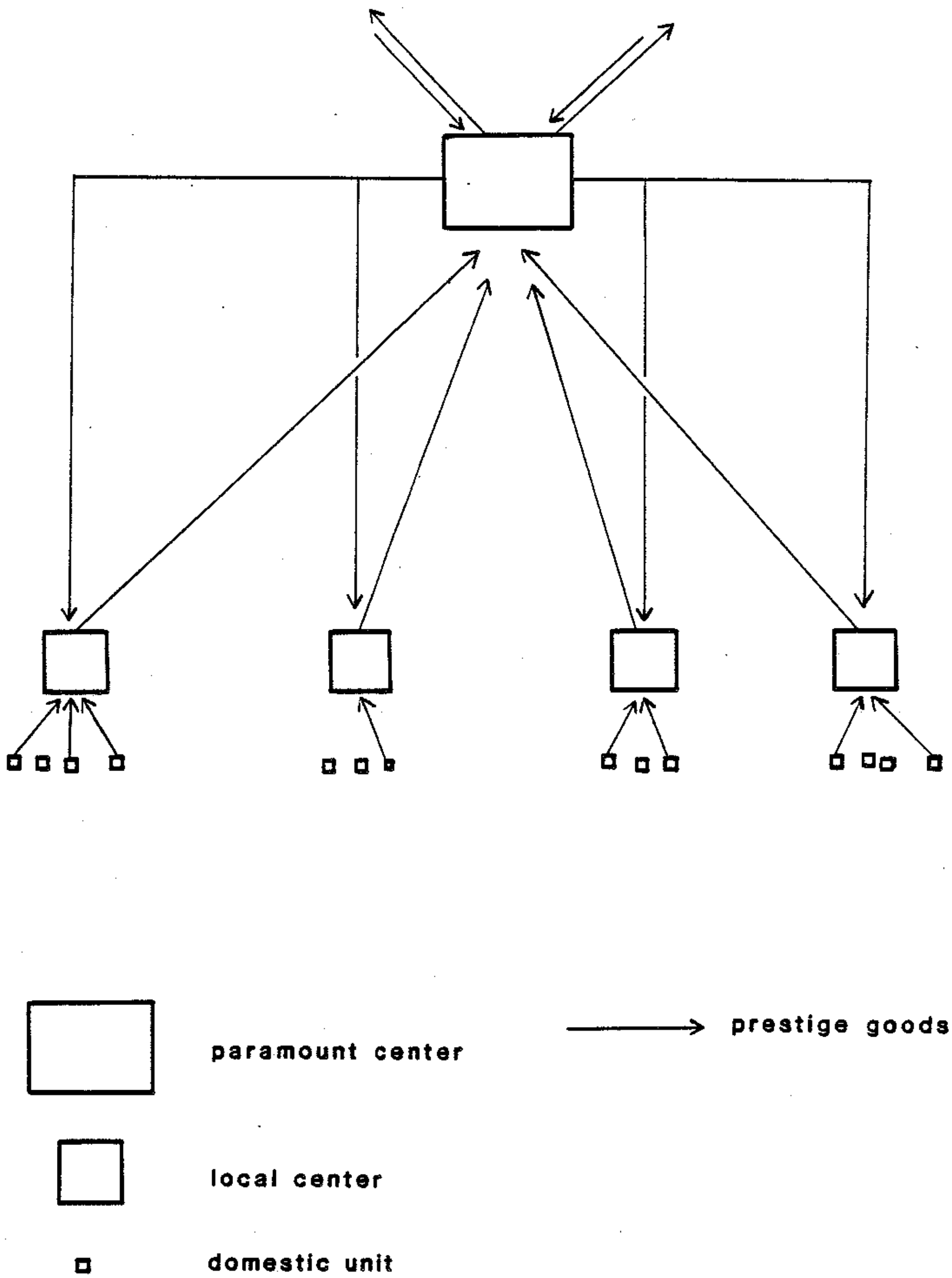


Figure 2.3

Schematic diagram of the tributary model

This model is diagrammed in Figure 2.4. Note that locally produced crafts passed to the paramount as tribute do not circulate within the chiefdom, and that only a subset of the non-local prestige goods available to the paramount are distributed to the local nobility.

Conclusion

The models diagrammed in Figures 2.1 – 2.4 are, of course, not the only conceivable models. There is a large number of ways to draw arrows between the boxes which represent levels of the settlement hierarchy. For example, the patterns do not have to be symmetric; one local center might stand out in contrast to the others, or the nature of tribute flows and redistributed goods might vary with distance from the local center to the paramount site (cf. Steponaitis 1978:444–449). Furthermore, each of the diagrams represents only one sector of a functioning economy, either the prestige goods sector or the subsistence sector. These partial models can be combined in four discrete ways—many more if the combinations are mixed or asymmetric. Actually, both Wright (1977, 1984) and Frankenstein and Rowlands (1978) argue that their models of prestige good production and distribution are associated with subsistence economies of the mobilization type. Thus, there are actually only three discrete models in the literature: the classic redistribution, mobilization + tributary, and mobilization + prestige goods models.

Despite the differences in their structure, each of these models focuses on roughly the same set of issues. Minimally, these issues include the following:

1) Are the settlements within a chiefdom self-sufficient in production of food and other necessary economic goods, or is there complementary specialization of the production of these goods?
2) If there is complementary specialization of production of necessary economic goods, how are the goods distributed? Specifically, are the goods transferred by direct exchanges between producers and consumers, or is the distribution effected by a central manager (the chief)?
3) Is there mobilization of subsistence goods to support the elite?

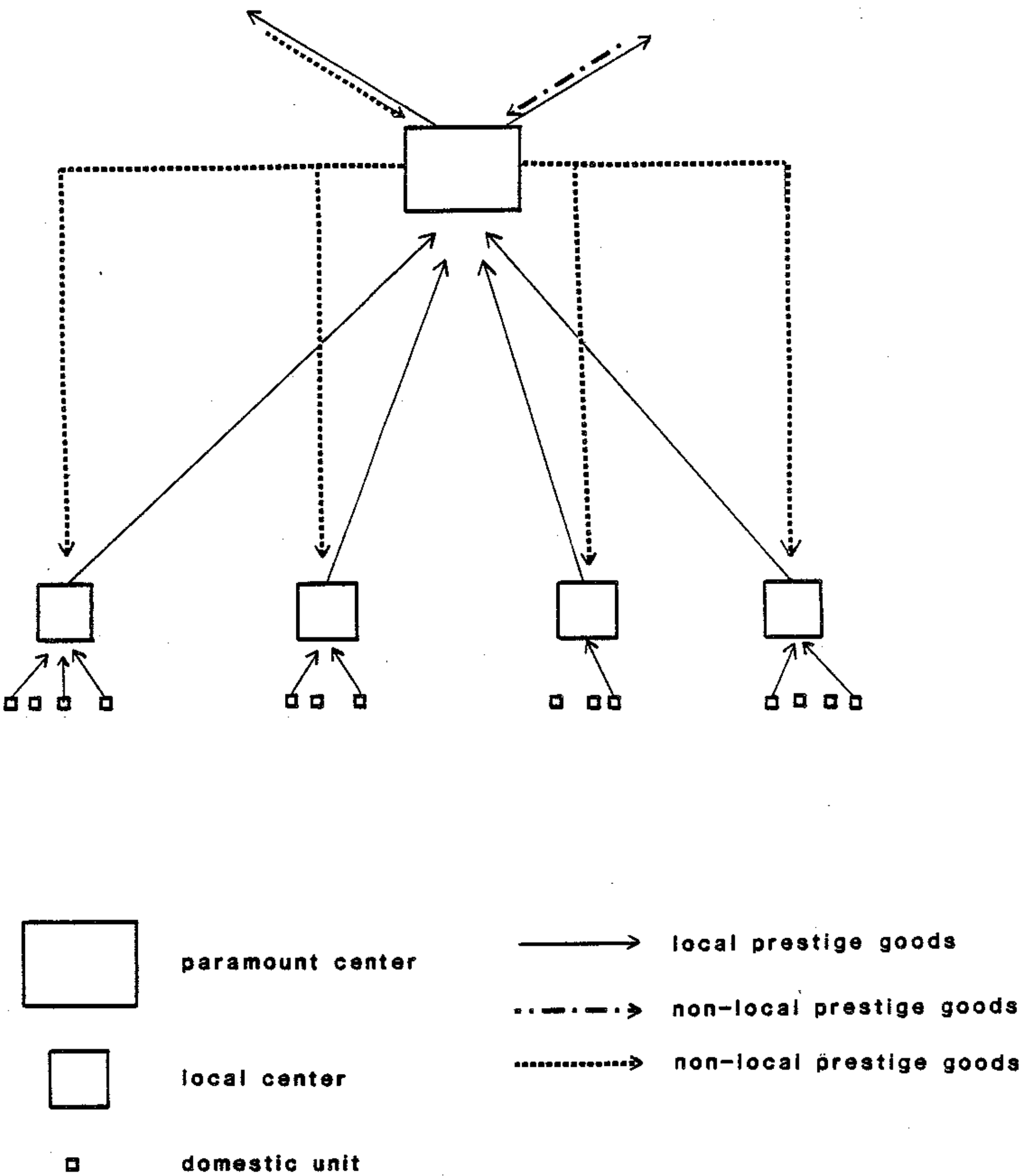


Figure 2.4

Schematic diagram of the prestige goods model

4) Is there specialization of production of craft items? How are craft items distributed?

5) Is the mode of production and distribution of prestige goods different from that of utilitarian items?

6) How do non-local goods enter the chiefdom and how are they distributed?

By obtaining answers to these questions from any particular chiefdom, we can determine which aspects of the economic models are accurate in that particular instance. The goal of such research, however, should not be to determine which model is the "real" economic structure of a chiefdom. These models are ideal types. Historical, contingent factors in specific past sociocultural formations can be expected to result in economies that differ from these ideal types. Moreover, the reason for constructing models is not to obtain a completely accurate representation of an actual economy. Models are logical constructs that have calculable properties given certain theoretical assumptions. To the extent that an actual economy conforms to a particular model, we would expect the properties of the model also to apply. By evaluating these expectations against actual economic data, we can determine whether our theoretical assumptions are in need of revision.

As logical constructs, the models discussed here have contrasting implications about the causes of stability and change in chiefdoms. For example, maintenance of the social hierarchy in a chiefdom with a mobilization + prestige goods economy is dependent upon continuing external exchange. In contrast, external exchange is not required for a classic redistributional economy. The models also differ in terms of whether economic stability would be perturbed by such factors as localized crop failure, geographically uneven demographic change within the chiefdom, and intentional manipulation by competitors for the paramountcy.

To anticipate the results of the Moundville case study, the economy of the Moundville chiefdom differs sufficiently from each of the models discussed above that the implications for the dynamics of the economy differ from the implications of each of the models. In recognition of this, discussion of these implications is deferred until a model of the Moundville economy is presented in Chapter VI. This definitely does <u>not</u> mean that discussion of the models in the present chapter has been a sterile exercise. Without having examined the models it would not be clear what to look for in the case study. Moreover, the value of models, and their study, is not determined by whether they accurately represent a particular case. Models are not the goals of research, but rather a source of questions.

CHAPTER III

THE TEST CASE

The Moundville Chiefdom

The Mississippian chiefdom centered at Moundville, Alabama, during the 11th to 16th centuries A.D., was chosen as a test case by reason of several properties rarely encountered in archaeological examples of chiefdoms. First, an unusually large body of data on the chiefdom already exists, both in the literature and in museums. Second, previous analyses of some portions of these data document the society's organization as a complex chiefdom, as well as many aspects of settlement pattern, culture history, economy, diet, etc. The third propitious factor is that as a prehistoric polity it has clear geographic boundaries, with archaeological components of the chiefdom clustered within 20 km of Moundville. Beyond this radius the area was largely unpopulated. This allows us to distinguish between components of the chiefdom and nearby polities which had some other political relation to this chiefdom. Finally, the center of one of the nearby polities has been extensively excavated and thoroughly reported. Since much of the extant information on the Moundville chiefdom is published in widely available sources, the following review will focus on the conclusions drawn by previous analyses rather than on details of data and analytic technique. Such details will be included, however, in the description of the new research that forms the core of this study.

Environmental Setting

Settlements of the Moundville chiefdom were located along a 40 km stretch of the floodplain of the Black Warrior River below Tuscaloosa, Alabama (see Fig. 3.1). Tuscaloosa is the location of the river's fall line, below which the river meanders in an alluvial valley 5–8 km wide. As Peebles (1978a:388–393, 1978b:43) has emphasized, this location provided members of the chiefdom with easy access to oak-chestnut and mixed mesophytic forests in the Cumberland Plateau and Tennessee Ridge and Valley physiographic provinces, prairies of the Black Belt, bottomland hardwoods of the floodplain itself, and the oak-pine forest of the Fall Line Hills (see Fig. 3.2). The floodplain forests surrounding settlements of the Moundville chiefdom were a rich and complex interdigitation of stands of bald cypress (Taxodium distichum) in permanently inundated soils, sweetgum (Liquidambar styraciflua), holly (Ilex sp.), and black gum (Nyssa sylvatica) in permanently wet soils, large tracts of oaks (Quercus sp.) in seasonally wet soils, and mixed hardwoods on natural levees and terrace edges (Scarry 1986). In conjunction with aquatic fauna of the river and its oxbow lakes, this rich floral assemblage and its fauna provide moderate to high densities of all major non-agricultural foodstuffs exploited by historic Indians of the Southeast (Swanton 1946:265–381).

The Black Warrior floodplain is also highly productive for agriculture, using either prehistoric or modern technology. The most fertile soils (under early twentieth century management practices—see Peebles 1978a:400–403) are loams, most of them easily tillable with aboriginal technology. The frost-free growing season exceeds 200 days 9 years out of 10 (Johnson 1981:77; Edwards et al. 1939:4). Precipitation during the growing season averages 8–12 cm per month, though during the summer rainfall is unpredictable in location, amount, intensity, and regularity. This variability can be buffered, however, by planting in a variety of soils and locations (cf. Chmurny 1973). This general description of the physical environment will be augmented in the chapters on exploitation of specific resources.

History of Research

The extensive field research in the Moundville area has been described in several publications (Peebles 1979, 1981; Bozeman 1982; Steponaitis 1983a, b), so this review focuses on the nature of the extant database, its strengths, and its weaknesses. The

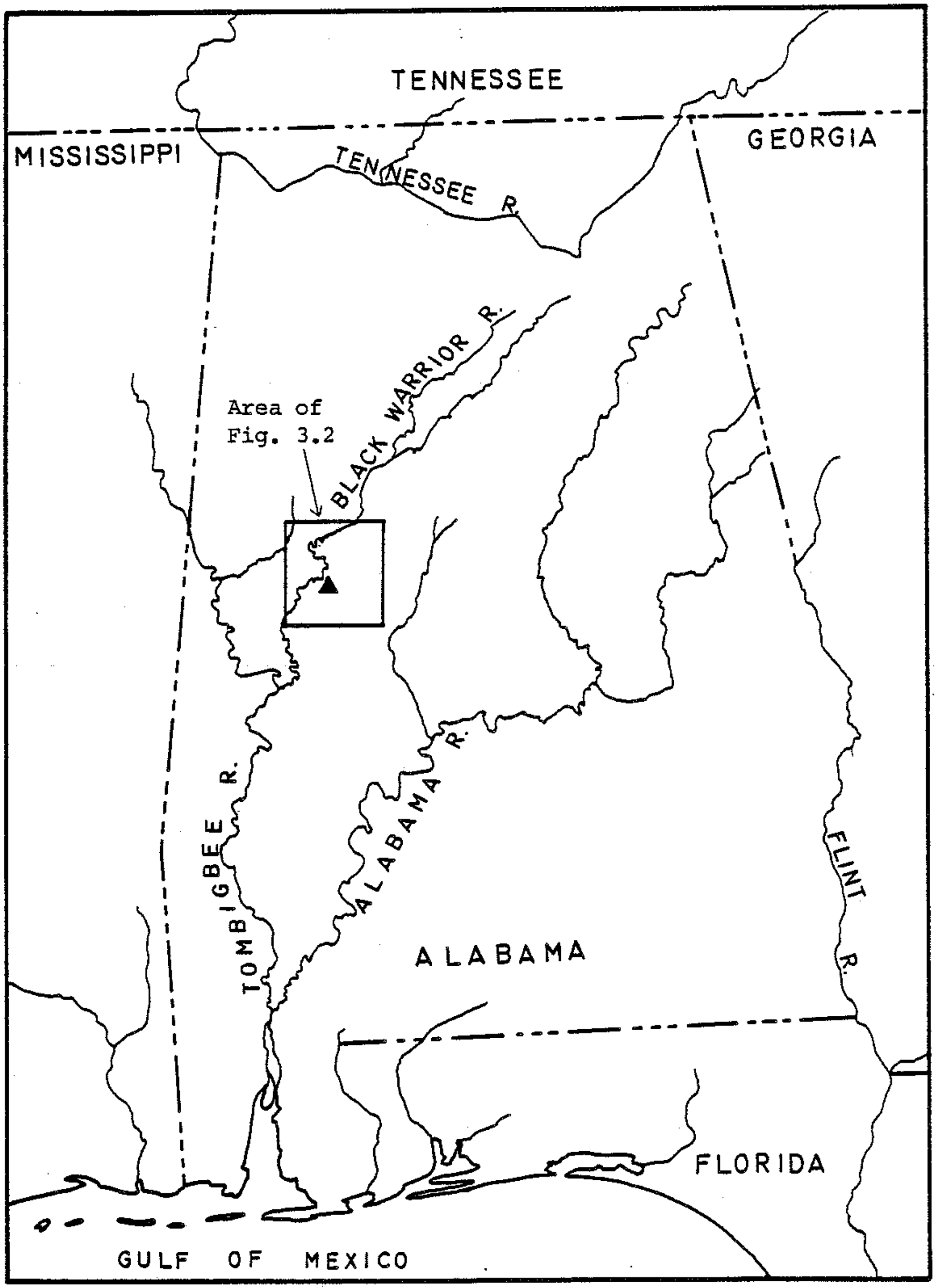
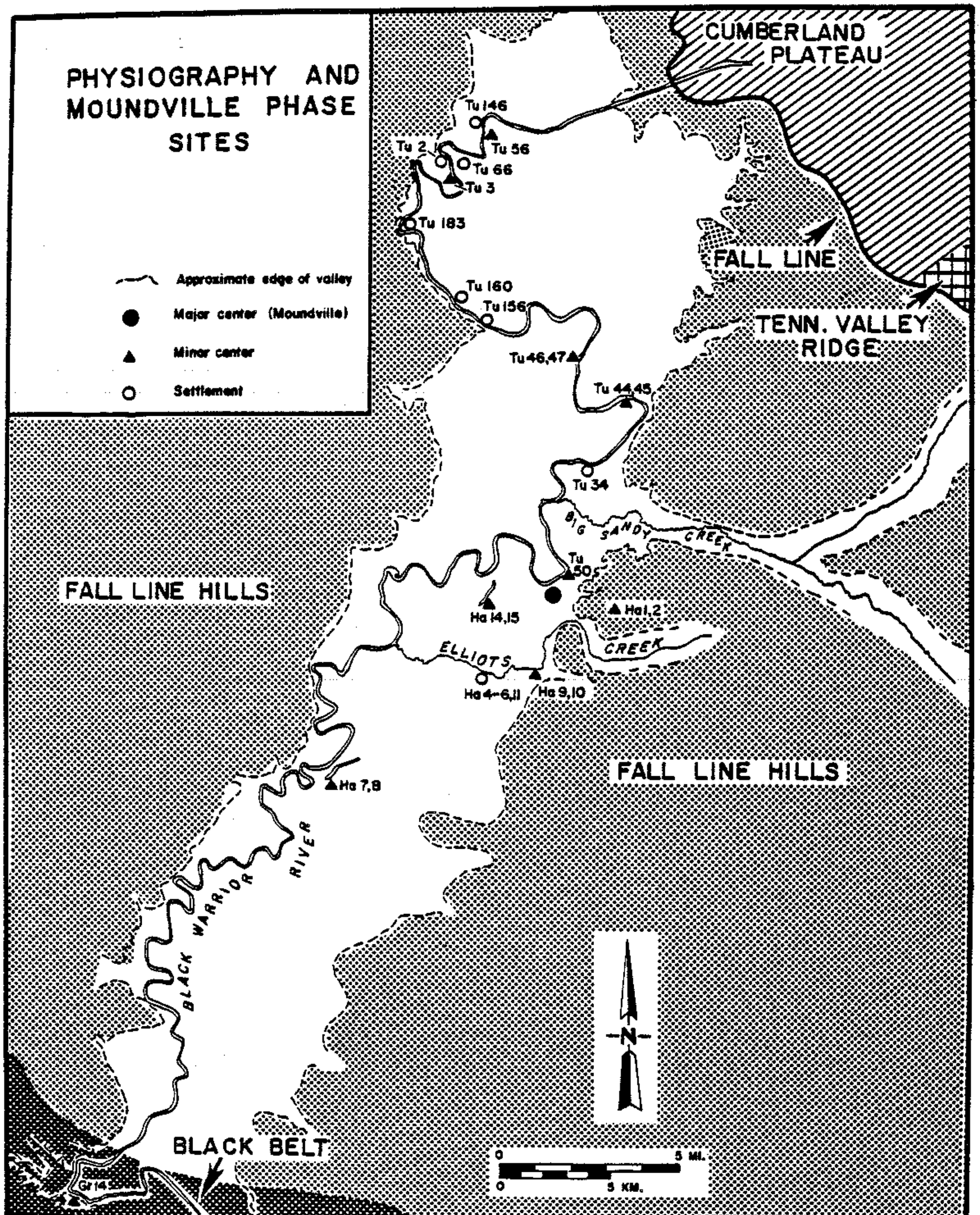


Figure 3.1

Location of the Moundville chiefdom



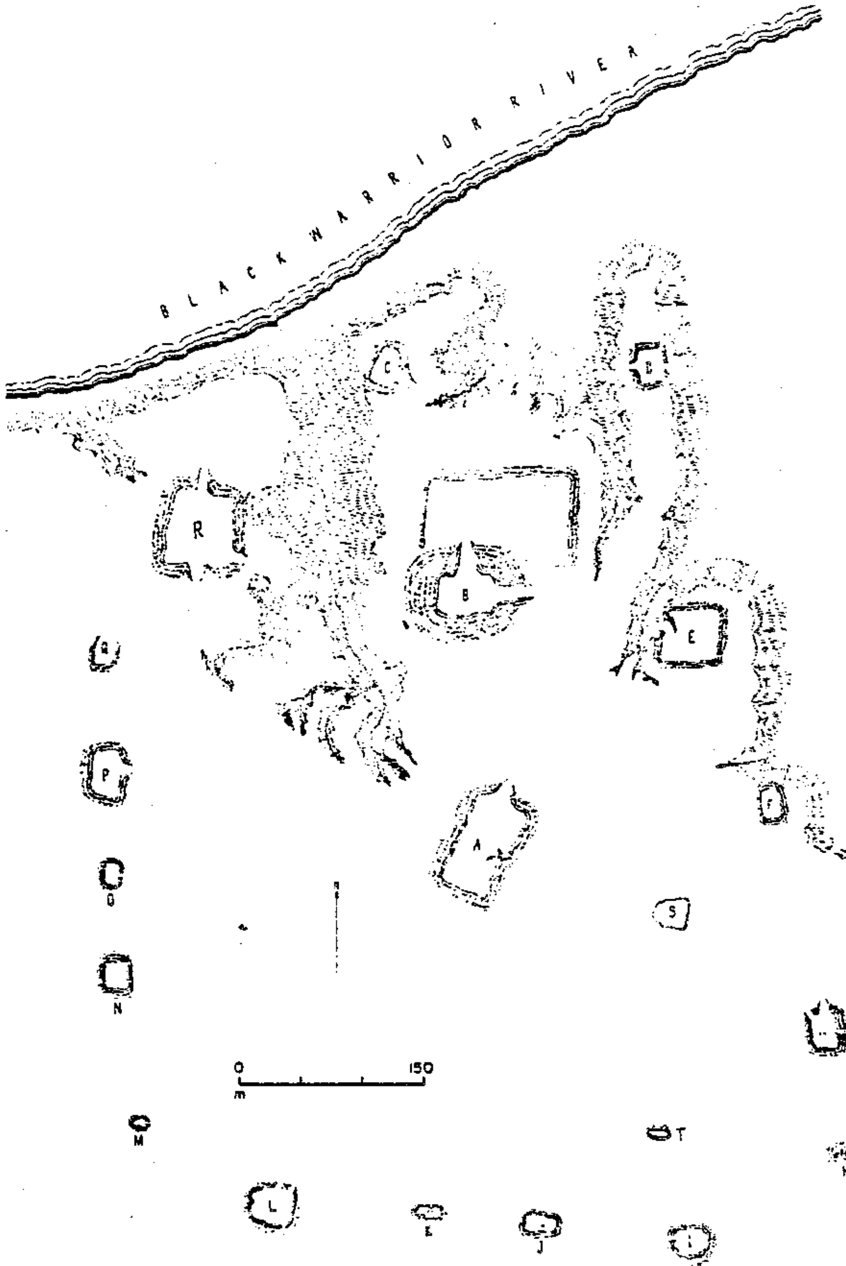
(Peebles 1978)

Figure 3.2

Physiography of the Moundville area

Moundville site itself (see Fig. 3.3) has been excavated sporadically for over 140 years (Peebles 1979, 1981; Steponaitis 1983a, b). The bulk of our information about Moundville comes from the efforts of C.B. Moore (1905, 1907) and D.L. DeJarnette (see Wimberly 1956; Peebles 1979). Moore attacked all of the visible mounds and large parts of the site's high status precincts. His reports and field notes almost exclusively provide information on mortuary associations. In contrast, DeJarnette's excavations focused on the non-mound area and provide information on non-mortuary aspects of the site. Excavations by DeJarnette and his successors at the University of Alabama have continued to the present, with the WPA labor crews of the 1930s being replaced in more recent times by field school students. These extensive excavations (roughly 5 ha) in general lacked tight stratigraphic control and, as sediments were rarely screened, artifact recovery was strongly biased toward complete, large, and unusual items.

The allure of the large, impressive Moundville site has not forestalled investigation of its environs. Moore (1905) tested half a dozen platform mounds on the Black Warrior floodplain between Tuscaloosa and Eutaw, Alabama, finding nothing to interest him. In the 1930s the Alabama Museum of Natural History began compiling an archaeological site file. In addition to visiting the known Warrior floodplain sites, the Alabama Museum also excavated cemetery areas at two single-mound sites near Moundville (DeJarnette and Peebles 1970; Jones and DeJarnette n.d.; DeJarnette, field notes on file at Mound State Monument). Aside from a few, very minor salvage expeditions and the excavation of some Protohistoric cemeteries not of concern here, the outlying sites received no further attention until the 1970s. At that time many of the floodplain sites were revisited and small surface collections taken (Nielsen et al. 1973). Subsequently, John Walthall directed the intensive survey of a 6 km^2 section of floodplain and valley margin as well as excavation of a small portion of a Late Woodland occupation (Walthall, field notes on file at Mound State Monument; Bozeman 1982:157–159). This was followed by controlled surface collections and mound stratigraphy testing as part of Christopher Peebles's



(Moore 1905)

Figure 3.3

The Moundville site

Moundville project (Bozeman 1982). Another section of the floodplain (4.45 km^2) was intensively surveyed by Lawrence Alexander (1982). Further, informal site surveys by both professional and avocational archaeologists have covered much of the remaining floodplain. In short, we have good survey coverage of the floodplain near Moundville, but few excavation data.

Current Status of Research at Moundville

Our current understanding of the Moundville chiefdom is largely the product of research conceived, directed, and executed by Christopher Peebles. It was he, in the late 1960s, who first attempted to organize the vast bulk of the excavation records from Moundville into a coherent account of the excavations and their results (see Peebles 1979; an earlier attempt by Douglas McKenzie [1964, 1965, 1966] was far less detailed). Having organized the excavation records, Peebles analyzed the Moundville mortuary program, demonstrating its conformity to the expectations for a complex chiefdom (Peebles 1971, 1972, 1974; Peebles and Kus 1977). This was followed by analyses of the location of settlements within the chiefdom by Peebles (1978a) and Steponaitis (1978). These locational analyses ultimately had to be re-done as a result of information from the next phase of Moundville research (Bozeman 1982).

As one result of Peebles's analyses of the extant archaeological data, several major gaps in the data became obvious. The most serious problem was the inability to make chronological distinctions within the temporal span of the Moundville chiefdom. This span was thought to be 300–400 years (A.D. 1100–1200 to 1500–1550 [Peebles 1978c:33]), which in retrospect is an underestimate. To resolve this problem Peebles proposed the construction of a ceramic chronology through seriation of vessels from gravelots, with the analysis to be performed by Vincas Steponaitis. Steponaitis's analysis (1980, 1983a) resulted in a tripartite division of the Moundville era—now seen as 500 years long—into Moundville I (A.D. 1050–1250), Moundville II (A.D. 1250–1400), and, not surprisingly, Moundville III (A.D. 1400–1550). Further, "early" and "late" distinctions were made within these phases. Stratigraphic and chronometric support for this chronology was provided by deep stratigraphic excavations at Moundville directed by Margaret Scarry.

Scarry's excavations at Moundville were the second focus of Peebles's research project. The excavations were designed to provide the first systematically collected subsistence remains, using both fine-mesh waterscreening and flotation (Scarry 1981a, b; Michals 1981). A secondary goal of the excavations was to provide stratigraphic and chronometric verification of Steponaitis's ceramic seriation. As a result of the nature of the deposits sampled, most of Scarry's excavation data come from the Moundville I phase. Further, her data come principally from an area at the north edge of the site which on grounds of the spatial symbolization of status at the site (Peebles 1974, 1979) might be presupposed to be a non-commoner precinct. Data from the excavations, discussed in Chapter V, bear out this latter point.

The third focus of Peebles's project was collection of information about the chronology and size of outlying settlements. This was accomplished by mapping, controlled surface collection, and mound stratigraphy test excavation. These data were analyzed by Tandy Bozeman (1982), resulting in considerable revision of our picture of the Moundville settlement system. Briefly, we can now trace the development of the Moundville settlement system from small Late Woodland (A.D. 850 or 900 to 1050) villages, to four early Moundville I simple chiefdoms centered on single-mound sites. These communities were integrated into a complex chiefdom centered at Moundville in late Moundville I times. From the end of Moundville I to late Moundville III, Moundville remained the paramount site, while the locations of the outlying single-mound centers shifted within stable districts. Additional districts, and single-mound centers, were added to the south end of the chiefdom. This development is shown in Figure 3.4. Throughout the Moundville I – late Moundville III span the single-mound sites served as foci for districts or neighborhoods of dispersed farmsteads and occasional hamlets, with only a small population resident at the single-mound sites. In late Moundville III, however, population began to nucleate at some single-mound sites. In the following Protohistoric phase (A.D. 1550–1700, sometimes referred to as Moundville IV) the population of the valley was grouped into a set of villages whose mortuary remains show no evidence of intra- or inter-village social ranking. By the beginning of this phase the Moundville site apparently had been abandoned, and the complex chiefdom evidently had disintegrated.

Peebles's Moundville research project had additional goals and collaborators other than those already mentioned (see Schoeninger and Peebles 1981; van der Leeuw 1981; Hardin 1981; Haddy and Hanson 1980; Powell 1984, 1985). Their results will be reviewed elsewhere in this report when they are germane to the present research. Data from Peebles's research project continue to yield new information. At the time of this writing, Margaret Scarry is completing a Ph.D. dissertation at the University of Michigan on the change of subsistence strategy from the Late Woodland to Moundville I; Melody Pope is analyzing lithic tools from the settlement survey and testing program for an M.A. thesis at SUNY-Binghamton; and Christopher Peebles has begun the task of re-analyzing the Moundville mortuary program in light of the newly available chronology. Even with all the new information, however, there remained several key questions which could not be answered with the extant archaeological data on the Moundville chiefdom. The most important of these, concerning the economic structure of the chiefdom, required excavation data from the outlying settlements. To acquire these data, I directed small-scale excavations in 1983 at the White site (1 Ha 7,8), one of the outlying single-mound sites.

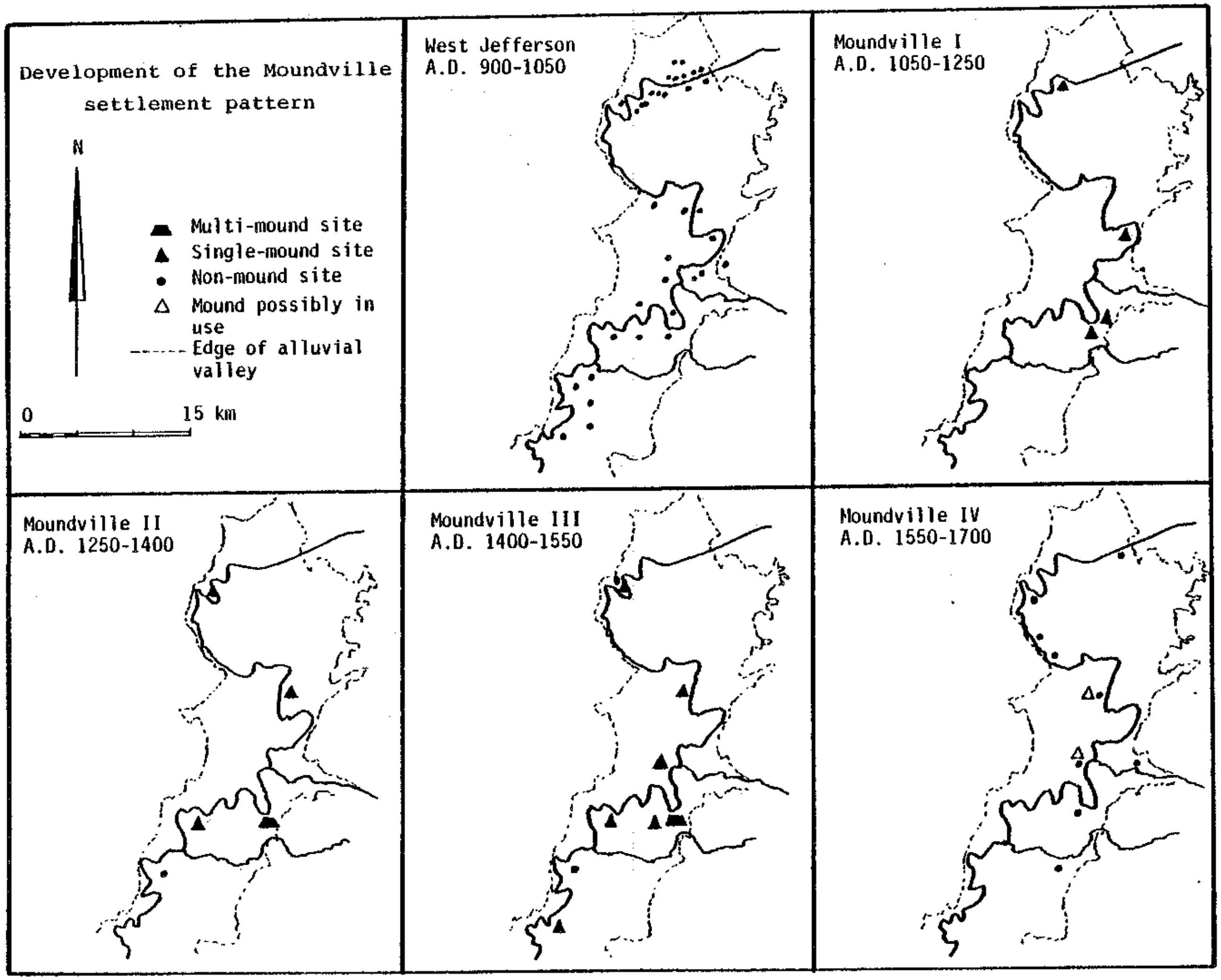
Previous Investigations at the White Site

There are 10 sites within 25 km of Moundville which have single-mounds known to date to the time of the Moundville chiefdom. There are additional extant mounds as well as historic references to other, now destroyed mounds, but the dates of these sites have not been established. Another single-mound site 35 km south of Moundville probably dates to this time as well, though its precise chronological and political relationships to the Moundville chiefdom are unknown. Effectively, then, there are ten single-mound sites

Figure 3.4

Development of the Moundville settlement pattern

Figure 3.4


Development of the Moundville
settlement pattern
N
Multi-mound site
Single-mound site
Non-mound site
Mound possibly in use
Edge of alluvial valley
0
15 km
West Jefferson
A.D. 900-1050
Moundville I
A.D. 1050-1250
Moundville II
A.D. 1250-1400
Moundville III
A.D. 1400-1550
Moundville IV
A.D. 1550-1700

thought to be subsidiary to the paramount center at Moundville. As depicted in Figure 3.4, from three to six of these subsidiary sites were occupied at any one time. Cemetery areas at two of the sites were excavated in the 1930s, but aside from extremely small-scale stratigraphic tests and an occasional salvaged burial, surface collections provided the only other artifactual data from these sites available by 1982. Since all of the subsidiary sites are positioned on landforms that were also occupied in the Late Woodland period, only those surface-collected artifacts chronologically restricted to the era of the Moundville chiefdom could be used in comparisons between components of the Moundville chiefdom. This effectively restricted between-site comparisons to ceramics. Obviously, further excavation was desirable for any investigation of the economic structure of the chiefdom.

The White site (1 Ha 7,8 in the Alabama state site file) was selected for further excavation. As is often the case with archaeological field decisions, selection of this site represented a compromise between advantages and disadvantages. The principal advantage of this site over the other subsidiary centers was that it is the only one which had not suffered deep plowing around the mound, hence it was the site most likely to retain unmixed and stratified deposits. The second advantage was that it is one of the two sites at which cemeteries were excavated in the 1930s, thus allowing me to focus on the residential and midden deposits. The two main disadvantages of the site were its heavy forest cover and the difficulty of getting to and from the site. Both of these disadvantages turned out to be more severe than anticipated, and caused considerable delays in both fieldwork and analysis. On the other hand, we located and excavated types of deposits that probably no longer exist at any of the other subsidiary sites.

The White site is located on a relict levee at the south end of an oxbow lake, 0.5 km from the present channel of the Black Warrior River (see Fig. 3.5). The oxbow lake is labelled as Martin Creek on the USGS Moundville West 7.5' topographic map, but was known as Big Heddleston Lake in the 1930s and is currently referred to locally as Whites Swamp. While no geomorphic data are available, the oxbow probably was not the active river channel at the time of mound construction and use. The lowest levee deposits contain fiber-tempered ceramics (1200–500 B.C. [Jenkins 1981:164]). Had the oxbow been the active river channel during the past 3000 years it is unlikely these deposits would have survived riverbank erosion and lateral migration. The levee deposit is fine sandy loam up to 50 cm thick, atop sandy clay which is strongly mottled with iron-manganese oxide staining. The levee may still be accumulating, since at least the lower portions of the site are flooded on a more or less annual basis. Such floods usually occur in January through April (nearly 80% of 198 floods recorded at Tuscaloosa from 1888 to 1960 [Peirce 1962:44–45]), though it was a late-May flood which washed out the access road to the site in 1983 and caused much of our difficulty in getting to the site that summer.

The site's susceptibility to flooding was also noted in the first published report of archaeological research at the site. Clarence B. Moore steamed up the Black Warrior River in the spring of 1905 and dug into the mounds at five of the Moundville chiefdom subsidiary sites, including the White site (Moore's "mound near Bohannon's Landing, Hale County"—Moore 1905:127, 243–244). He described evidence that spring flooding had covered the ground around the mound to a depth of eight feet (2.4 m). He went on to describe the dimensions of the mound and noted that, "considerable digging [on the mound summit] to a depth of from 4 to 5 feet yielded in one place fragments of a human skull" (Moore 1905:127). Moore's excavations into other mounds at the Moundville subsidiary sites were similarly unproductive. At the time of Moore's visit, the White site was in "a clearing... in high swamp, where is a deserted house, and, nearby, the mound with a small building upon it" (Moore 1905:127). The small building was to play a prominent role in the next recorded excavation at the site.

The next excavation came in the winter of 1930–31, when the site was visited by a field party of the Alabama Museum of Natural History (AMNH). The "party" consisted of Walter B. Jones, Director of the AMNH, and his assistant, David L. DeJarnette. Though Dr. Jones's devotion to the prehistory of the Moundville area cannot be doubted, it seems

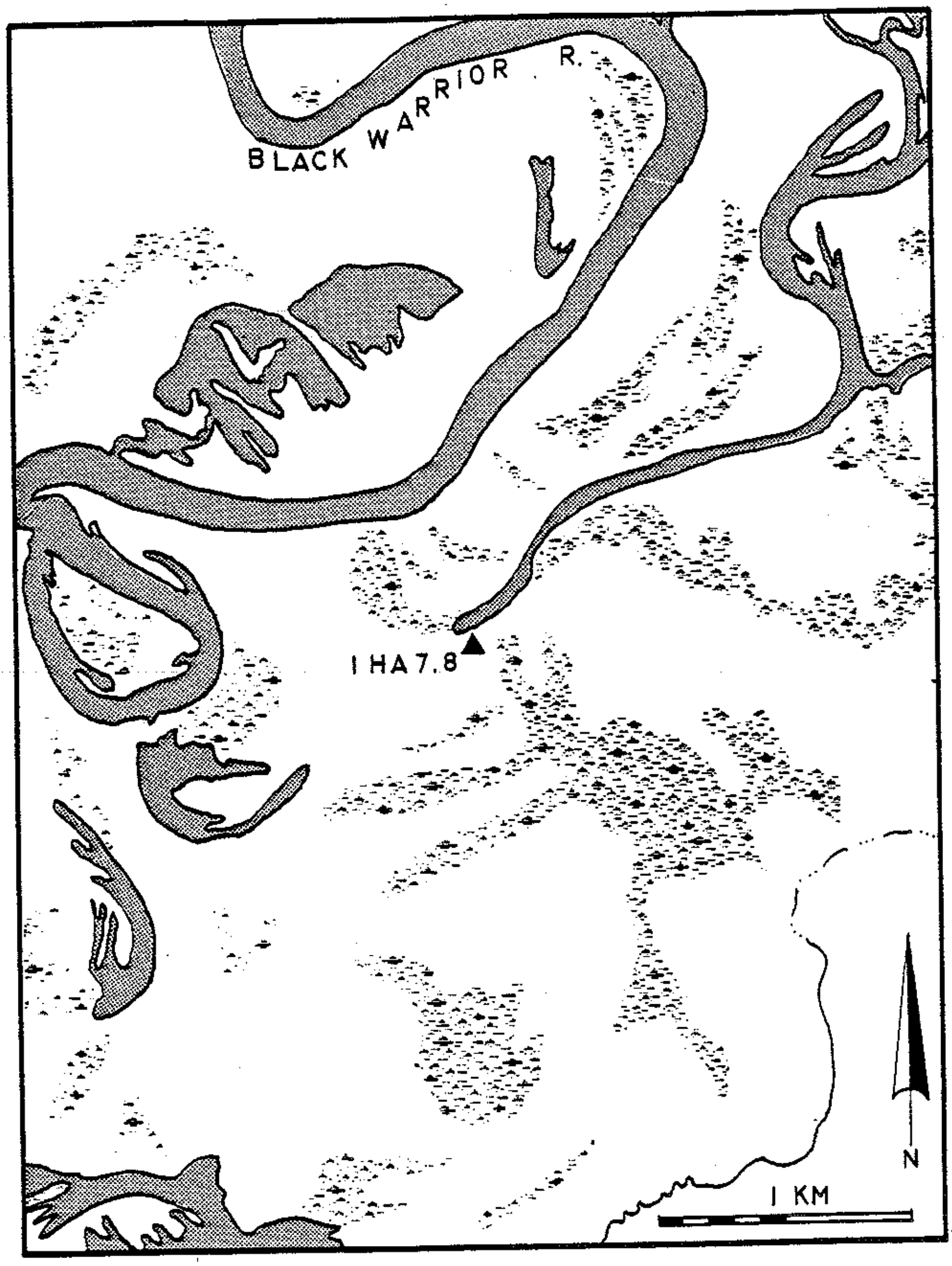


Figure 3.5

Location of the White site

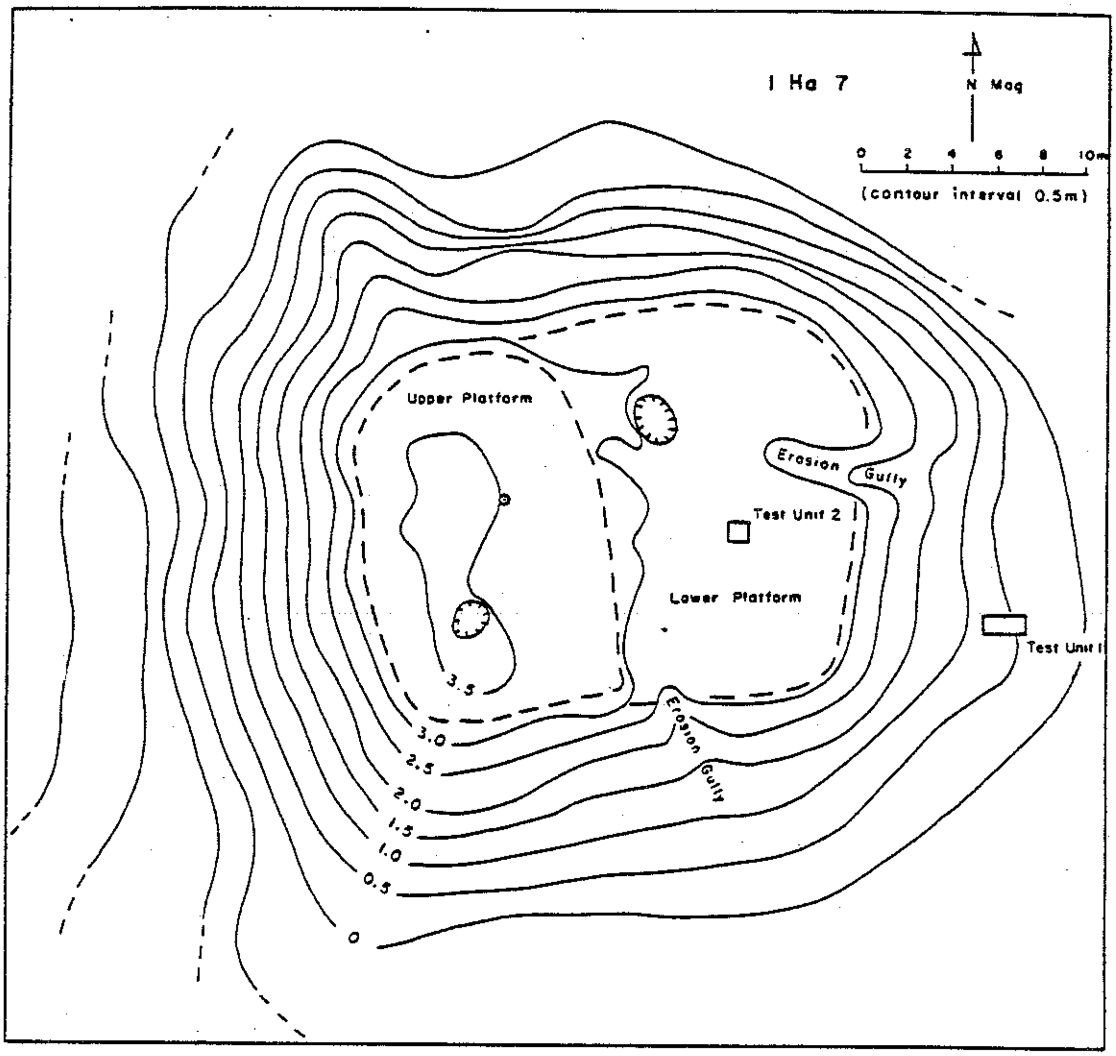
equally clear that he enjoyed duck hunting, for Jones rented the cabin on the mound and duck hunting rights from the landowner, J. H. White (James F. White, pers. comm. 1983). DeJarnette's enthusiasm for duck hunting, it seems, was outshone by his dedication to prehistory, for while Jones went hunting DeJarnette directed excavation in an area northeast of the mound (Tandy Bozeman, pers. comm.; James F. White, pers. comm.; unpublished notes on file, Mound State Monument). According to James F. White, son of the landowner and a child at the time, the excavation was prompted by the appearance of a burial eroding out of the large gully on the east side of the mound. The excavation eventually uncovered 29 burials.

Since this excavation took place before DeJarnette went to the University of Chicago field school where he learned more sophisticated recording techniques, record-keeping was limited to noting whether individual artifacts were associated with a burial, and if so, which one. No map of the excavations, nor drawings of the burials, were made, and the only surviving information about the location of the excavations is the remark that, "One small area about 25 ft. in diameter had skeletons with associated artifacts. Found other skeletons but nothing associated with them" (unpublished notes on file, Mound State Monument). The artifact inventory provides additional information about the burials, such as depth, orientation, and often an assessment of whether the individual was a child or adult. The mortuary remains are described in more detail later in this chapter, so it suffices here to observe that nearly all the artifacts in the inventory are still in the AMNH collections. The skeletal remains, however, either no longer exist in the AMNH collections or have been mislabelled and confused with other material.

It is not clear from the available documents whether the AMNH field party conducted excavations on the mound summit. If so, nothing was found. The mound today preserves evidence of several different excavations, probably Moore's 1905 work and several more recent excavations. No information about the more recent excavations was forthcoming from local residents.

The third recorded visit to the site by archaeologists came in the winter of 1972–73. Jerry Nielsen, John O'Hear, and Charles Moorehead of the University of Alabama relocated the site and collected a small sample of artifacts from the logging road which crosses the site, as well as digging an unspecified number of shovel tests to determine the depth of the artifact-bearing deposits (Nielsen et al. 1973:78–82). By describing the occupation around the mound as "a large village" they apparently recognized that the 40 x 80 ft (12.2 x 24.4 m) dimensions listed by the 1930–31 AMNH party were underestimates, but Nielsen et al. did not provide a size estimate of their own.

Except for casual visits by University of Alabama archaeologists, the next expedition to the White site was in August, 1979, when the site survey and testing crew of Christopher Peebles's University of Michigan Museum of Anthropology (UMMA) Moundville project mapped and tested the mound and attempted to define the site boundaries. The crew was under my direction. Three test units were excavated, two on the mound summit and one on the eastern flank of the mound. These excavations showed the mound to have been constructed in two episodes, with a series of superimposed, prepared sand floors atop the initial mound summit. This initial mound summit was 1.5–1.6 m above the surrounding ground surface. Though the plan and topography of the initial mound is not known, the second construction episode resulted in a rectangular mound 44 x 36 m at the base with the long axis very nearly east-west. The mound had a split-level summit, with the 16 x 20 m lower summit 2.7 m above the surrounding ground surface, and the 8 x 20 m upper summit 0.6 m higher. No evidence of structural remains on the mound summits were noted in the extremely limited 1979 test excavations. Had there been mound-top structures, most evidence of them is likely to have been obliterated by 400 years of forest growth and historic disturbance. There is also no visible surface indication of the former presence of the duck-hunting cabin which was on the upper summit. The mound topography and the location of the test units are shown in Figure 3.6.



(Bozeman 1982)

Figure 3.6 The White mound (1 Ha 7)

The 1979 UMMA field party also attempted to determine the location of the site boundaries. Since the site was heavily forested (and, more to the point, the end of the field season was only a few days away), the technique employed for this purpose was "quick and dirty". The south margin of the site was determined by judgmentally placed shovel tests, and this margin was followed around the site by further shovel testing. The locations of these shovel tests were not recorded, and the site boundary determined from them was mapped by pacing. Though no artifact collections were kept to document the point, the maximum extent of the site seemed to reflect the size and location of Late Woodland occupation(s), while the Mississippian occupation was of smaller though unknown size. The site size was estimated as 1.3 hectares.

Artifacts from the mound stratigraphic tests, as well as surface collections from around the mound, were analyzed by Bozeman (1982:246–261). Using Steponaitis's (1980) chronology of Moundville ceramics, Bozeman concluded that the White site was occupied, and both initial and final mound construction activities took place, in the Moundville III phase. The ceramics—8 whole vessels and 200 sherds—from the 1930–31 AMNH excavations supported this assessment, and indicated the presence of minor Moundville I and Protohistoric (Moundville IV) components.

The information about the White site available to me for planning the 1983 excavations can be summarized as follows. The site consisted of a Moundville III occupation smaller than 1.3 ha, overlying more extensive Late Woodland occupation(s). The single platform mound, constructed in two episodes, also dated to the Moundville III phase, as did most or all of the 29 burials excavated in 1930–31. The site was one of six similar Moundville III single-mound sites subsidiary to the multi-mound paramount center at Moundville.

1983 Excavations at the White Site

Excavation Procedures and Description

Excavation at the White site was conducted from mid-June to late August, 1983. It will come as no surprise to fellow archaeologists that the fieldwork actually performed differs from that which was proposed. The research proposal called for a 1% sample of the Moundville III phase occupation, using randomly located 2 x 2 m test excavations. This was to be followed by excavation of selected structures and features, assuming such were encountered. In actuality, far less area was excavated than had been proposed. Since the extent of the Moundville III component was far smaller than the site size estimated in 1979, the result is that the excavated area amounts to a 1% sample of the Moundville III occupation. A preliminary report (Welch 1983) of the excavation was presented at the Southeastern Archaeological Conference Annual Meeting in the fall of 1983.

The location of the 1983 excavations are shown in Figure 3.7, superimposed on a 0.5 m contour topographic map produced as part of the fieldwork. This map also shows the extent of modern disturbance associated with two access roads that cross the site. The road which runs from the south-southeast to the levee edge was the access road in the early part of this century—possibly the road by which C.B. Moore approached the site. It was replaced as early as the mid-1930s by the road which runs parallel to the levee (viz. Edwards et al. 1939). This road may have been constructed in the 1920s to facilitate logging on the east side of the road. Though the forest east of the road was clear-cut at that time, the timber west of the road was left standing to prevent erosion of the slough edge (James F. White, pers. comm. 1983). Figure 3.7 also shows the location of the 1979 UMMA mound test excavations and the approximate area of the 1930–31 AMNH burial excavations.

The first step of the fieldwork was the establishment of a site grid. A baseline roughly parallel to the levee edge was set out using transit and tapes. This grid-north baseline is 26° 45' east of magnetic north. The locations of all excavation units are

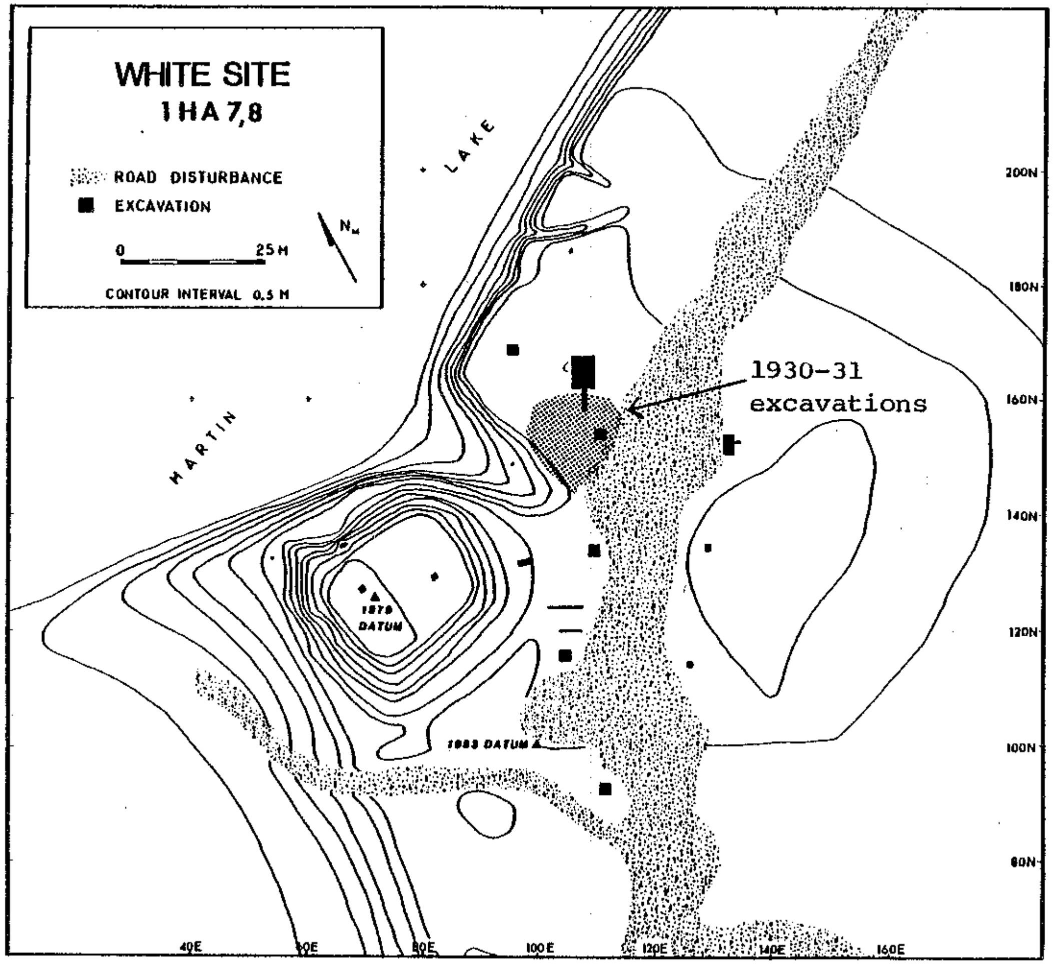


Figure 3.7

The 1983 UMMA excavations at the White site designated by the metric grid coordinates of the units' southwest corners. To simplify matters, the grid is labelled so that the entire site is northeast of the grid 0N/0E point. Wooden stakes were set at 20 m intervals on the 100E line (the grid north-south baseline) and on the 100N and 160N east-west grid lines. These stakes were set in with tapes and transit. Excavation units were located by taped distances from these stakes. In the rest of this chapter terms such as north or east refer to grid directions, not magnetic directions.

The research design called for waterscreening of all excavated deposit, using both coarse (1/4 in) and fine (1/16 in) mesh screens. Flotation samples were also to be taken from all excavation contexts. Excavation provenience was to be recorded at least to 2 x 2 m units, and excavation was to proceed by natural stratigraphy or arbitrary levels not to exceed 10 cm thick. One aspect of this design proved impractical in the field. The fine mesh waterscreen retained such large quantities of modern rootlets, mast, and leaf litter that it quickly became apparent that some revision of the sampling strategy was necessary. Thenceforth only one quarter (usually the southwest quad) of each level in the 2 x 2 m units was finescreened. The same or larger fraction was used for smaller units. None of the fine screen samples have been analyzed for this study, though of course all the material has been retained as part of the excavation collection.

One further point about laboratory processing should be made before proceeding. All of the artifact analysis in this study is based on material retained in 1/4 in screens. This includes the samples from the 1979 UMMA excavations. All the ceramics from the 1983 UMMA excavations were further screened through 1/2 in mesh and the resulting "sherdlets" were not further analyzed. Researchers in this region commonly use this procedure because very small sherds often cannot be classified reliably (e.g. Jenkins 1981; Mann 1983; Steponaitis 1983a). Appendix A contains a listing of artifact data from all excavated units.

Test excavation of the White site in 1983 began with excavation of one 2 x 2 m square in each 10 m block west of the logging road. These units were randomly selected (the exigencies of trees and road disturbance were accommodated by unbiased rules for relocation of unfeasible units). By the time the first three units (92N/110E, 115N/103E, 133N/108E) were finished, it was clear that excavation was proceeding more slowly than anticipated, but also that the area south of the mound had no evidence of Moundville III occupation. Attention was focused on the area west of the logging road and north of the mound. Two randomly selected 2 x 2 m units were opened (153N/109E, 168N/94E). In an effort to locate structural remains—house floors or wall trenches—a 10 x 0.5 m trench (158–166N/107E) was excavated across the highest part of this area. This trench revealed a Moundville III midden with good faunal preservation, overlying a partially intact structure floor. A 4 x 6 m block was opened to expose this floor.

Meanwhile, three 1 x 1 m units were excavated east of the road (114N/125E, 134N/128E, 153N/131E). The northernmost unit revealed a short section of a wall trench. Attempting to expose the presumed structure further, excavation at this location was expanded to a 2 x 4.5 m block. No further evidence of the presumed structure was seen. Unfortunately, this excavation proved to be very time-consuming. In retrospect, the effort spent to find a structure at this location would much better have been spent completing the series of 1 x 1 m test excavations east of the logging road. Because of the poor visibility in the undergrowth east of the road, it was only late in the season that the topographic mapping revealed this area to be higher than the area west of the road. It may thus have deeper archaeological deposits and a more complete sequence of occupation than the area west of the road. I consider the lack of adequate test excavation east of the road to be the principal deficiency of the 1983 fieldwork.

Two small (50 x 50 cm) stratigraphic tests were opened to check for possible stratified midden deposits on the slope leading to the slough. In most places this slope is too steep for debris to accumulate. Accumulation would be possible, however, in the large gully on the north edge of the mound and on the gently sloping ground west of the mound.

In both cases the tests contained sparse artifacts near the surface but were otherwise sterile.

Two additional test trenches, each 50 cm wide, were excavated near the eastern corner of the mound (120N/103–105E and 124N/101–105E). These trenches were an attempt to trace the path of a wide (> 1 m) feature which extended northeast-southwest across unit 115N/103E. This feature appeared to be a filled-in ditch extending 40 cm into the sterile clay subsoil. Though the feature extended across the 120N test trench, the situation in the 124N test trench is far from clear. The western end of the 124N test trench intersected a probable sunken house floor bounded by a wall trench. Though this structure probably pre-dates the mound construction, its age is otherwise unknown. The large ditch was not visible. Whether it turned or stopped between the 120N and 124N test trenches is not known. Neither is it clear what the function of the trench was. Conceivably it is a foundation trench for a palisade around the mound, but it is unusually wide compared to the palisade wall trenches at Moundville (J. Allan 1982, pers. comm. 1983). A section of the trench was excavated, and of the 50 sherds recovered from the fill, 5 (10%) were shell tempered. This suggests that the feature is of Mississippian date, but more specific information about its age or function is not available.

No excavation of the mound was attempted in the 1983 season. It was felt that the current mound summit would yield no structural data and that artifacts near the surface could not reliably be attributed to fill versus floor contexts. Removal of 1.1–1.7 m of overburden to reveal the earlier mound summit was simply not feasible for a small crew with limited time. Excavation of the mound would also require removal of the trees on it, some of which are nearly one meter in diameter.

History of Occupation at the White Site

Despite the incompleteness of the systematic testing program east of the logging road, the 1983 fieldwork provides considerable information about the history of occupation at the site. In addition to minor occupations of nearly all periods from ca. 1000 B.C. (a few fiber-tempered sherds were recovered) through A.D. 800, there was a large Late Woodland occupation(s) of the West Jefferson phase (A.D. 850 or 900 to 1050). The location was then unoccupied, or mostly unoccupied, for roughly 400 years. Of the more than 20,000 shell-tempered sherds recovered from the site, roughly 20 (0.1%) display modes which occur no later than late Moundville II. Occasional farmsteads or perhaps small extractive camps would account for these rare Moundville I and II diagnostics. The site became a focus for occupation again in the Moundville III phase. Since the precise chronology of this occupation bears on the relevance of the excavation data to the issues examined in this thesis, the chronological information is discussed below in rather tedious detail.

It is not clear exactly when in the Moundville III period this occupation began. The uncertainty stems from a variety of sampling and preservation problems. First, if the initial occupation in the Moundville III phase had been located on the high ground east of the present logging road, the 1983 sampling program would have missed it. Second, the most characteristic ceramic diagnostics for the periods preceding late Moundville III are fine-line incised (so-called "engraved") motifs executed on burnished, fine shell-tempered vessels. Except in the late Moundville III midden with its relatively good shell preservation, fine-shell tempered sherds at the White site tend to have weathered surfaces. This means that the apparent rarity of sherds diagnostically prior to late Moundville III might be due to their differential destruction.

The third source of uncertainty in dating the reoccupation of the site is the possibility that the remains of this occupation may have been removed. Though there is no evidence of such removal by natural agencies, the first stage of the mound was constructed of artifact-bearing, dark, humic silt. This sediment appears to have been part of the sheet midden covering the site. I suspect the fill for the first mound stage came from the area south and east of the mound, on the basis of the low elevation and relatively low percentage of shell-tempered ceramics in this area (16% in Level 1, 92N/110E; 0% in

Level 1, 115N/103E; 55% in Level 1, 133N/108E; 0% in Level 1, 114N/125E). The ceramics in the first mound fill are consistent with this interpretation. Test Unit 2 of the 1979 excavations penetrated 1 m into the first mound stage, recovering 681 sherds of which 34% are shell-tempered (see Table 3.1). Only three of the shell-tempered sherds were decorated wares useful for dating within the Moundville era. Two of these sherds have the fine-line incising which is notably rare in the off-mound test units and which is most common prior to late Moundville III.

Table 3.1

Ceramics from the lower mound fill, 1 Ha 7[1]

Type and variety	Rim sherds		Body sherds	
	N	%	N	%
Sand tempered				
Baldwin Plain var. Blubber	0	0	2	0.3
Unclassified	0	0	1	0.1
Grog tempered				
Baytown Plain var. Roper	10	47.6	409	62.0
Mulberry Creek Cordmarked var. Aliceville	1	4.8	26	3.9
Wheeler Check Stamped var. Sipsey	0	0	1	0.1
Shell tempered				
Mississippi Plain var. Warrior	10	47.6	214	32.4
Bell Plain var. Hale	0	0	4	0.6
Carthage Incised var. Carthage	0	0	1	0.1
Moundville Engraved var. unspec.	0	0	2	0.3

[1] From Bozeman (1982:258–259 and pers. comm.)

The clearest indication of occupation at the site prior to late Moundville III comes from the 1930–31 AMNH burial excavations. Of the 29 burials excavated, 3 included ceramic vessels (see Table 3.2). Burial 2 was accompanied by a Bell Plain var. Hale restricted bowl with widely spaced nodes. In Steponaitis's seriation of gravelots at

Moundville, widely spaced nodes on bowls is a mode restricted to late Moundville II and early Moundville III. There are two reasons to be cautious in interpreting this information. In the first place, the date of a burial does not necessarily indicate the date of the site occupation and construction activities. Secondly, a seriation is an approximation to a chronological ordering, and it would be a mistake to place too great reliance on the prospective fit of one item from the White site to a seriation of items from Moundville. Overall, however, the ceramics from the first mound stage and from Burial 2 indicate that the White site may have been reoccupied during the early Moundville III phase.

Table 3.2

White site burials with associated vessels[1]

Burial No	Vessel No	Vessel description
Burial 2	Wh 2	Bell Plain var. Hale restricted bowl with 4 small pinched nodes at inflection point, 14 cm diam. x 7 cm high
Burial 16	Wh 53	Mississippi Plain var. Warrior subglobular jar with 20 handles, red paint on interior of rim, 14 cm diam. x 11 cm high
	Wh54	Alabama River Incised water bottle, unburnished. Wet paste, sloppily incised 3-line running scroll. 11 cm diam. x 8 cm high
Burial 28	Wh 58	Bell Plain var. Hale beaded rim hemispherical bowl, 13 cm diam. x 8 cm high

[1] From unpublished notes on file, Mound State Monument

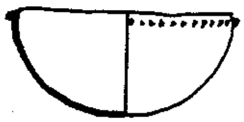
Most of the occupation at the site, however, dates to the later part of the Moundville III phase. The ceramic diagnostics from the site include beaded rims on bowls, flaring rim bowls (both shallow and deep), standard jars with 8 or more handles, red and white painted pottery, incised hand and eye designs, and Carthage Incised var. Carthage (see

Fig. 3.8). This list nearly duplicates the upper end of Steponaitis's seriation of pottery from Moundville (Steponaitis 1983a:Fig. 26). Burnished subglobular bottles, and the type Moundville Engraved, are almost absent from the site. The late Moundville III ceramic assemblage was present in every excavation unit north of the 130N grid line, though, with an exception described below, every excavation level also contained at least 10% admixture of Late Woodland ceramics. Arguments are presented above that some part of the area south of the 130N grid line may also have been occupied during part of the Moundville III phase.

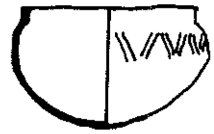
Taking this possibility into account, a maximum size for the late Moundville III component can be calculated (see Fig. 3.9). Though the extent of the component east of the logging road is not definitely known, occupation on land below the 0.0 m contour of Figure 3.9 is highly unlikely, as soil below this contour is very poorly drained. Using the 0.0 m contour as the effective site boundary, the site is 0.74 ha as measured by compensating polar planimeter on the original 1:400 scale contour map. This estimate includes the area of the mound (0.17 ha). Excluding the mound, the occupation area amounts to 0.57 hectares.

The sampling fraction attained by the 1983 excavations can be calculated using this site size estimate. Within the estimated site boundary 55.5 m^2 were excavated. This is just under 1% of the off-mound occupation area. It is also worth noting that the area disturbed by the logging road is 0.13 ha, or 23% of the site.

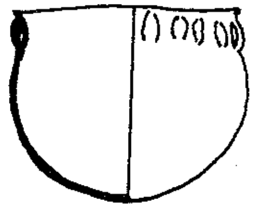
The spatial organization of the late Moundville III community at the White site cannot be determined with the present data. That is, the number, nature, and distribution of structures are not known. Clearly, the structure(s) atop the mound was symbolically and presumably functionally distinct from those elsewhere at the site. It is also clear from the 1930–31 AMNH excavations that an area near the northeast flank of the mound was a cemetery area. The area southeast of the mound, from which the first mound fill may have come, has very sparse late Moundville III ceramics and therefore may have been a



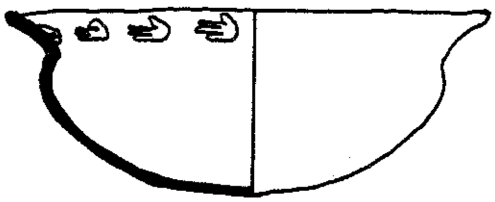
Bell Plain var.
Hale or Big Sandy
beaded rim bowl



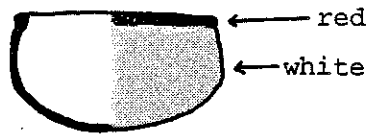
Carthage Incised
var. Moon Lake
short-neck bowl



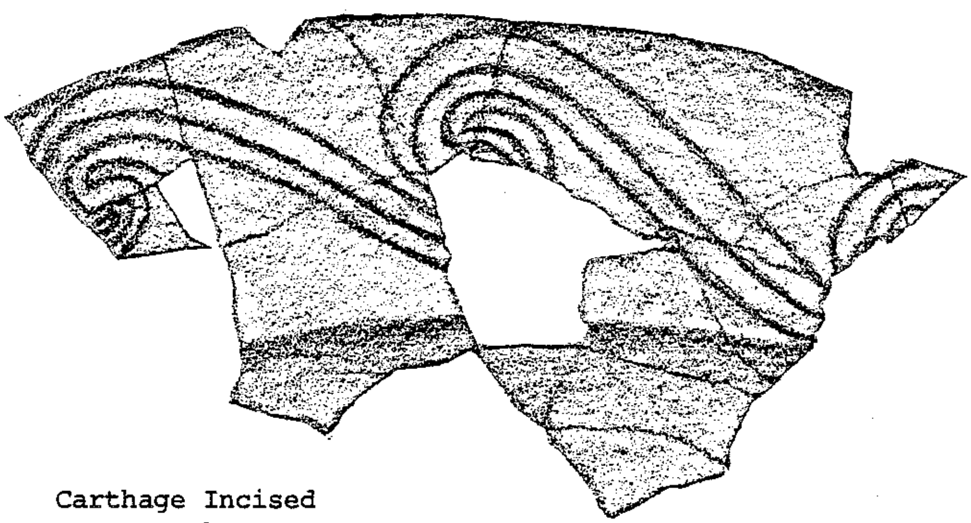
Mississippi Plain
var. Warrior
standard jar
8+ handles



Carthage Incised
var. Fosters
flaring rim bowl



Unclassified
red and white painted
short-neck bowl



Carthage Incised
var. Carthage
rim of flaring rim bowl

Figure 3.8 Ceramic modes from the White site

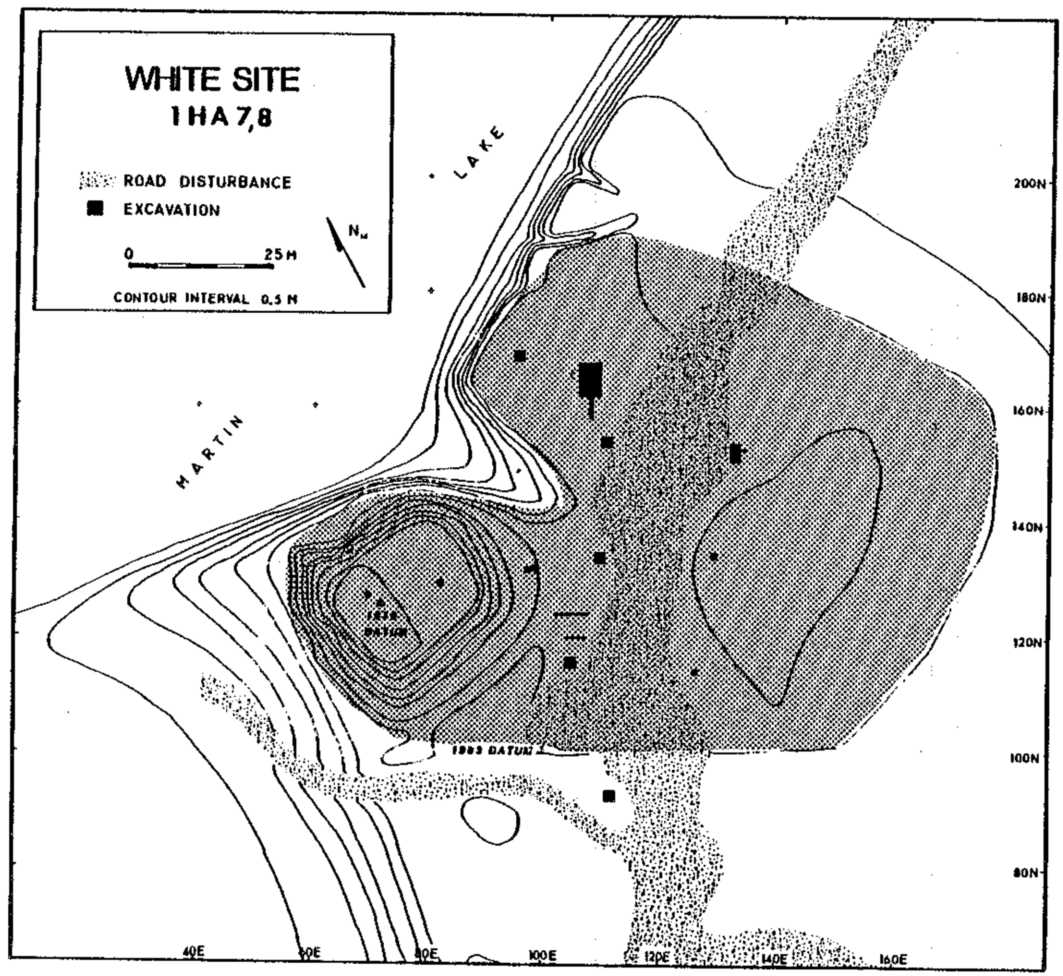


Figure 3.9

Maximum extent of late Moundville III
occupation at White

plaza area. Since this argument relies on negative evidence little faith should be attached to it. Further, there is no visible ramp leading from this possible plaza to the mound summit. In fact, the only ramp-like feature of the mound descends from the northwest corner of the mound towards the slough edge (see Fig. 3.5). This is diagonally opposite the cemetery area and the zone of sheet midden which probably indicates the residential area.

Within the residential zone, one small area is quantitatively, if not qualitatively, distinct. This is the low rise around 166N/105E. This rise is an accumulation of late Moundville III midden roughly 20 cm thick. A 4 x 6 m block of this deposit was excavated. The largely unmixed late Moundville III midden blankets a mixed Moundville/ Late Woodland midden such as found elsewhere on the site. The density of artifacts in the late Moundville III midden (up to 7800 sherds/m^3) is twice that found elsewhere at the site. It is the only area of the site with identifiable faunal remains. The late Moundville III midden also contains items rare or absent elsewhere at the site, e.g. fragments of greenstone celts, fragments of notched sandstone discs (such as the "paint palettes" found at Moundville, see Webb and DeJarnette 1942:287–291), and pieces of galena. Immediately underlying the midden in the excavation block is a fragmentary structure floor. Badly disturbed by 400 years of tree roots and rodent burrows, the floor is present only in patches. Where present, these patches have piles of sherds lying flat atop the floor. These are secondary refuse deposits, not collapsed, in situ vessels. On the basis of the density of cultural debris and the character of the artifacts lying on the floor, the late Moundville III midden is interpreted as an intentional refuse deposit rather than the chance accumulation of debris seen elsewhere at the site.

The White site was abandoned at the end of the Moundville III phase or very early in the Protohistoric era. Three sherds of Alabama River Applique and one of Alabama River Incised (Sheldon 1974:203–206 [or Mississippi River Plain var. Hull Lake with applied handles, and Barton Incised var. Big Prairie in the scheme of Curren 1982]), and one Alabama River Incised (or Barton Incised var. Big Prairie) vessel found with Burial 16 are the only Protohistoric diagnostics recovered from the AMNH and UMMA excavations. This indicates the White site was abandoned at very nearly the same time that Moundville itself ceased to be occupied. Steponaitis (1983a:126) estimated this date at roughly A.D. 1550. This estimate is corroborated by material from the 1983 UMMA excavations.

Four absolute dates were obtained from the area of the refuse deposit (see Tables 3.3 and 3.4). A radiocarbon date from a smudge pit stratigraphically below the structure floor yielded an uncalibrated, $^{13}C/^{12}C$-corrected estimate of a.d. 1320 $\pm$ 50. This date is considered acceptable for the ceramic associations. A radiocarbon determination was made on wood charcoal loose in the refuse deposit. The sample was drawn from 10–20 cm below ground surface in the excavation unit in which the underlying structure floor was most intact. The uncorrected date is a.d. 1550 $\pm$ 50. Using the calibration tables of Klein et al. (1982), the midpoint of the 95% confidence interval for the true date is around A.D. 1515. Two sherds from the same excavation context were dated by thermoluminescence, with the background radiation dose rate calibrated from an associated sediment sample. A late Moundville III diagnostic short-neck bowl rim was dated at A.D. 1530 $\pm$ 40. The other sherd was a piece of the Carthage Incised var. Carthage rim illustrated in Figure 3.8 (the illustrated rim is composed of 15 sherds all recovered from this excavation level). The estimated date is A.D. 1520 $\pm$ 50.

These three dates on late Moundville III material are the first acceptable absolute dates acquired for this phase (an A.D. 1840 $\pm$ 50 date from Moundville is obviously inaccurate—Steponaitis 1983a:126; M. Scarry, pers. comm. 1986). They accord well with the mid-sixteenth and seventeenth century dates for the ensuing Protohistoric period (e.g., Curren 1982:109, 1984:89–193). Since the dated material comes from the later part of the Moundville III phase, and from near to the end of the White site occupation, these dates indicate that occupation at both the White site and Moundville ceased very close to A.D. 1540, the year de Soto's army passed across western Alabama.

Table 3.3

Radiocarbon dates from the White site

Lab no.	Sample description	Years B.P. 5568 half-life	$^{13}C/^{12}C$ (0/00)	$^{13}C/^{12}C$ adjusted years B.P.	Adjusted years B.P. 5730 half-life	Calibrated date A.D.[1] (95% confidence interval)
Beta 9952	Pine and oak charcoal, possibly with some maize; Fea. 56 (162N/105E); Mdvl II/III	670±50	- 27.38	630±50	650±50	1260-1405 (midpoint=1335)
Beta 9951	Pine and hardwood charcoal; 164N/105E L.2; late Mdvl III	400±50	-	-	410±50	1405-1620 (midpoint=1515)

[1] Klein et al. (1982) calibration

Table 3.4

Thermoluminescence dates from the White site

Lab no.	Sample description	Years B.P.	Date A.D.
Alpha 1231	Carthage Incised var. Carthage rim sherd; 164N/105E L.2; late Mdvl III	430±50	1520±50
Alpha 1232	Bell Plain var. Hale short-neck bowl rim sherd; 164N/105E L.2; late Mdvl III	420±40	1530±40

Data Used in the Analysis

For data from the Moundville chiefdom to be useful in evaluating the alternative models of chiefdom economic structure, the data available in 1982 needed to be supplemented with excavated material from one of the subsidiary centers. In this chapter I have described the White site excavations, but I have not yet specifically addressed the issue of whether the excavations produced data with the qualities necessary for my purposes. The excavations did produce data with the necessary qualities, but not all of the excavations were successful in this sense. The primary quality desired of the data is that they not be chronologically mixed. Mixed Late Woodland and Moundville deposits, after all, would not be significantly more useful than the published, similarly mixed, surface collection data from other sites. Mixed ceramics, of course, can be sorted out by component, but the lithic, faunal, and botanical data cannot. Only one area of the White site yielded unmixed Moundville-era deposits—the late Moundville III refuse deposit around 164N/107E. With few exceptions the White site data used in this dissertation come from the 4 x 6 m excavation of this refuse deposit. Since so much reliance is placed on these data, it is necessary to clarify as much as possible what this deposit represents in terms of the White site community and the chiefdom as a whole.

It is not possible to specify which households within the community deposited refuse in this location. In part this stems from the near absence of identifiable structures in the excavations. Even if preserved floors and wall trench patterns had been encountered, it is still not likely that the origin of the refuse could be determined.

Though we cannot specify where the refuse came from physically, the material itself contains some indications of where it came from in sociological terms. That is, we can determine what kind of households contributed to the refuse deposit. From the distribution of items in graves at Moundville, and the location of the graves within that site, we know that certain items and raw materials were restricted to the (ascriptive) upper stratum of Moundville society. Among these were stone discs ("paint palettes") and galena cubes

(Peebles 1974; Peebles and Kus 1977:439). Two pieces of galena and at least one fragment of a notched sandstone disc were included in the late Moundville III refuse deposit at the White site. Neither kind of artifact was encountered elsewhere at the site. This suggests that the household(s) of the local elite contributed to the refuse deposit.

Households of lower status probably also deposited refuse at this location. If only the elite household(s) were piling trash in this area, it is likely that the ratio of serving and storage vessels to cooking vessels would be higher than the ratio elsewhere at the site. This implication follows from the well-known obligation of hospitality on the part of chiefs or people of high rank (Sahlins 1972: 268, 270). This obligation would lead to a "different balance of functions performed in households of varying statuses" (Drennan 1975:135). Whalen (1976:117) and Drennan (1975:135), for example, showed that the serving:cooking ratios were higher in debris from high-status households than from low-status households in Formative villages in Oaxaca. The ratio of serving to cooking wares in the White site refuse deposit is slightly lower than the ratio elsewhere at the site, as shown in Table 3.5 (excavation units with combined sample sizes below 50 are discounted here, due to the potentially high sampling error). On this basis it seems that elite household(s) were not the only, nor even necessarily the major producers of the refuse. Though spatially only a small part of the site, the refuse deposit is a sample of the refuse from a broad (though perhaps not complete) portion of the community.

In order for the refuse data to be relevant to questions about the economic structure of a complex chiefdom, the data must be shown to date to a time when the Moundville system was still functioning as a complex chiefdom. This is an obvious point, but the data are from a time so close to the disintegration of the Moundville chiefdom that the point is far from trivial. There are two avenues along which this issue may be approached: comparison of late Moundville III burials at Moundville and at White, and comparison of the extent of occupation at the two sites. The latter avenue will be travelled first.

Table 3.5

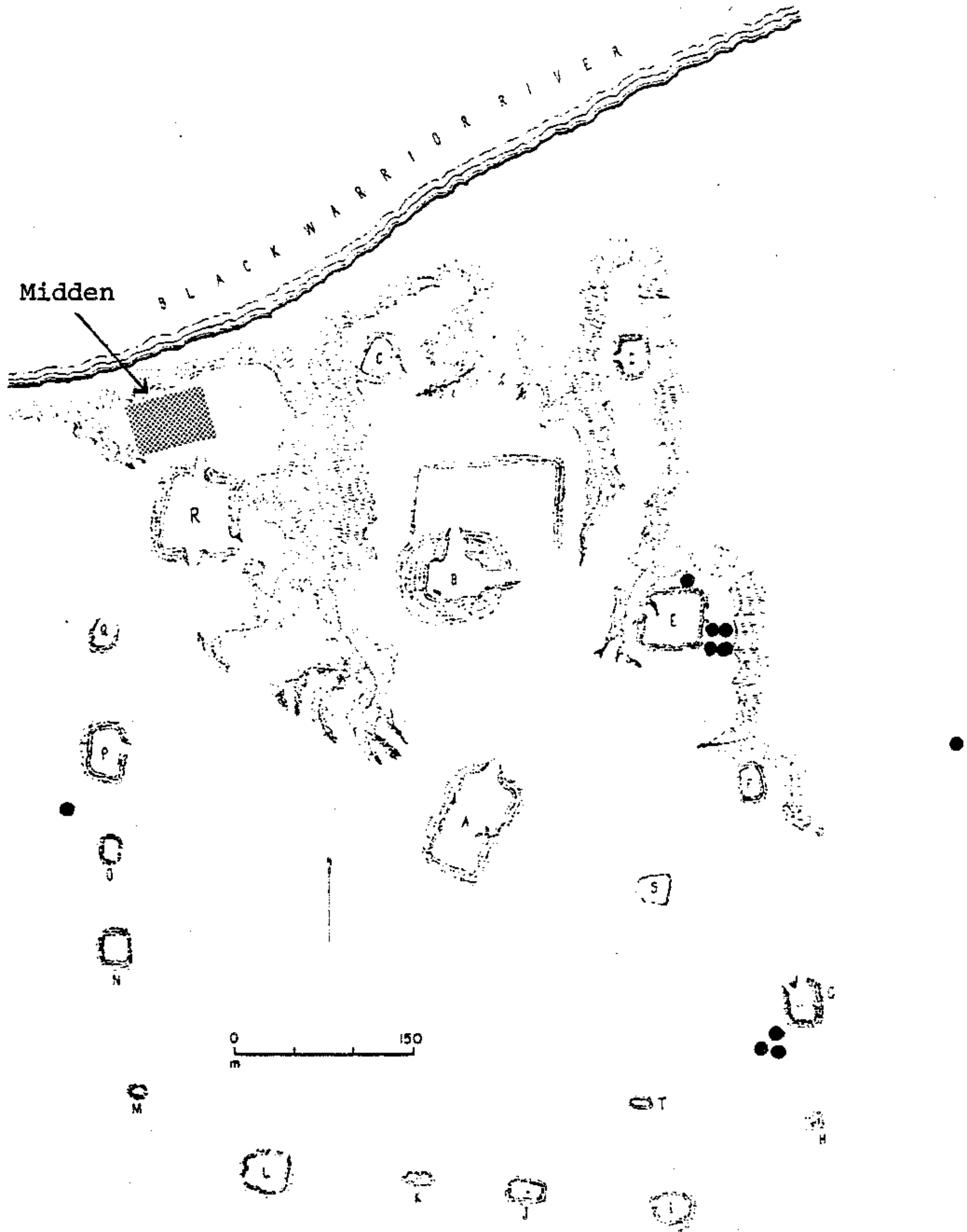
Ratios of cooking to serving wares by excavation unit

Excavation unit	No. of Miss. Plain sherds (cooking ware)	No. of burnished or painted sherds (serving ware)	Serving:cooking ratio
Refuse deposit	13619	3304	.24
168N/94E[1]	78	17	22
153N/109E[2]	404	109	.27
East block[3]	1330	373	.28
134N/128E	70	22	.31
133N/108E	27	4	.15
Other units[4]	16	0	0

1 Includes only material from Level 1 (0–10 cm b.s.); additional material below this level cannot be reliably sorted due to erosion and incrustation of surfaces.
2 Only levels 1–4 included; other levels are fill in modern trench.
3 Comprises contiguous units in the northernmost excavations east of the roadway.
4 Comprises units south of 135N west of the roadway.

The very incomplete available information on the extent of late Moundville III occupation at Moundville indicates that this occupation was both qualitatively and quantitatively different from that at White. Since the vast corpus of artifacts excavated at Moundville has not been re-analyzed in light of Steponaitis's ceramic chronology, this conclusion is tentative. Nevertheless, we know that there is late Moundville III midden north of Mound R (Steponaitis 1983a:90), and that there were late Moundville III burials at several locations around the plaza (see Fig. 3.10). This suggests that in late Moundville III times Moundville had a large population living around the very large central plaza.

Eighteen burials at Moundville, including 27 individuals, contain vessels diagnostic of the late Moundville III phase (Steponaitis 1983a:Table 35; Peebles 1979). Table 3.6 presents summary information about these burials. In contrast, only 2 burials at White included late Moundville III diagnostic vessels (see Table 3.7). Since a larger fraction of Moundville has been excavated than of White—5% (Peebles 1978a:375) versus roughly 2%



Each ● is one burial

Figure 3.10

Location of late Moundville III material at Moundville

(55 m^2 in 1983 plus an estimated 50 m^2 in 1930–31)—the comparison should be adjusted accordingly. (The site information form filled out by either Jones or DeJarnette for the White site in the 1930s has a comment after the heading 'Possibility of further excavation': "We thought we had it all" [unpublished document on file, Mound State Monument].) If we further assume that all 29 individuals at White were buried in the late Moundville III phase, this figure is still small relative to the number of burials at Moundville which might date to the same time: of those burials which included vessels, roughly 370 may date as late as late Moundville III, and there are 1256 burials with no vessels and hence no assigned date (Steponaitis 1983a:Table 35; Peebles 1979). If these 1600+ undated burials have the same date distribution as the 95 burials with definite dates, roughly 20% (or 320) should be late Moundville III burials. There are other ways of manipulating these numbers, but using even the most conservative assumptions the number of known plus likely late Moundville III burials at Moundville equals several times the number from White.

Though Moundville's population was much larger than White's at this time, political relations between their occupants were not necessarily those of a complex chiefdom. Moundville was in its decline, as measured by number of burials made, amount of mound construction, and average number of imported items per burial (Steponaitis 1983a:151–161; Peebles 1985). It is difficult to determine how far this decline had progressed at the time the refuse deposit at White was being formed. The most obvious approach is to examine the chronological distribution of burials in Peebles's (1972, 1974; Peebles and Kus 1977) cluster analysis.

Peebles used a polythetic-agglomerative algorithm to distinguish groups of similar burials at Moundville. Ten clusters were formed. In eight of these clusters (III-X) males are contrasted with females and infants and children are contrasted with adults. These burials are interpreted as representing "commoner" status, or the subordinate dimension of status variability at Moundville. The other two clusters (I-II) comprise burials spatially

Table 3.6

Summary data on late Moundville III burials at Moundville[1]

Burial no.	Orientation (head towards)	Age & Sex[2]	Single or multiple	Associated artifacts
53/NE	-	-	single	plain pot with 12 handles (NE 14)
1611/NE	south	young child	multiple (1611-13/NE)	bowl (185NE) beside skull
1612/NE	south	adult male (>40 yrs., male)	"	water bottle frag. (186NE) behind head
1613/NE	south	adult male (30-35 yrs., female)	"	-
1180/EE	-	-	multiple (1180-84/EE)	(plow disturbed)
1181/EE	east	adult (35-40 yrs., female)	"	incised bowl (3EE) back of skull 2 long bone awls (57EE) near skull
1182/EE	east	adult	"	incised water bottle (1EE) back of skull notched rim bowl (2EE) back of skull
1183/EE	east	adult	"	water bottle (4EE) back of skull 2 beads (26EE) back of skull
1184/EE	-	child (5-10 yrs.)	"	water bottle (6EE) back of skull [also one incised water bottle not attributable to any one burial]

Table 3.6 (continued)

Burial no.	Orientation (head towards)	Age & Sex[2]	Single or multiple	Associated artifacts
1234/EE	-	-	multiple (1234-37/EE)	[this mult. burial is a mass of bones at the feet of 1233/EE, which was unaccompanied.
1235/EE	-	-	"	Burials 1237, 1245, and 1247/EE were also part of this multiple burial but position not noted]
1236/EE	-	-	"	artifacts with this multiple burial were water bottles (85EE, 86EE)
1237/EE	-	-	"	red bowl (87EE), bowl (88EE) crushed pot (89EE) pottery frags. from fill (90-93EE)
1261/EE	north	child	single	pot (124EE) left of skull small bowl, red slipped interior (125EE) ditto small incised bowl (126EE) ditto 15 shell beads (127EE) ditto
1291/EE	northeast	adult	multiple (1291-92/EE)	large sherd (202EE) rear of skull animal head effigy bowl (203EE) ditto
1292/EE	-	-	"	water bottle (204EE)
1718/SWG	-	-	single	plain water bottle (6SWG) in place of skull crushed pot (7SWG) over right foot
1720/SWG	-	child	single	bowl (8SWG) at left of skull
1725/SWG	-	adult female (35-40 yrs., female)	single	large frags. of bowl (9SWG) frags. of bowl w/ human head effigy (10SWG)

Table 3.6 (continued)

Burial no.	Orientation (head towards)	Age & Sex[2]	Single or multiple	Associated artifacts
2417/WP	north	adult (30-35 yrs., female)	multiple (w/ 2449/WP)	large incised bowl (121WP) inverted over head, bowl w/ red rim w/ white cross (122WP)
2449/WP	-	child (1-5 yrs.)	"	beads (123WP), 2 shell ear plugs (124WP)
2768/Rw (69+05 L2)	southeast	adult	single	bowl fragments (195Rw) at left shoulder pottery effigy pipe (189Rw) ditto
1956/Rho	-	adult	multiple (1956-57/Rho)	water bottle (141Rho) left of skull sherds (143Rho) near skull pebble hammer (144Rho)
1957/Rho	-	adult	"	broken pot (142Rho) under skull sherds (143Rho) near skull pebble hammer (145Rho)

[1] From Peebles (1979)
[2] Information in parentheses from M. L. Powell, pers. comm.

Table 3.7

Summary data on White site burials! file, Mound State Monument)

Burial no.	Orientation (head towards)	Age & sex	Associated artifacts and comments
1	-	-	-
2	west	small child about 3 yrs. old	Bell Pl. Hale carinated bowl w/ 4 nodes (Wh2) placed at right knee
3	-	-	4 perforated bear teeth (Wh3) at neck
4	-	-	-
5	southeast	adult male 5' 8"	7 cm sandstone disc (Wh4) at foot of skeleton
6	-	-	-
7	east	about 6' tall	4 perforated bear teeth (Wh5) at left wrist 10 cm sandstone disc (Wh6) at left hand "also paint, shells, whatnot"
8-13	-	-	-
14	east	infant	-
15	north	child	shell pendant (Wh50) poorly preserved
16	east	probably 2 yrs old	shell beads (Wh51) at wrist and neck copper ornament (Wh52) from chest (badly decayed) Miss. Plain Warrior jar w/ 20 handles (Wh53) right side of skull inverted on Ala. Riv. Incised bottle (Wh54)
16a	east	-	-

Table 3.7 (continued)

Burial no.	Orientation (head towards)	Age & sex	Associated artifacts and comments
17	-	infant	-
18	east	about 6 yrs old	frags. of decayed wood at feet
19	east	infant	sherd discoidal (Wh56) at hips
20	-	adult	-
21	east	-	"bones taken out" i.e. by the excavators
22	-	infant	"bone last stages of decay"
23	south	-	"bones charred"
24	east	-	-
25	south	-	along with Burial 24 "in very bad shape"
26	east	-	-
27	south	-	-
28	-	infant	Bell Plain *Hale* beaded rim bowl (Wh58) left of skull

[1] From unpublished notes on file, Mound State Monument

isolated from the rest of the population and associated with sets of artifacts which are not patterned by age or gender distinctions. These burials represent the superordinate dimension of status variability at Moundville, and the buried individuals are interpreted as the "nobility" of the society. A subset of seven burials in Cluster I are adult males (though sex determinations were not made by trained osteologists) buried in mounds, with copper axes, pearl beads, and copper-covered shell beads as grave goods. These are thought to be deceased paramount chiefs. The only one of these seven burials that can be dated had vessels of the late Moundville II period. Only one of the burials that date to late Moundville III was a member of the "nobles" clusters, and this only by virtue of the presence of 2 beads in the burial. To summarize, the superordinate dimension of status variability in Moundville burials cannot be demonstrated to have been present in late Moundville III times. In contrast, three burials at White contained artifacts which would place these burials among the Cluster I "nobility" at Moundville. Only one of these three is definitely dated as late as late Moundville III, however.

To restate this information, in the late Moundville III phase the occupation at Moundville was several or many times the size of that at White, yet there were no demonstrable "noble" burials at Moundville while there was at least one such at White. Since the majority of "noble" burials at Moundville have not been dated, there is not necessarily any discrepancy here. Given these facts, my interpretation is that in the later part of the Moundville III phase the chiefdom was declining in terms of access to non-local materials. Nevertheless, the society was still organized as a complex chiefdom with Moundville as the paramount center.

The final task of this chapter is description of the manner in which the refuse deposit excavation contexts are grouped into the analytic units which will be used throughout this study. It was mentioned above that the structure floor underlying the refuse deposit was only partially intact. Figure 3.11 shows the patchiness of this floor. For the most part, the absence of a discernible floor is due to small-scale bioturbation of the sediments. A number of larger natural and cultural disturbances are also present, including pits, rodent burrows, and one rotted-out tree stump. Representative profiles are shown in Figure 3.12. Materials recovered from most of the larger disturbances were not segregated from those of the apparently undisturbed deposit during excavation. In some cases the disturbances were not visible until lower, different-colored sediments were exposed, or until differential drying of profiles revealed intrusive features. Mostly, however, it was known during the excavation that disturbances were present but it was impossible to determine where the limits of disturbances were, or which areas were the disturbed and which the undisturbed. In truth, the only parts of the deposit which can be regarded as <u>not</u> reworked are the patches where sherds lie flat on the intact floor.

The refuse deposit was excavated in three levels. The top two levels were each 10 cm arbitrary levels. The third level comprised the material from 20 cm below surface to the floor level. Artifacts lying flat on the floor were left in situ and provenienced separately from the Level 3 artifacts. Difficulty in determining whether the floor was intact in a given location, and if so at what depth, resulted in Level 3 being excavated as several separately provenienced excavation contexts. These have been combined in the analysis. The floor itself was excavated and washed through windowscreen or processed by flotation. No artifacts 1/4 in (0.6 cm) or larger were present; the only artifacts present were small flecks of pottery, bone, shell, and charred botanical material. Below the floor level was a mixed Late Woodland/Mississippian midden. This was excavated in a combination of natural stratigraphic and arbitrary levels. Since only scant reference will be made to the subfloor data, and even then to these data as a single set, no further description of the sub-floor excavation is necessary here.

For the analysis of the White site refuse data there are four analytical dimensions by which the data can be grouped. Three of these dimensions have already been mentioned: excavation unit (e.g., 164N/107E); above versus below floor; and excavation layer (e.g., Level 1 or 0–10 cm below surface). The fourth dimension is the degree of

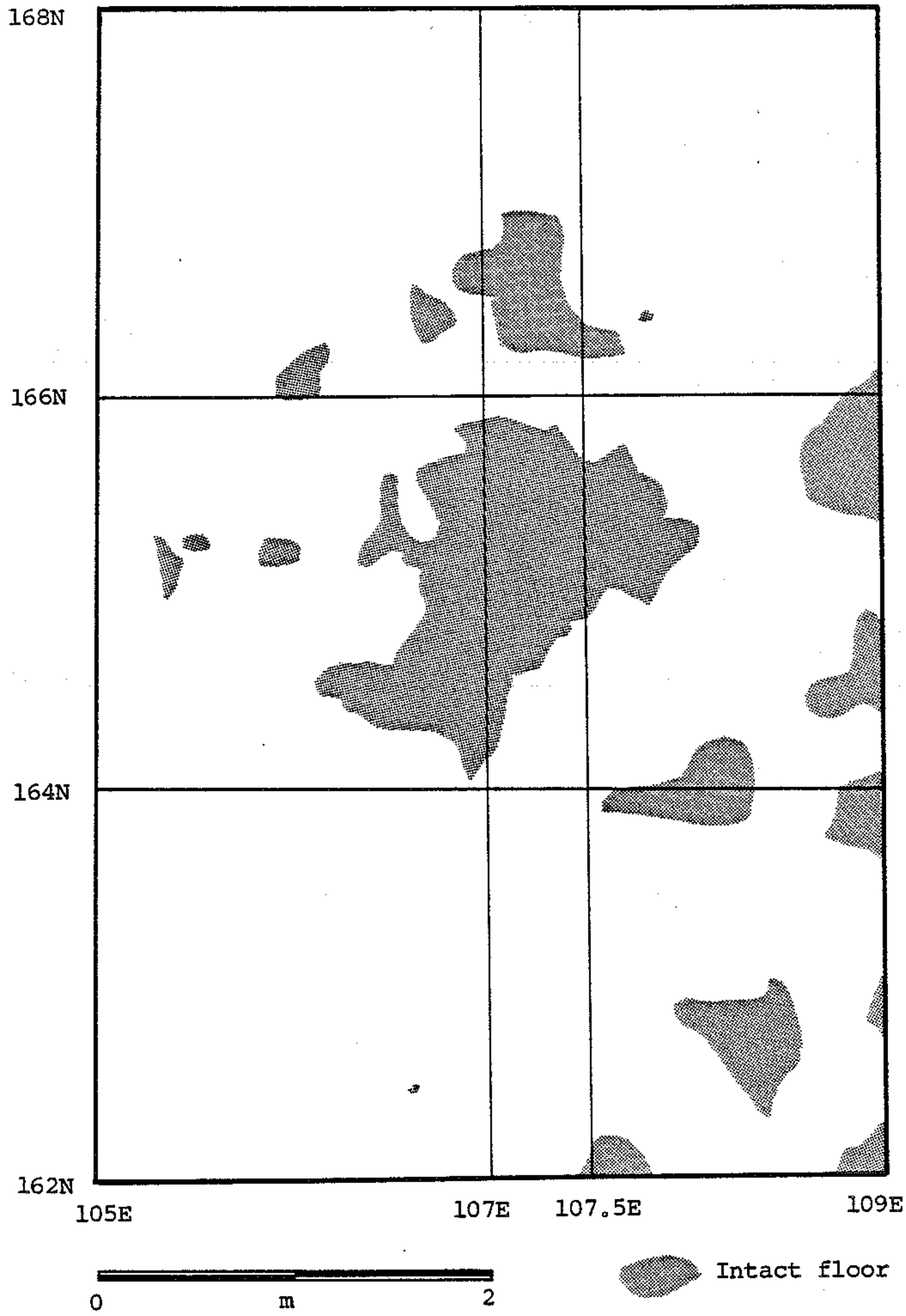


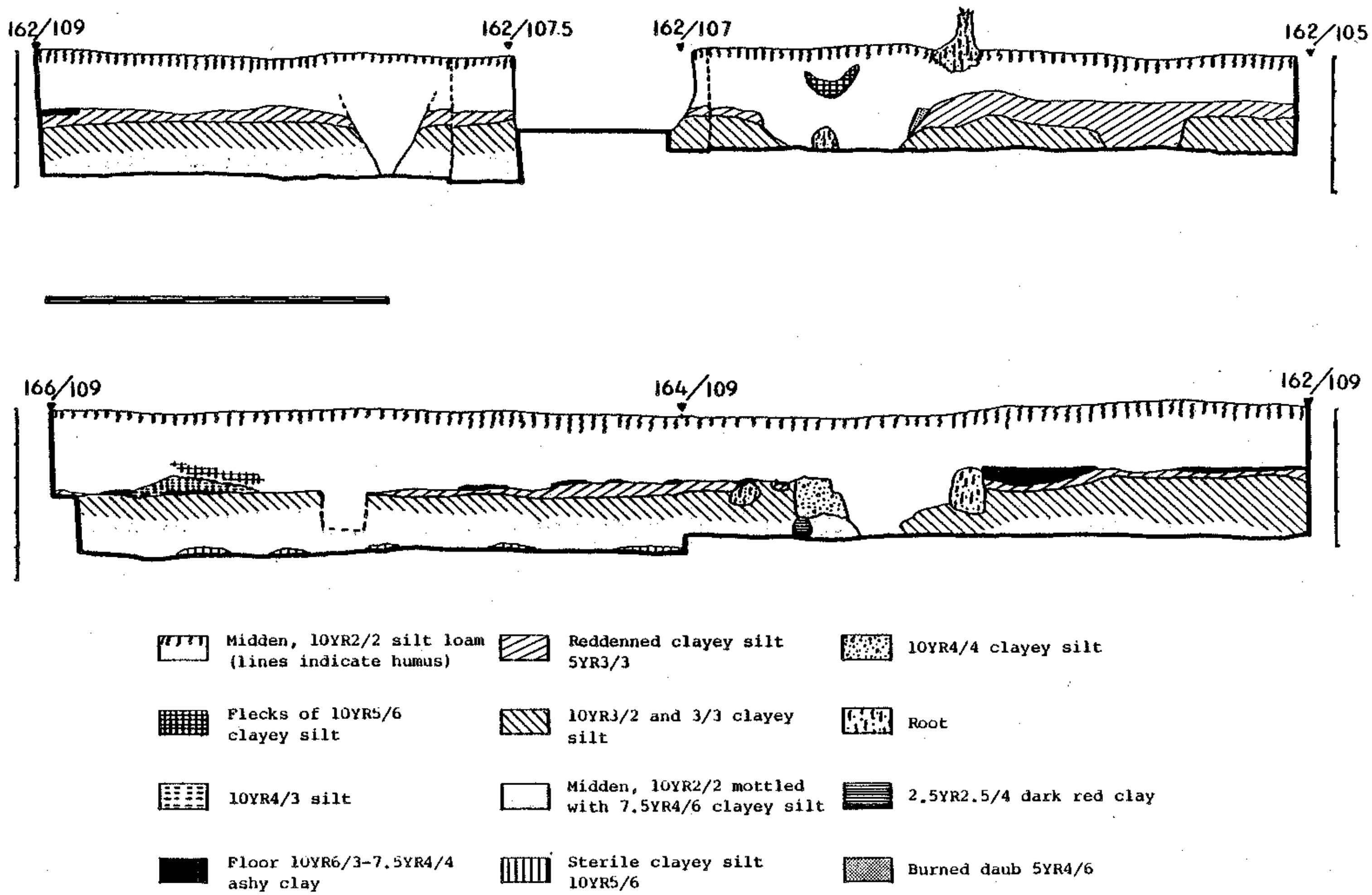
Figure 3.11

Map of floor below late Moundville III midden

Figure 3.12

Representative profiles from excavation of refuse deposit

Figure 3.12


162/109
162/107.5
162/107
162/105
166/109
164/109
162/109
Midden, 10YR2/2 silt loam (lines indicate humus)
Flecks of 10YR5/6 clayey silt
10YR4/3 silt
Floor 10YR6/3-7.5YR4/4 ashy clay
Reddenned clayey silt 5YR3/3
10YR3/2 and 3/3 clayey silt
Midden, 10YR2/2 mottled with 7.5YR4/6 clayey silt
Sterile clayey silt 10YR5/6
10YR4/4 clayey silt
Root
2.5YR2.5/4 dark red clay
Burned daub 5YR4/6

disturbance of the deposits. Since there was no significant accumulation of cultural debris after the late Moundville III period, the principal concern is the extent to which these data have been contaminated with earlier materials from below the floor. Poorer preservation of the earlier faunal and botanical material may minimize this problem for these two classes of data. The situation for lithics, however, is quite different. Relatively pure Late Woodland contexts at the site typically have 3-5 times more lithic items than sherds, while the proportion is exactly the reverse in relatively pure late Moundville III contexts. This means, for instance, that in a provenience unit with 5% admixture of Late Woodland ceramics, up to 50% of the lithics may be of Late Woodland origin. The late Moundville III refuse deposit typically has 3-10% admixture of pre-Mississippian sherds. Effectively, then, the lithic sample is heavily contaminated.

For non-lithic classes of data, however, a maximum of 10% admixture of pre-Mississippian ceramics is the criterion for accepting provenience lots for analysis. This cutoff point is arbitrary, but defensible in light of the pattern of provenience units which do not meet it. The two units which do not meet the criterion are the top 10 cm of 166N/107E and 166N/107.5E. The northern end of these units borders a ditch-like surface feature. Whether the feature is natural or artificial is not known, but the high proportion of pre-Mississippian sherds in the surface deposits beside it suggests that the ditch was dug and the spoil deposited alongside it.

This chapter can be summarized by repeating the main points. The prehistoric Moundville chiefdom is well known archaeologically, but to be suitable for evaluating models of chiefdom economic structure additional data were needed from a subsidiary center. Excavations at the White site produced many artifacts, but most of the contexts were chronologically mixed. Relatively unmixed late Moundville III refuse was encountered in one area. The refuse seems to have been produced by a combination of elite and non-elite households. The refuse was deposited at a time when the Moundville chiefdom was in decline, but the limited information available suggests that the Black

Warrior River valley population was still organized as a complex chiefdom. The refuse data can be examined in terms of horizontal coordinates, depth from surface, position relative to the underlying structure floor, and degree of contamination by earlier materials. The most extensively mixed contexts, i.e., those with more than 10% pre-Mississippian sherds, are eliminated from the subsequent analyses. Summary information on the analytical provenience units is presented in Table 3.8. Full artifact tabulations for all excavation contexts can be found in Appendix A.

Table 3.8

Summary data on refuse deposit analytical units

Analytical unit	FS nos.	Depth below surface (cm)	Volume (m^3)	Number of			Percent pre-Mississippian sherds
				sherds	bones	lithics	
162N/105E L.1	123	0-10	.4	657	235	302	2
L.2	127	10-20	.39	2373	616	595	2
L.3	133	20-floor	.09	563	257	128	3
floor	166	on floor	-	4	0	0	0
164N/105E L.1	104	0-10	.4	747	298	245	3
L.2	109	10-20	.34	2675	1537	547	3
L.3	114	20-floor	.14	550	326	126	3
floor	285-292	on floor	-	53	16	3	4
166N/105E L.1	85	0-10	.16	729	218	230	4
L.2	91	10-20	.37	1139	621	400	5
L.3	97, 193	20-floor	.29	1319	1129	441	4
floor	201, 207	on floor	.005	131	0	32	5
162N/107E L.1	42	0-10	.1	202	52	56	2
L.2	46	10-20	.1	521	141	118	3
L.3	50	20-floor level	.05	135	89	75	8
(floor not present)							
164N/107E L.1	54	0-10	.1	142	95	67	5
L.2	56	10-20	.1	298	281	70	2
L.3	61, 69	20-floor	.02	93	84	15	0
floor	198	on floor	-	4	0	0	0

Table 3.8 (continued)

Analytical unit	FS nos.	Depth below surface (cm)	Volume (m^3)	Number of sherds	Number of bones	Number of lithics	Percent pre-Mississippian sherds
166N/107E L.1	62	0-10	.08	72	34	37	13
L.2	65	10-20	.1	256	88	92	5
L.3	70, 72, 226	20-floor	.015	89	62	22	8
floor	219	on floor	-	1	0	0	0
162N/107.5E L.1	118	0-10	.3	684	280	284	6
L.2	121	10-floor	.2	545	209	132	2
floor	209	on floor	-	10	1	8	0
164N/107.5E L.1	75	0-10	.3	654	165	284	6
L.2	78	10-20	.27	975	404	312	3
L.3	80, 225	20-floor	.09	530	116	67	3
floor	211	on floor	-	42	15	3	2
166N/107.5E L.1	87	0-10	.14	62	14	49	16
L.2	93	10-20	.29	1149	172	369	5
L.3	96	20-floor level	.15	160	28	51	3
(floor not present)							
Totals			4.99	17,564	7583	5160	

CHAPTER IV

SUBSISTENCE

Introduction

The production, distribution, and consumption of food is a vital sector of any economy. Thus, it seems a good place to begin an examination of the economic structure of a chiefdom. The redistribution model and the mobilization model posit very different ways for the subsistence sector to be organized. The redistribution model envisions a chiefdom composed of units which have quite different resources and products, but which, through the action of a central "distributor", each receive a portion of other units' products. The mobilization model envisions a chiefdom composed of similar, self-sufficient units. Aside from occasional "famine relief", the principal movement of food across unit boundaries is the movement of food from domestic producers to the elite. In this chapter I compare these contrasting models with subsistence data from the Moundville chiefdom.

Several kinds of data are examined. First, there is the location of the units of the chiefdom: are they in similar or contrasting locations with respect to food resources? In the Moundville case the units of the chiefdom are the single-mound subsidiary sites with their neighborhoods of dispersed farmsteads. The second kind of data that is examined is the physical remains of foods and their byproducts. Both animal and plant food remains have been recovered from the White subsidiary site and from the paramount center at Moundville. The faunal data are examined first. Due to the small size of the analyzed faunal sample from Moundville, much of the faunal analysis involves comparisons between White and two Mississippian sites which are nearby but which were not Moundville subsidiaries. The plant food data from Moundville are of higher quality than the faunal data, and in the section dealing with botanical data the comparisons are restricted to sites within the Moundville chiefdom. Site location data are examined separately for faunal procurement and procurement of plant foods.

Fauna

Though faunal remains were not found in most portions of the White site, they were present in the late Moundville III refuse deposit. Within this deposit, faunal preservation varied from negligible in the top 5 cm of soil, to very good in undisturbed deposits above the structure floor that was approximately 25 cm below surface. All faunal remains from the refuse deposit, including those from below the floor, were identified to gross taxonomic category (e.g. small mammal, bird, turtle) by Scott Blanchard using comparative collections of the Museum of Anthropology and the Museum of Zoology, University of Michigan. Small mammal remains were further identified, to species when possible. The large mammal remains were also subjected to extensive further analysis, detailed below. The poor preservation, small sample size, and chronologically mixed nature of the subfloor samples makes it extremely difficult to extract useful information from these earlier materials. Throughout the following discussion, therefore, I include only the faunal material from above the floor and in excavation units with minimally mixed ceramics (as explained in Chapter III; see Appendix B for complete listing of all faunal data). 0 Within the faunal sample from unmixed contexts above the floor, differential preservation of bone does not appear to be a significant factor. Light, spongy bone generally is destroyed more rapidly than dense, solid bone, so that differential bone preservation typically results in assemblages dominated by dense skeletal elements (Lyman 1985). In the White site refuse deposit bone assemblage, there is only a low correlation between density of skeletal element and abundance of element (Kendall's tau-b = .24, p = .27, see Figure 4.1 and Table 4.1; bone density values and analytical procedures from Lyman 1985).

Four major questions about the subsistence economy of subsidiary centers can be addressed with faunal data:

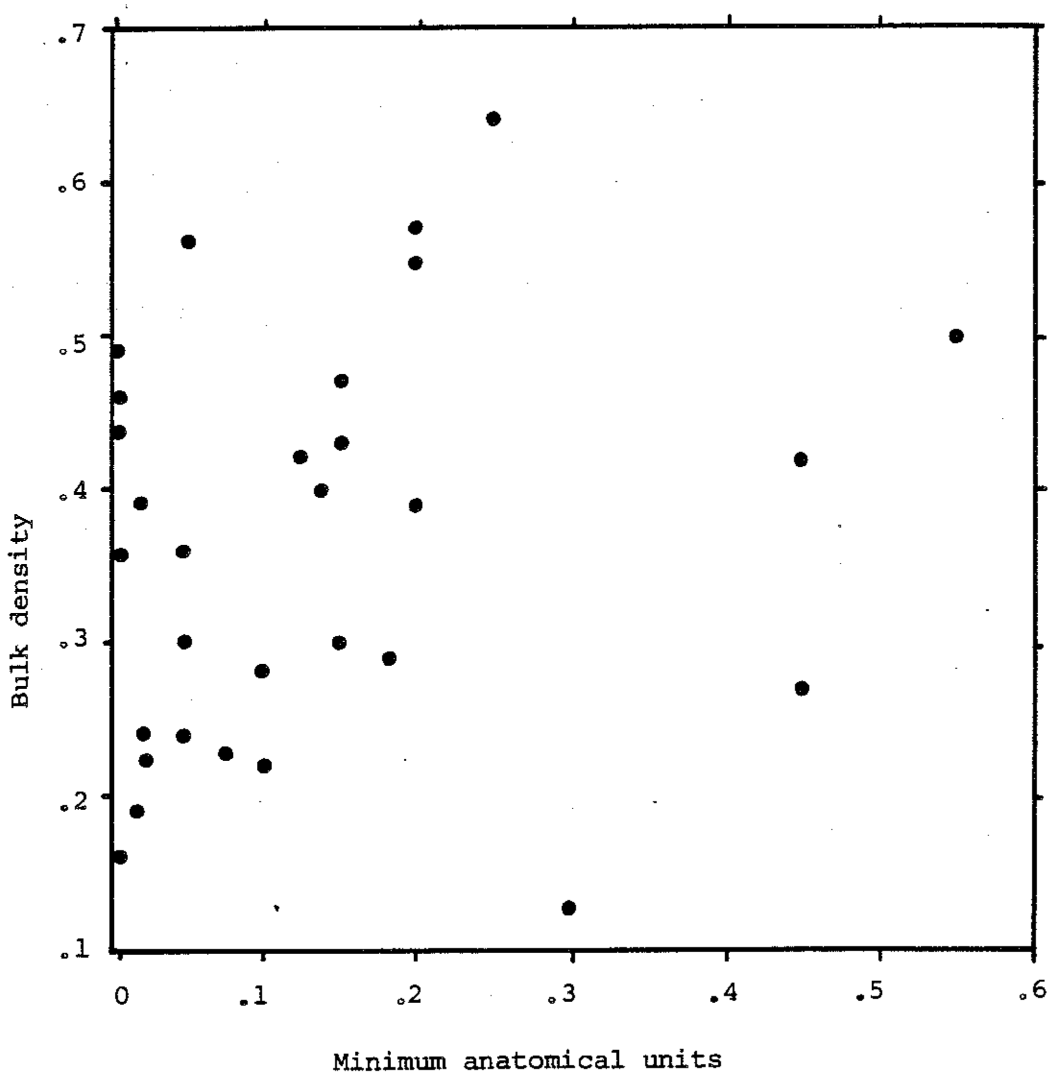


Figure 4.1

Scatterplot of deer bone density and abundance

Table 4.1

White site deer skeletal element abundances and bone density values

Skeletal element	No. of elements observed	No. in whole animal	MAU[1]	Bulk density (Lyman 1985)
Mandible	4	2	2.0	.57
Atlas	3	1	3.0	.13
Axis	0	1	0	.16
Cervical vert.	1	5	.20	.19
Thoracic vert.	3	13	.23	.24
Lumbar vert.	11	6	1.83	.29
Pelvis	9	2	4.5	.27
Sacrum	0	1	0	.19
Rib	36	26	1.38	.40
Sternum	1	1	1.0	.22
Scapula	0	2	0	.36
P. humerus	1	2	.5	.24
D. humerus	4	2	2.0	.39
P. radius	9	2	4.5	.42
D. radius	3	2	1.5	.43
P. ulna	1	2	.5	.30
D. ulna	0	2	0	.44
P. metacarp.	1	2	.5	.56
D. metacarp.	0	2	0	.49
P. femur	1	2	.5	.36
D. femur	2	2	1.0	.28
P. tibia	3	2	1.5	.30
D. tibia	11	2	5.5	.50
Tarsal	2	10	.2	.39
Astragalus	3	2	1.5	.47
Calcaneus	5	2	2.5	.64
P. metatars.	4	2	2.0	.55
D. metatars.	0	2	0	.46
Phalanx I	10	8	1.25	.42
" II	6	8	.75	.25
" III	2	8	.25	.25

[1] Minimum Anatomical Units

1) Did different components of the chiefdom use, or have direct access to, grossly different sets or mixtures of faunal resources?

2) Is there evidence of any net movement of meat into or out of subsidiary centers?

3) What do the faunal remains indicate about abundance of local fauna?

4) What do the faunal remains indicate about the extent of human modification of the local environment?

Overall Faunal Procurement

A prominent aspect of the redistributive model of chiefdom economies is the postulation that disjunct distributions of resources require a mechanism for their redistribution. Correlatively, the catchments of sites in a chiefdom are expected to differ significantly. Earle (1977, 1978) showed that this was not the case on the Hawaiian island of Kaua'i, but it is an open question whether this is generally true of chiefdoms. In the present case, components of the Moundville III phase are in very similar ecological settings. All subsidiary centers are on terrace-levees within .5 km of the river or a large oxbow lake. Residents at these sites, as well as residents of nearby farmsteads, would thus have had immediate access to the same basic set of faunal resources. That the available resources were actually exploited in the same proportions at each of the sites is an issue best resolved by examining faunal remains from each of the sites. Since this is not currently possible, a less direct approach is necessary.

In Table 4.2 the White site fauna is compared with fauna from several nearby Mississippian sites. Percentages by weight of identified fauna are used to eliminate the biasing effect of differential fragmentation of bone at the various sites. All data represent material from 1/4 in mesh waterscreen, except for the Moundville sample, which is from flotation samples (effectively 1/16 in mesh screen). The comparative data come from Moundville and from sites along the central Tombigbee River, 45–70 km northwest of the White site. Yarborough is a single-dwelling farmstead. Lubbub is a local chiefdom center, the apex of a two-level settlement hierarchy.

Table 4.2

Comparison of White site faunal data with fauna from nearby Mississippian sites

Site (Component)	Percent of identified bone by weight							Total weight identified (g)	Weight unidentified (g)
	Large mammal	Small mammal	Bird	Turtle	Snake	Amphibian	Fish		
White site (late Moundville III)	82.3	3.4	3.5	9.4	0.4	trace	1.0	2595.1	1010.1
Moundville[1] (Moundville I)	84.7	6.1	5.9	trace	--[4]	--	3.2	871.0	206.1
Yarborough[2] (Protohistoric)	73.7	6.4	4.6	13.3	0.9	0.2	1.0	11887.9	1118.1
Lubbub[3] (Protohistoric)	83.4	4.3	8.4	2.9	0.2	0.1	0.8	4738.4	411.8
Lubbub[3] (Summerville II/III)	83.4	4.1	7.1	0.1	0.1	0.1	0.6	4371.5	319.3
Lubbub[3] (Summerville I)	84.5	4.6	6.2	3.9	0.1	0.1	0.7	783.0	106.4

[1] Michals, unpublished data

[2] From Scott (1982:Tables 54, 56)

[3] From Scott (1983:Appendix B)

[4] Weight not available

The principal feature of the data in Table 4.2 is the overall similarity between sites. The proportions of faunal classes consumed are roughly the same, regardless of the position of sites in their settlement hierarchy. While the similarity of physiographic settings and of general consumption patterns may seem to be prima facie evidence against the redistribution model, the situation is actually much more complicated. The most important complication is that the similar overall consumption patterns might actually be the result of highly effective redistribution of faunal resources. Conceivably, despite similar settings, individual communities may have specialized in procuring restricted sets of fauna, but redistribution of these foods provided all communities with equal proportions for consumption. There are two reasons to believe this is not the case, both of them relating to the distance between sites.

First, we must keep in mind that bones are actually the by-products of preparation as well as consumption of meat. If the similarities in Table 4.2 are the result of efficient redistribution, then bones were being redistributed as well as meat. The straight-line distance between the northernmost and southernmost contemporary subsidiary sites of the Moundville chiefdom is 30 km; the sites are 70 km apart along the river. If meat were being moved in quantity between sites, movement of the entire skeleton as well as the meat would entail a considerable waste of energy. Most likely, at least some portions of the skeleton would be removed before transport in order to reduce the load weight. By extension, if sites were specialized in procuring different sets of fauna we would not expect the weight of bones of any given taxon to be similar at all sites. At the least, sites should differ markedly in the abundance of specific body parts of a given taxon. I show later in this chapter that sites do differ in the proportion of deer body parts. The differences, however, do not appear to be related to preparation of venison for transport.

There is a second reason that the distance between sites renders transportation of entire skeletons improbable. In the hot, humid Alabama summer meat spoils rapidly. Transportation of meat to and from the redistribution center would take considerable time, in many cases longer than fresh meat would remain edible even by aboriginal standards. At least during the summer, meat would likely have been dried before transportation. In the drying process most of the bones would be discarded (Swanton 1946:373–378). For example, Catesby ([1731–43] quoted in Swanton 1946:374) described meat-drying he saw in the Carolina-to-Florida area:

> Besides roasting and boiling, they barbecue most of the flesh of the larger animals, such as buffalo's [sic], bear and deer: this is performed very gradually, over a slow clear fire, upon a large wooden gridiron, raised two feet above the fire. By this method of curing venison it will keep good five or six weeks, and by its being divested of the bone, and cut into portable pieces, adapts it to their use, for the more easy conveyance of it... Fish is also thus preserved...

Again anticipating a later section of this chapter, the different relative proportions of deer body parts at different sites do not appear to stem from specialization in procuring and drying venison.

Despite the overall similarity of faunal proportions shown in Table 4.2, there are some differences that deserve comment. The Yarborough site had a relatively low proportion of deer bone, which Scott (1982:149–150) attributes to abandonment of the site for intensive deer hunting during November and December. The Lubbub site, in contrast, *was* occupied during this season, and much of the skeleton of deer procured then was deposited at the site. Yarborough also had relatively large amounts of turtle, snake, and amphibian bones. Scott argues that this is not simply the effect of seasonal abandonment of the site. She notes (1983;150) that the *number* of turtle, snake, and amphibian bones at Yarborough was roughly 4, 6, and 5 times higher, respectively, than in the combined Lubbub sample, despite similar overall sample sizes. Scott's conclusion is that hunting was more important at the Yarborough farmstead than at the Lubbub village. The White site is intermediate between Lubbub and Yarborough in faunal composition, with less amphibian bone than either site, and intermediate abundances of turtle and snake. By these criteria the Moundville fauna seems to indicate a low emphasis on hunting. The

Moundville sample, however, is so small that little importance can be attached to differences of a few percentage points.

Several factors besides the small size of the Moundville sample complicate these intersite comparisons. It would be helpful to compare bone counts and meat-weight contributions estimated from minimum-number-of-individual (MNI) values. These data are available for Lubbub and Yarborough (Scott 1983:Appendix B, 1982:Table 54), but bone counts are not available for Moundville non-mammalian fauna, and MNI values are not available for most non-mammalian fauna from Moundville and White.

The available MNI values for Moundville (Michals 1981) and White fauna are listed in Table 4.3, along with projected meat yields. Scott's (1983:Table 21) MNI-to-meat weight conversion factors were used, unless otherwise noted. The relative dietary contributions of large and small mammal remains at the two sites are very close: deer contributed 88.3% of the mammalian meat total at White, 92% in Moundville III deposits at Moundville, and 90.7% in Moundville I samples at Moundville. There is variation within the small mammal category. Beaver and raccoon contributed most of the small mammal meat at White, yet neither were identified in the Moundville samples. Instead, canids contributed most of the small mammal meat in the Moundville samples. The small mammal sample sizes are low, however, so these contrasts should be interpreted with caution. Though the avian fauna from White was not systematically identified, wild turkey and at least one teal-size bird are known to be present. Their inclusion in the meat contribution column in Table 4.3 would bring the overall large mammal/small mammal/ bird percentages into even closer alignment with the Moundville percentages.

Another factor to be borne in mind is that the Moundville sample comes from one area at the north end of the site. Judging from its location and associated artifacts, this area was not a residential precinct for "commoners" (Scarry 1986), though precisely what status the residents had is not entirely clear. Since faunal remains were not

Table 4.3

Faunal MNI values and meat weight contributions from the White and Moundville sites

Species	Moundville[1] (Moundville I)			White (Moundville III)		
	MNI	Projected meat yield (kg)	% of total meat yield	MNI	Projected meat yield (kg)	% of total meat yield
White-tailed deer	13	370.5	85.8	7	199.5	88.3
Gray squirrel	11	3.85	0.9	1	0.35	0.2
Fox squirrel	2	1.12	0.3	–	–	–
Squirrel (indet.)	–	–	–	1	0.46[2]	0.2
Swamp rabbit	2	2.0	0.5	1	1.0	0.4
Cottontail	4	2.0	0.5	1	0.5	0.2
Rabbit (indet.)	–	–	–	1	0.38[3]	0.2
Opossum	1	1.4	0.3	1	1.4	0.6
Raccoon	–	–	–	2	5.2	2.3
Domestic dog	2	7.2	1.7	–	–	–
Gray wolf	1	13.6[4]	3.2	–	–	–
Coyote	1	6.9[5]	3.2	–	–	–
Red fox (?)	–	–	–	1	1.8[6]	0.8

Table 4.3 (continued)

Species	Moundville[1] (Moundville I)			White (Moundville III)		
	MNI	Projected meat yield (kg)	% of total meat yield	MNI	Projected meat yield (kg)	% of total meat yield
Canid (indet.)	–	–	–	1	3.6[7]	1.6
Wild turkey	6	23.1	5.4	–[8]	–	–
Snake (indet.)	11	–	–	–[8]	–	–
Turtle (indet.)	4	–	–	–[8]	–	–
Total	58	431.67	100.2	18	225.99	100.0

1 MNI values from Michals (1981:92); meat yields for these and White site MNI values calculated using conversion factors in Scott (1983:Table 21).
2 Calculated using unweighted average of gray and fox squirrel meat yield values.
3 Calculated using unweighted average of cottontail and swamp rabbit meat yield values.
4 Meat yield value from Smith (1975:173).
5 Meat yield value from Gipson (1978:199); his average live weight values modified to eliminate red wolf hybrids, and assuming usable meat yield of 50% of live weight.
6 Calculated using value for gray fox.
7 Calculated using value for domestic dog.
8 Present but MNI not calculated.

systematically collected during the extensive, earlier excavations elsewhere at the site, it is not clear whether the provenience of the available sample biases its content.

There are yet other difficulties with the intersite comparisons presented here. For instance, Michals calculated Moundville MNI values by summing MNI values per feature, while I calculated MNI values by summing without regard for horizontal or vertical location. The highly stratified nature of the deposits at Moundville, as opposed to the partially mixed White site midden, may render this difference of approaches preferable to a [simplistically?] standardized approach, but the point is certainly debatable. Regarding comparisons between White or Moundville on the one hand, and Lubbub or Yarborough on the other, there is the problem of the presence or absence of black bear in archaeological assemblages. Archaeologists working in eastern North America have long recognized that culturally prescribed patterns of disposal of bear post-cranial remains may systematically underrepresent bear in archaeological assemblages (e.g., Parmalee et al. 1972; Smith 1975:118–119). Thus, the presence or abundance of bear bone may have little relationship with its dietary significance. Bear was identified in the Lubbub and Yarborough samples but not in the White or Moundville samples. Elimination of bear from the Lubbub large mammal data reduces the degree of similarity between the Lubbub and White site data. A host of other problems involved in comparing these data sets can be identified. Most of them are probably of minor importance individually, though their cumulative effect may be significant. Nearly all these problems are impossible to resolve without restudy of the original and/or new collections.

On the basis of the available data, it appears that overall faunal procurement strategies at Lubbub, White, and Moundville were similar, while there may have been greater emphasis on hunting at the Yarborough farmstead. It should be emphasized that the differences between sites are all quantitative, not qualitative. There is nothing in the available data suggestive of specialization of hunting activities by site, contrary to the expectations derived from the redistribution model.

Provisioning

While the site locations and faunal remains do not support the redistributive model, this does not necessarily mean that the mobilization model is accurate. In addition to specifying that all components of the chiefdom be situated with equally direct access to necessary resources, the mobilization model further specifies that elite members of society be provided with subsistence goods by commoners. I use the term "provisioning" to refer to such mobilization of subsistence goods. Provisioning should be visible archaeologically as a net movement of some kinds of foods, particularly the more desirable foods, from low status contexts of production and initial processing to high status contexts of consumption. In a brilliantly conceived analysis, Susan Scott (1981) presented evidence of provisioning in the Mississippian period in the central Tombigbee River valley. Since her analytic approach has appeared in publications (Scott 1981, 1982, 1983, 1984) unfamiliar or unavailable to those not specializing in Southeastern U.S. archaeology, her approach will be reviewed in some detail.

Scott's analysis was designed to determine whether different species or parts of an animal were consumed in different social contexts. She focused on the distribution of white-tailed deer remains at sites of different hierarchical levels in a two-tier, Mississippian settlement pattern. Yarborough (Solis and Walling 1982) is the lower-level site, a single-structure farmstead with an associated trash dump. Lubbub (Peebles ed. 1983a, 1983b, 1983c) is the upper-level site, a fortified village with a platform mound and central plaza. The inferred provisioning probably did not actually operate between these two sites, since there are other village-mound sites closer to Yarborough than is Lubbub. Rather, to the extent that both sites are typical of their respective site types, provisioning occurred in the broader communities of which each site was a component.

Scott's analysis, in outline, proceeded as follows. Each deer and unidentified large mammal bone was recorded separately for skeletal element, portion of the element, degree of completeness, and weight of the fragment. The bones of a complete deer skeleton were weighed to provide reference values for the relative weights to be expected if all portions of deer skeletons were discarded at an individual site. Use of bone weights rather than counts minimized the effects of between-site differences in degree of fragmentation. To further control for the effects of differential fragmentation, unidentified large mammal bone fragments—which in the Southeastern U.S. are most likely overwhelmingly deer bone fragments too incomplete to identify—were classified either as long bone fragments or as other unidentified fragments. Thus, at a gross level the highly fragmented unidentified large mammal fragments could be compared to the relative abundances of identified elements to determine whether long bones (or other parts of the skeleton) could be "hidden" in the unidentified fragments. The relative abundances of skeletal parts at the two sites were then compared to determine whether they differed from the reference values or from each other.

Scott's comparison of the data from the two sites showed that:

> [When] the relative frequencies of white-tailed deer skeletal elements in the two assemblages are compared, a pattern emerges which strongly suggests that ceremonial centers were provisioned to some extent by outlying settlements... What is different about the two assemblages is how well represented the heavily muscled elements are. Most of the meat on white-tailed deer is obtained from the upper limbs, which are far better represented in the Lubbub Creek assemblage. In contrast, bones of the skull and feet which produce little or no meat are far more common in the Yarborough site sample. (Scott 1981)

Scott was also able to show that the more extensive fragmentation of bones at Yarborough was not the cause of the discrepancy, since even among the unidentified large mammal remains, Lubbub had an appreciably higher relative weight of long bone shafts than Yarborough.

The White site faunal remains were analyzed by Scott's technique. Before the results are presented an additional issue must be discussed. In the area of the Lubbub and Yarborough sites in the Mississippian period, there was a two-level site hierarchy, namely the local centers with one or more mounds and the dispersed farmsteads. The Moundville area had a three-level site hierarchy: the multi-mound Moundville site, single-mound subsidiary centers such as White, and dispersed farmsteads. Clearly, we would expect the elite at Moundville to be provisioned. We would also expect the elite residents at the subsidiary sites to be provisioned. In the tribute model, however, subsidiary centers also collect or produce goods to be passed upwards to the paramount elites. Therefore, would we expect the White site overall to have a provisioned or a provisioning faunal assemblage?

The answer depends on several factors. One factor is whether (and what proportion of) meaty cuts of deer were among the goods passed upwards from the White site. Another factor is whether dismemberment of deer carcasses took place before or after deer meat was brought to the White site. I see no a priori basis for resolving either issue. Consequently, the results of the analysis may be ambiguous. If the deer assemblage is enriched in meaty cuts, we can assume the local elite was provisioned. If the assemblage is enriched in meat-poor cuts, or if there is no net enrichment of any body part, we cannot conclude that the local elite were not provisioned until data from farmsteads and from Moundville are available for a more complete determination of the spatial patterning of deer dismemberment and body part transport. As it turns out, the body part data indicate an enrichment of meaty body parts at the White site.

The deer body part data for the White, Lubbub, and Yarborough sites are presented in Table 4.4. These data are most easily comprehended by looking at Figure 4.2. Both the Lubbub and White data more closely resemble the complete deer profile than do the Yarborough data. The Lubbub and White profiles, however, are quite different. Each resembles the complete deer more closely than they resemble each other (Brainerd-Robinson coefficients: White-deer = 165.3; Lubbub-deer = 172; White-Lubbub = 152.5). Lubbub has higher than expected values for skull, fore limb, and hind limb, while White has higher than expected values for hind limb and feet. This suggests that the White site elite were provisioned with hind limbs only, instead of both fore and hind limbs as was the case at Lubbub. A note of caution is appropriate here: bones from some parts of deer which were consumed at the site might have been deposited somewhere other than the 4 x 6 m area which yielded the present sample. Since there is no evidence of preserved faunal remains elsewhere at the site, the issue cannot easily be resolved.

Though the sample is too small to permit a rigorous analysis, the differential abundance of bones of the axial skeleton suggests that the White site was provisioned with the entire posterior halves of deer, not just the hind limbs. Table 4.5 presents the counts and weights of the axial skeletal fragments. Lumbar vertebral fragments are more numerous than those of cervical or thoracic vertebrae, even though both cervical and thoracic vertebrae outnumber lumbar vertebrae in a normal deer. Gilbert (1980:126) gives the cervical:thoracic:lumbar vertebral formula for deer as 7:13:6. To show how markedly the White site deer vertebrae data depart from this formula, we can construct a measure analogous to "percent of MNI present". In this instance the sample is too small and too fragmented for MNI values to be meaningful. Rather, I assume that if whole deer were being consumed and discarded at the site, the actual number of cervical, thoracic, and lumbar vertebral fragments ought to maintain roughly the same proportionality as the number of these three types of vertebrae in a whole deer. By implication, I assume all vertebrae are subject to the same degree of fragmentation. Admittedly, this assumption may be unrealistic, though it is certainly more justifiable than comparing counts of fragments of grossly dissimilar skeletal elements. Taking the 11 lumbar fragments as the baseline (i.e., 100% of expected), the cervical and thoracic fragments are only 31% and 12.6% as numerous as expected, respectively. This greater relative frequency of lumbar vertebral fragments is paralleled by the number of pelvis fragments (9) relative to sternum fragments (1). While the sternum is more likely to suffer taphonomic loss than the pelvis, these relationships are suggestive of provisioning of the White site elite with posterior halves of deer. This conclusion, however, is uncertain until a larger sample size permits a more rigorous analysis.

Table 4.4

Proportions of deer body parts at White, Lubbub (Summerville I-IV), and Yarborough

Body part	% of identified elements by weight				
	Control deer[1]	White	Lubbub[2]	Yarborough[2]	Lubbub-Yarborough average
Skull	11.9	6.7	16.7	26.3	21.5
Axial	25.5	21.3	15.1	7.9	11.5
Fore limb	17.2	9.1	22.9	10.8	16.9
Hind limb	26.8	41.0	30.2	13.0	21.6
Foot	18.9	21.9	15.2	42.0	28.6

[1] Proportions from a single buck, aged ca. 14 months. Total weight of skeleton = 2573.4 g (Scott 1983:355)

[2] From Scott (1982:Table 52)

DEER BODY PART PROPORTIONS

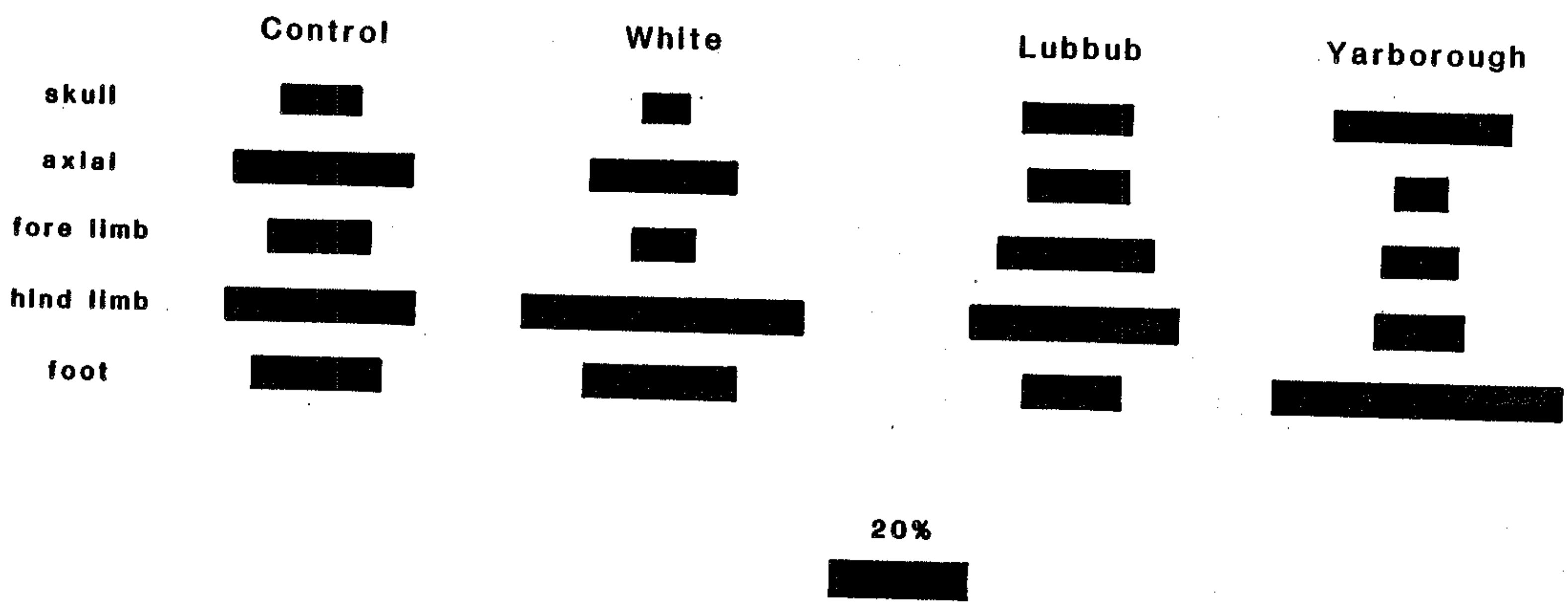


Figure 4.2

Comparison of deer body parts from the White, Lubbub, and Yarborough sites

Table 4.5

Frequencies of deer axial skeleton elements, White site (late Moundville III) and Moundville (Moundville I)

Element	No. of fragments	
	White	Moundville[1]
Vertebrae (total)	45	18
cervical	4	0
thoracic	3	8
lumbar	11	8
Indet.	27	2
Rib frags.	36	21
Sternum	1	0
Pelvis (total)	9	4
sacrum	0	1
ilium	1 (1R)	2
ischium	4 (3L,1R)	1
pubis	2 (1R,1?)	0
cf. innom.	2	0

[1] Michals, unpub. data

Regardless of whether the posterior vertebrae and the pelvis were included, it is interesting that the White site elite were provisioned with posterior cuts of meat. Bogan (1980:44) found that forelimbs were disproportionately abundant in high status parts of the Tocqua site in Tennessee, and suggested that this was a "prestigious cut" of the deer. Scott (1983:354–356) compared mound-associated and village contexts at Lubbub and found that while both fore and hind limbs were more abundant in mound context than in village context, the abundance of fore limbs was much more enhanced in mound context than that of hind limbs. It is dangerous to generalize from these results, but if it is true that fore limbs were the most prestigious cut, then conceivably the deficiency of fore limbs at the White site reflects the White site elite's inferior status relative to the elite at Moundville. That is, the White site elite were provisioned with meaty cuts (the hind limbs), but were themselves provisioning the higher elite with the choicest cut (the fore limbs). Admittedly, this is a post-hoc interpretation, but it points to the desirability of examining Moundville faunal remains along these lines.

Table 4.5 also presents the counts of deer axial skeletal data from Moundville. The conclusion I draw from these data is that the sample is too small to be meaningful. Michals (1981:93) listed MNI values (the sums of MNIs per feature for 30 features) for all deer elements present in her samples. She argued that the predominance of ribs and vertebrae was suggestive of removal of deer distal body parts before transportation to Moundville. Ribs and vertebrae, however, are the most numerous bones in the deer skeleton, and would outnumber the distal elements even if intact carcasses were brought to the site. Again, given the very small sample, it is not possible to reach any conclusions about the shape in which deer meat was brought to Moundville.

In comparing body part data from different sites, Scott (1983) argues that it is necessary to show that differential fragmentation, and hence differential identifiability, of bones between the sites is not responsible for apparent differences in abundance of body parts. By adding the weights of identified and unidentified long bone fragments and dividing by total weight of all large mammal remains, she showed that the more fragmented Yarborough remains were still deficient in long bones relative to Lubbub. Long bones comprised 64% of all large mammal remains at Lubbub, but only 55% at Yarborough. Figure 4.3 shows the percentage by element of bones reduced to one quarter or less of their original size, for Lubbub, Yarborough, and White. For most parts of the body, particularly the upper limbs and torso, the White site remains are the most extensively fragmented of the three. Unlike the situation at Lubbub where both fore and hind limbs appeared overrepresented, at White the fore limbs are underrepresented while the hind limbs are overrepresented. If differential fragmentation is <u>not</u> responsible for this pattern, we can predict that the overall percentage of large mammal long bone at White should be lower than at Lubbub and higher than at Yarborough. As shown in Table 4.6, this is in fact the case, confirming that bone fragmentation is not responsible for the pattern of relative body part abundances.

Abundance of Local Fauna

The seasonality of deer hunting and the age structure of the procured deer were examined, using dental age estimates provided by Susan Scott. The deer dental remains, unfortunately, reveal little about the seasonality of deer procurement. Estimation of deer age by dental wear and eruption patterns is most reliable when entire tooth rows are preserved intact. Most of the deer teeth in unmixed, above-floor contexts at White were isolated teeth. Consequently, the age ranges estimated for most of the teeth are too broad to be useful in determining season of death. One excavation unit contained three right deciduous premolars, which, if they came from a single individual, indicate an age at death of around 10 weeks. Assuming an average birth date of 1 August (cf. Scott 1982:150), this fawn probably died around the beginning of November. None of the other teeth can be assigned a range for age at death of less than 6 months. When a range this large is added to the dispersion of actual birth dates around the 1 August average, no reliable information on season of kill can be extracted.

The estimation of deer ages revealed something else about the deer remains, however. Most of the deer teeth were from mature adults. This is shown in Figure 4.4, in which the age structure of the White site deer is contrasted with that of Lubbub deer. The vertical scale in this figure is MNI for Lubbub. Since intact dentitions were rare at White, dental MNI estimates are not reliable. Instead, I have plotted the number of teeth (or partial dentitions) which may be in a given age range, e.g., a 3–5 year-old tooth (or dentition) contributes 0.5 to both the 3–4 and 4–5 year classes. The White site sample is very small, so conclusions about the age structure of the White site deer assemblage are necessarily tentative. It appears, however, that the deer from Lubbub and those from White have different age structures, with the Lubbub sample being primarily young individuals and the White sample being primarily mature adults (see Figure 4.4).

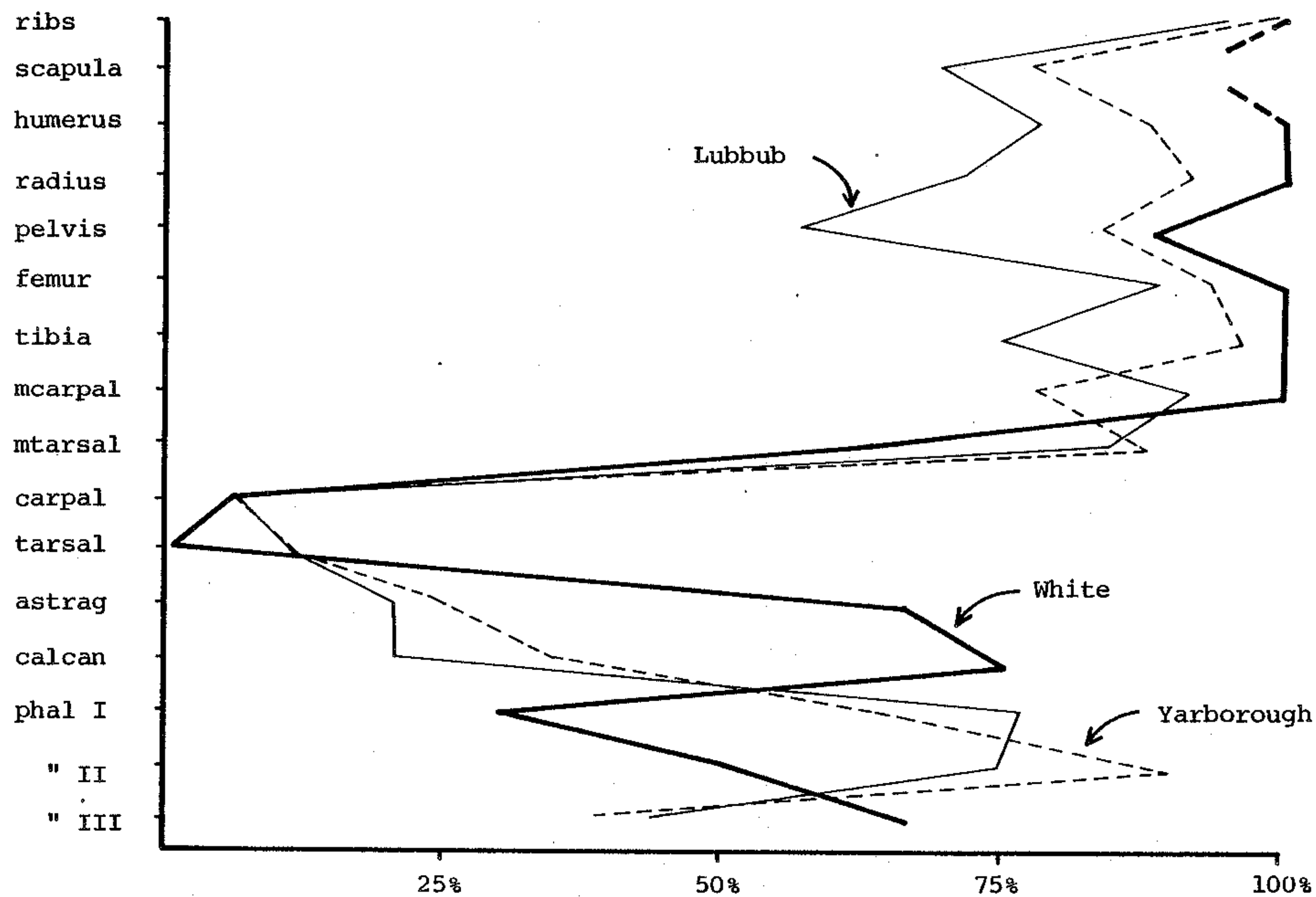


Figure 4.3

Percent of bone fragments one quarter or less of original size

Table 4.6

Large mammal body part data for White, Lubbub, and Yarborough

Body part	% of all large mammal bone by weight		
	White	Lubbub[1]	Yarborough[1]
Fore limb	4.7	13.9	5.1
Hind limb	21.3	18.3	6.1
Unid. large mammal long bone	37.7	31.8	43.6
Total long bone	63.7	64.0	54.8
Skull	3.5	10.1	12.3
Axial	11.1	9.2	3.7
Foot	11.4	9.2	19.6
Unid. large mammal bone	10.3	7.6	9.7
Total other bone	36.3	36.1	45.3
Total weight of large mammal bone	2137.8 g	14662.6 g	8678.0 g

[1] From Scott 1982:Table 52 (totals do not include identified bear bone)

There are two possible reasons for the age structure of the White site deer. First, a narrow focus on prime adults would be a rational hunting strategy only if there were an abundance of deer. Since deer extremities are present at White in about the frequency expected for whole deer (see above), most deer at White probably were procured fairly nearby. Therefore, the age structure implies there was a local abundance of deer. However, there is another possible explanation of the age structure. Provisioning of "nobility" may have involved principally the prime animals taken in the hunt. I question whether such selectivity accounts for the observed age structure, since cranial remains, and the anterior half of deer generally, are less abundant at the site than expected. If the

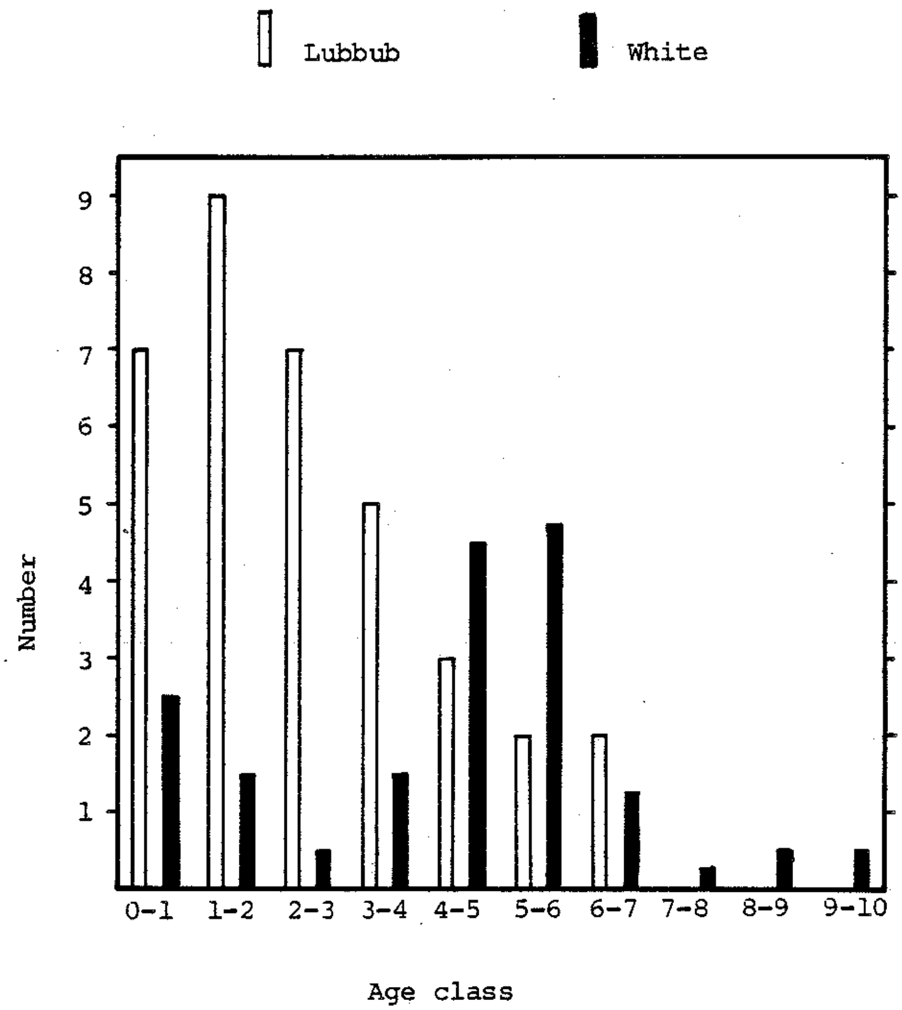


Figure 4.4

Age distribution of White and Lubbub deer

White site "nobility" were not getting anterior parts of deer generally, why would those anterior parts present be from prime individuals? Vagaries of sampling and preservation, of course, may be involved here, and I do not think the data are strong enough to discount the "noble gourmet" explanation.

Modification of the Local Environment

Faunal remains can provide another line of evidence on the local subsistence strategy, specifically, the extent of forest clearance near a site. The species composition of the fauna at a site should reflect the character of the local vegetation, particularly for the smaller fauna probably procured close to the site. Scott (1983:361–363), for instance, demonstrated a shift in the Lubbub subsistence remains from forest-dwelling to brush- or field-dwelling taxa coincident with the shift from foraging/gardening to dependence on agriculture. Specifically, she argued, the ratios of gray squirrel to fox squirrel and swamp rabbit to cottontail indicated the extent of forest clearance around the site. For both pairs of species, the White site faunal assemblage is dominated by the species preferring a closed forest habitat (swamp rabbit, gray squirrel) rather than a more open or successional one (cottontail, fox squirrel; see Table 4.7). This is true whether bone counts or bone weights are considered (since swamp rabbits and fox squirrels are larger than their congeners, count data should be given priority). Swamp rabbit bones are more numerous than those of cottontail (28:3) or cottontail plus indeterminate rabbit (28:6). No bones were identified as fox squirrel, and gray squirrel bones outnumber those of indeterminate squirrel (4:1). To the extent that the assumption of local procurement of small fauna is valid, these ratios indicate that the site environs were not extensively cleared for agriculture or lying fallow. By implication, population density must not have been sufficiently high to create a shortage of agricultural land.

As the reader may expect, however, there is a complicating factor. At Lubbub, most of the land surrounding the site was fairly well-drained and the soils were medium-textured. It would be suitable land for cultivation with aboriginal technology. At White most of the soils near the site are poorly-drained and clayey. The land probably would not have been cleared for fields even if there were a local shortage of agricultural land. Hence, the White site squirrel and rabbit ratios would have been informative if the field-preferring species predominated. The predominance of forest-preferring species reveals only that land shortage was not so severe that the populace was trying to farm the backswamp.

Table 4.7

Counts and weights of identified small mammal bones, White site

Species	Count		Weight	
	N	%	N	%
Canis sp.	11	13.9	20.06	39.7
Swamp rabbit	28	35.4	9.04	17.9
Cottontail rabbit	3	3.8	0.96	1.9
Rabbit (indet.)	3	3.8	0.42	0.8
Opossum	13	16.5	7.82	15.5
Raccoon	12	15.2	5.56	11.0
Beaver	1	1.3	1.61	3.2
Gray squirrel	4	5.1	1.55	3.1
Squirrel (indet.)	1	1.3	0.17	0.3
Red fox?	2	2.5	3.27	6.5
Rodent	1	1.3	0.04	[1]
Total	79	100.1	50.5	99.9

[1] trace

Summary

The four questions posed of the faunal remains have been answered with varying degrees of success. First, current data suggest that all sites of the Moundville chiefdom had direct access to the same overall set of faunal resources, and exploited them in a fundamentally similar way. Larger samples, further quantification of available samples, and samples from additional sites are necessary to add confidence to this conclusion.

Second, there is strong evidence for provisioning of the elite residents at the White subsidiary center. These elite members of society preferentially received meaty posterior portions of white-tailed deer, though the distribution pattern for the rest of the carcass is not yet known. Third, the age structure of the deer at White suggest an abundance of local fauna, though post-kill selection of deer for transport to White cannot be ruled out as the cause of the age structure's shape. Fourth, the species composition of the small mammal remains does not reveal any <u>severe</u> shortage of agricultural land, but the small mammal remains are expected to be a relatively insensitive indicator of such shortage.

<u>Plant Exploitation</u>

The patterns of production and distribution of plant resources in the Moundville chiefdom can be examined through a combination of catchment analyses and study of the botanical remains from the White site. Site catchment data have already been studied by Peebles (1978a) and Bozeman (1982), though with different aims. The analysis of botanical remains from White focuses on material from the late Moundville III refuse deposit.

Three issues about the subsistence economy of the chiefdom are examined below:

1) Did all communities of the chiefdom have similarly direct access to wild botanical resources?
2) Were all communities at locations with similar potential agricultural productivity?
3) What was the pattern of plant utilization at White, and is this consistent with the expectations derived from the catchment analysis?

<u>Site Catchments: Wild Plant Resources</u>

The location of the Moundville chiefdom with respect to regional phytogeography is presented in Chapter III. An important point in that discussion is that, while several substantially different vegetation associations (e.g., Black Belt prairies, Cumberland

Plateau mixed mesophytic forests) occur near the sites of the Moundville chiefdom, all of the sites are on the Black Warrior River floodplain. Thus, some sites are closer to the Fall Line Hills forests and others are closer to the Black Belt, but all of the sites are in grossly similar settings. There is one important exception to this statement. Moundville itself sits on a high terrace at the edge of the floodplain, with the river on one side and the Fall Line Hills on the other. Generally, however, there is no major phytogeographic difference between sites of the chiefdom such as the redistribution model would imply.

The overall similarity of the locations of the subsidiary sites can be seen at a finer scale by looking at the distribution of soil types nearby. Bozeman (1982:284) lists the area of each of 15 soil types found within a 1 km walk from each site (it is assumed that catchments did not cross substantial bodies of water, unless the far side could be reached by a 1 km walk around the margins). These soil types can be grouped into five classes on the basis of drainage characteristics (Rowe et al. 1912; Winston et al. 1914), which largely determine the vegetation naturally occurring on them. The soil type groupings are listed in Table 4.8. The proportional representation of these groups by catchment is presented in Table 4.9. Only sites occupied during Moundville III are listed in this table, in order to avoid comparison between sites occupied during different stages in the growth of the Moundville chiefdom. Five of the six sites are surrounded by moderately well drained soils, with variation in the frequency of flooding. The sixth site, White, contrasts sharply with the other five because most of its catchment is poorly drained. To determine whether this constitutes partial support for the redistribution model the significance of the contrast must be examined more closely.

The data in Table 4.9 come from soil surveys performed early in this century (Rowe et al. 1912; Winston et al. 1914). The coarse grain of the mapping probably exaggerates the differences between sites. Though more recent soil surveys exist for the 2 relevant counties (Edwards et al. 1939; Johnson 1981), they are not comparable either in the soil types distinguished or in the level of mapping detail. Nevertheless, the 1 km radius

Table 4.8

Grouping of soil types by drainage characteristics[1]

Poorly drained, frequently flooded	Moderate drainage, regularly flooded	Moderate to good drainage, rarely flooded	Moderate to good drainage, level or rolling uplands	Well drained, steep uplands
Waverly clay loam	Huntington silty loam	Cahaba sandy loam	Greenville loam	Guin sandy loam gravelly sandy loam
Bibb fine silty loam	Cahaba silt loam	Cahaba fine sandy loam	Susquehanna fine sandy loam	Orangeburg gravelly sandy loam
	Ocklockonee fine sandy loam	Cahaba loam	Ruston fine sandy loam	Orangeburg fine sandy loam
		Kalmia fine sandy loam		

[1] From Rowe et al. (1912) and Winston et al. (1914)

Table 4.9

Areas of soil groups in 1 km catchments for Moundville III single-mound sites[1]

Site	Poorly drained, frequently flooded		Moderate drainage regularly flooded		Moderate to good drainage, rarely flooded		Moderate to good drainage, level or rolling uplands		Well drained, steep uplands	
	ha	%	ha	%	ha	%	ha	%	ha	%
1 Tu 2/3	-	-	365	80	15	3	55	12	20	4
1 Tu 46/47	-	-	235	50	235	50	-	-	-	-
1 Tu 42/43	-	-	-	-	403	100	-	-	-	-
1 Ha 14/15	159[2]	29	-	-	382	71	-	-	-	-
1 Ha 107A	26	5	-	-	499	95	-	-	-	-
1 Ha 7/8	516	92	-	-	43	8	-	-	-	-

[1] Adapted from Bozeman (1982:284)
[2] Area of Cahaba clay loam listed by Bozeman (1982:284) was a typographical error; value used here is correct.

catchment of the White site definitely is relatively more flood-prone and less well drained than the other Moundville III site catchments. It is thus expected to have had different proportions of naturally occurring vegetal resources.

The composition of Black Warrior floodplain forest communities has been studied by Margaret Scarry (1986). She identified three physiographic settings on the floodplain (riverbank, swamp, and bottomland), and tallied General Land Office (GLO) witness tree counts for each setting. The GLO surveys were conducted from 1819 to 1821, which was before Euro-American settlement in the area significantly altered the local forest composition, and after a 140-year hiatus in Native American occupation of the area (Knight 1982:37–77; Curren 1984:238–239; Scarry 1986). Thus, the reconstructed vegetation represents what would be found with minimal anthropogenic disturbance. Information from Scarry's forest reconstruction is presented in Table 4.10.

The White site would have had significantly more Swamp forest nearby than did the other Moundville III sites. In terms of economically important species, this equates to a relative scarcity of nuts and fruits. The White site catchment would have had relatively low acorn abundances despite the higher overall proportion of oaks in Swamp forest than in Bottomland forest. Most oaks in Swamp forest are red oaks, which generally have bitter acorns. Though the responsible tannins can be leached out, it is a time-consuming process which is not mentioned in any of the early European descriptions of aboriginal nut utilization in the Southeast (Swanton 1946:346–347). The same point applies to hickory nut abundances. Not only are hickories less abundant in Swamp than in Bottomland forest, but relatively more of the Swamp hickories would have been bitternut and water hickories (<u>Carya cordiformis</u> and <u>C. aquatica</u>), which have bitter nuts.

Though nuts were likely the most important wild botanical resource, most other economically important plant species are not climax forest species. Most edible fruits, berries, seeds, greens, and tubers used by Southeastern Indians are successional species (Swanton 1946:265–297; Jackson 1986:162–200). Their abundance would be greatly

Table 4.10

Composition of naturally occurring Moundville-area forests[1]

Bottomlands		Swamp		Riverbank	
Tree	% of trees counted	Tree	% of trees counted	Tree	%of trees counted
The ten most common trees					
Holly	11.01	Holly	11.11	Maple	21.22
Sweetgum	9.78	Sweetgum	10.18	Ash	11.42
Beech	9.68	Willow oak	9.25	Hackberry	10.61
White oak	9.47	Black gum	8.79	Sycamore	8.97
Pine	7.10	White oak	7.40	Beech	6.53
Red oak	5.66	Beech	7.40	Hickory	4.89
Maple	5.45	Maple	6.94	Sweetgum	4.89
Hickory	4.73	Ash	5.09	Elm	4.48
Blackgum	3.91	Cypress	4.16	Mulberry	4.48
Bay	3.50	Hornbeam	3.70	Sassafras	4.48

Table 4.10 (continued)

Bottomlands		Swamp		Riverbank	
Tree	% of trees counted	Tree	% of trees counted	Tree	%of trees counted
Food producing trees					
Hickory	4.73	Hickory	2.77	Hickory	4.89
White oaks	11.63	White oaks	7.86	White oaks	.81
Red oaks	11.30	Red oaks	17.56	Red oaks	2.43
Chestnut	.51	Chestnut	0	Chestnut	0
Walnut	.10	Walnut	0	Walnut	0
Hazel	.10	Hazel	0	Hazel	0
Persimmon	.72	Persimmon	.46	Persimmon	0
Mulberry	1.23	Mulberry	2.31	Mulberry	4.48
Cherry	.10	Cherry	0	Cherry	0
Paw paw	.10	Paw paw	0	Paw paw	0
Haw	0	Haw	.46	Haw	0
Hackberry	.41	Hackberry	0	Hackberry	0

[1] From Scarry (1986)

increased over natural levels by creating forest edges with field clearance and through allowing cleared fields to lie fallow. Since details of the extent and distribution of fields around Moundville III sites are not known, it is impossible to compare site catchments in terms of the abundance of these resources. The relatively large proportion of permanently wet and/or not-easily-tilled soils around the White site suggests that there might have been a higher ratio of forest area to field area around this site than around its contemporaries.

Some indication of the degree of forest disturbance around the White site is provided by the wood charcoal in the late Moundville III refuse deposit. Extensive fragmentation of the charcoal resulted in low numbers of identifiable pieces. Charcoal from two flotation samples and one 1/4 in waterscreen sample were identified by Margaret Scarry (see Table 4.11; five additional flotation samples were examined but had too little charcoal for reliable quantitative analysis). The predominance of pine in the wood charcoal is striking in light of the low number of pines expected for the vicinity of the site. In Scarry's (1986) forest reconstruction only 7.10% and .46%, respectively, of Bottomland and Swamp forests were pines. Since pine abundance in the region around Moundville is related to the frequency of forest fires (Harper 1943:127–150), the high proportion of pine charcoal in the late Moundville III refuse deposit at White may indicate that uncleared forests around the site were fired often. Pine is also a successful colonizer of old fields, hence the abundance of pine charcoal could also indicate the presence of extensive fallow fields around the site. Larger samples, and sampling of additional contexts at the site are desirable before great certainty can be attached to these interpretations. Nevertheless, the pine charcoal abundance contrasts strikingly with the expected background of oaks, elm, ash, sweet gum, red gum, etc.

Charred seeds in the late Moundville III refuse deposit could provide further information about the alteration of natural vegetation associations near the site. Unfortunately, however, the number of seeds in the analyzed samples is too small to be very informative. Table 4.12 lists the carbonized seeds recovered from six flotation

Table 4.11

Identified wood charcoal from late Moundville III refuse deposit, White site

Taxa	Flotation samples		1/4 in waterscreen		Total	
	N	%	N	%	N	%
Acer (Maple)	1	2.5	–	–	1	1.7
Carya (Hickory)	1	2.5	–	–	1	1.7
Diospyros (Persimmon)	–	–	1	5	1	1.7
Fraxinus (Ash)	–	–	1	5	1	1.7
Liquidambar (Sweetgum)	1	2.5	1	5	2	3.4
Pinus (Pine)	30	76.9	14	70	44	74.6
Quercus	–	–	–	–	–	
red oak	–	–	2	10	2	3.4
white oak	3	7.7	–	–	3	5.1
Ulmus (Elm)	–	–	1	5	1	1.7
Zea mays (Maize stalk)	3	7.7	–	–	3	5.1
Total	39	99.8	20	100	59	100.1

samples (a seventh flotation sample was examined but contained no carbonized seeds). Sorting and identification were performed by Margaret Scarry. Two of the flotation samples (6 liters each) were from the late Moundville III refuse deposit (164N/105E L.2 and 3). The other four were 100% samples of thin lenses which composed the intact structure floor in 164N/107E. Total volume of these four samples was 9.75 liters. Data for the individual samples may be found in Appendix C.

There are generally low numbers of items per taxon, with two exceptions. One of these exceptions, the count of persimmon seed, is largely spurious. Most of the other items in the table represent whole seeds, while the entries for persimmon are counts of seed fragments. Persimmon seeds being relatively large and easily identified even when fragmented, the persimmon counts should not be directly compared to the other seed counts (M. Scarry, pers. comm.)

The other exception to the generally low seed counts is grass seed (Poaceae) in the floor deposits. Two distinct types are represented, with 77 specimens of type 1 and 41 specimens of type 2. Scarry was unable to identify these grasses, but they definitely are not maygrass, little barley, or fescue. Several different processes might account for the high incidence of charred grass seeds in the floor sediments. Since the sediments are ashy perhaps the seeds are part of a generalized spread of hearth ash. Another possibility is that parts of the structure caught fire from time to time—the floor is oxidized in places—and charred seeds from roof thatch or floor matting became incorporated in the floor when the structure was refurbished. Or perhaps these seeds are byproducts of intentional collection and parching of grass seeds. Without more complete information about the function(s) of the structure or the taxonomy of the seeds, it is impossible to eliminate any of these alternatives. The high incidence of these seeds is not replicated in any of the large number of floor deposits Scarry has sampled at Moundville, nor am I aware of any comparable data from Mississippian floors elsewhere in the Southeast.

Table 4.12

Carbonized seeds from late Moundville III refuse and floor contexts, White site

Taxa	Refuse deposit (2 samples, 12 liters total)	Floor deposit (4 samples, 9.75 liters total)
Amaranthus (Pigweed)	–	1
Celtis (Hackberry)	–	2[1]
Chenopodium (Goosefoot)	–	1
Compositae (Composites)	–	1
Diospyros (Persimmon)	35	119
Galium (Bedstraw)	–	1
Ilex cf. verticilliata (Winterberry)	2	2
cf. vomitoria (Yaupon)	1	–
Oxalis (Wood sorrel)	1	1
Passiflora (Maypop)	1	5
Phalaris (Maygrass)	3	4
Phytolacca (Pokeweed)	4	–
Poaceae type 1 (Grass)	5	77
type 2 (")	3	41
Polygonum (Knotweed)	–	3
Portulaca (Purslane)	–	1
Rhus (Sumac)	1	–
Vitis (Grape)	1	1
Total identified	57	258
Unidentified	1	3
Unidentifiable	27	74

[1] Not carbonized but included here because Lopinott (1984) argues Celtis seeds may preserve without carbonization.

One final note is necessary before turning to the agricultural side of subsistence. One holly seed from the late Moundville III refuse deposit is tentatively identified as Ilex vomitoria, the yaupon holly. Yaupon was the basis of the "black drink", an important, ceremonially consumed tea widely noted by early European observers in the Southeast (see Merrill 1979; Fairbanks 1979). Harper (1944:148–149; Harper in Jones n.d.) found specimens of yaupon growing at Moundville. Noting that yaupon rarely occurs naturally far from the sea coast, he speculated that yaupon had been transplanted to Moundville prehistorically so that a local source would be available to the occupants of the large Moundville site. Distribution data summarized by Merrill (1979:Map 1) reaffirm the primarily coastal distribution of the shrub, though the number of examples found well away from the coast leave it a moot point whether yaupon might occur naturally in the Moundville area. The shrub prefers "the harsh life of the semi-xeric conditions of the seashore and is adapted to a far lesser extent for the sterile bluffs on inland rivers" (Hu 1979:10). While the high river bluffs at Moundville might well have supported a natural population of yaupon (2 seeds are tentatively identified from Moundville I deposits at Moundville [M. Scarry, pers. comm. 1986]), the wetter character of the White site suggests that the plant likely would not grow there without human intervention. Since the tea was made with the leaves only (and these were widely traded in the early historic period), it is unlikely that a yaupon seed would be found at White unless the plant grew near the site. The conclusion to be drawn from this is that if the cf. vomitoria seed from White really is yaupon, the shrub probably was cultivated there.

Site Catchments: Agricultural Resources

Maize was the staple food of Mississippian populations, as evidenced by the accounts of early European explorers (Swanton 1946:304–310), by the large amounts of maize recovered from Mississippian archaeological sites (Yarnell and Black 1985:103), and by the carbon isotope composition of the bones of Mississippian people (Broida 1984; Rose and Marks 1985; Boutton et al. 1986). As with any agriculture-dependent population, a basic measure of the economic self-sufficiency of a community is its ability to produce enough of the staple crop for its own consumption. In its most extreme form, however, the redistribution model stipulates that a chiefdom integrates communities that are so ecologically disparate that staple foods would have to be imported to some of the communities. The tributary model, in contrast, posits that chiefdoms typically are composed of self-sufficient communities. In comparing these models, therefore, it is important to determine whether all communities of the Moundville chiefdom could have produced sufficient maize for their own consumption.

The maize productivity of Moundville-area site catchments was examined by Peebles (1978a:400–410). He was able to measure the maize productivity of Moundville-area soils on an interval (but not ratio) scale, using soil type-specific maize yields from the early 1900s. This was before the introduction of hybrid maize, machine plowing, and soil conservation practices. Factors beyond his control introduced a number of inaccuracies into his analysis, e.g., inaccurate site sizes, erroneous site locations, and inclusion of sites of different time periods. These inaccuracies were detected during the 1978–79 UMMA survey and testing program, and the new data were analyzed by Bozeman (1982) using Peebles's technique. In general, the size of archaeological sites of the Moundville chiefdom correlated highly with the agricultural productivity of 1 km radius catchments around the sites. One site, 1 Tu 42/43, is an extreme outlier in this relationship, so much so that its inclusion in the calculations turns a strong positive correlation ($r > .7$) to a weak negative one. Assuming population size varied linearly with site size, and excepting 1 Tu 42/43, all of the sites would have been equally able to support themselves. The anomalous position of 1 Tu 42/43, however, is not the only problem with this analysis. The other issues will be addressed after the problem of 1 Tu 42/43.

The 1 Tu 42/43 site is located across the river and about 4 km upstream from Moundville. Aside from a variety of pre-Mississippian occupations, the site dates primarily to Moundville III and possibly the Protohistoric period as well. Herein lies one difficulty. There was an extensive burial urn cemetery immediately adjacent to the site (Curren 1984:122–124). Though Curren states that the main area of the Protohistoric village associated with the cemetery is across an intermittent stream from 1 Tu 42/43, the 1978 UMMA surface collection of the latter site demonstrates that a Protohistoric component of unknown size was present there also (Bozeman 1982:162). It may be that the difficulty of distinguishing Moundville III from Protohistoric artifacts significantly inflates the apparent Moundville III occupation size. Another problem is that the 1 Tu 42 mound was intentionally plowed down by the landowners in the 1950s. This activity is likely to have artificially expanded the area in which Moundville-era artifacts are distributed, hence increasing the apparent site size. Both of these factors suggest that the size used for this site in Bozeman's analysis is too large. Reduction of the site's size would bring it closer to the size:productivity ratio of the other single-mound sites. Whether these factors account entirely for the site's anomalous position cannot yet be determined.

A less obvious problem with Bozeman's analysis is the way in which catchments were measured. Both Peebles and Bozeman limited their catchments to the area which could be reached by a 1 km walk without crossing major oxbow lakes or the river. Though the known distribution of archaeological sites precludes major shifting of the river course during the last thousand years, some change is known to have occurred. For instance, the present Cypress Cutoff Lake 4–5 km north of the White site was the active river channel in the early 1800s (M. Scarry, pers. comm. 1986). At several of the Moundville-era sites the opening or closing of one end of a cutoff lake would have a dramatic impact on the amount of land which would be included in the 1 km catchment. The dependence of the productivity measures on catchment area can be seen in Figure 4.5 (data in Table 4.13). The correlation coefficient between catchment size and productivity for all single-mound sites plus Moundville is $r = .78$ ($p < .01$). The correlation is even higher if only single-mound sites of Moundville III date are used in the calculation: $r = .85$ ($.05 > p > .01$). Clearly, the results of Bozeman's and Peebles's analyses are highly dependent on the twin assumptions that major bodies of water were not crossed to reach fields, and that major bodies of water were in the same locations as they are today.

Redefining catchments to disregard whether water had to be crossed may sound like a reasonable way to avoid these problems, but before this analysis can be useful we need additional information about the distribution of farmsteads across the landscape. When Peebles conceived his site size – catchment productivity analysis, the available information indicated that most of the Moundville-era populace was nucleated at Moundville and the single-mound sites. The 1978–79 UMMA survey, however, demonstrated that the single-mound sites (except, possibly, 1 Tu 42/43) had relatively small resident populations. The bulk of the population outside of Moundville lived in dispersed farmsteads and small hamlets in districts or "neighborhoods" around the single-mound sites (Bozeman 1982). As yet, there is not sufficient systematic survey of the Black Warrior floodplain to determine how extensive these "neighborhoods" were. If the size of the occupation at single-mound sites is related to the productivity of the entire neighborhood rather than just the fields closest to the mound, then selection of a radius for a catchment analysis will be arbitrary and potentially misleading until there is further empirical guidance. Whether "neighborhood" productivity did in fact affect the size of the occupations around single-mound sites is a question not easy to resolve without better survey and some excavation data from the farmsteads. This does not mean, however, that all catchment analyses are potentially wrong or uninformative.

The question being asked of the catchment data is whether all sites had catchments which were equally likely to have permitted self-sufficiency in maize production. By dividing the catchment productivities by catchment size, we can remove the effect of differing catchment sizes. The resulting values are measures of intrinsic fertility of the soils near the sites. The mobilization model would predict a positive correlation between site size and intrinsic fertility, while the mobilization model does not predict any particular relationship between these two variables. Thus, a strong positive correlation would be

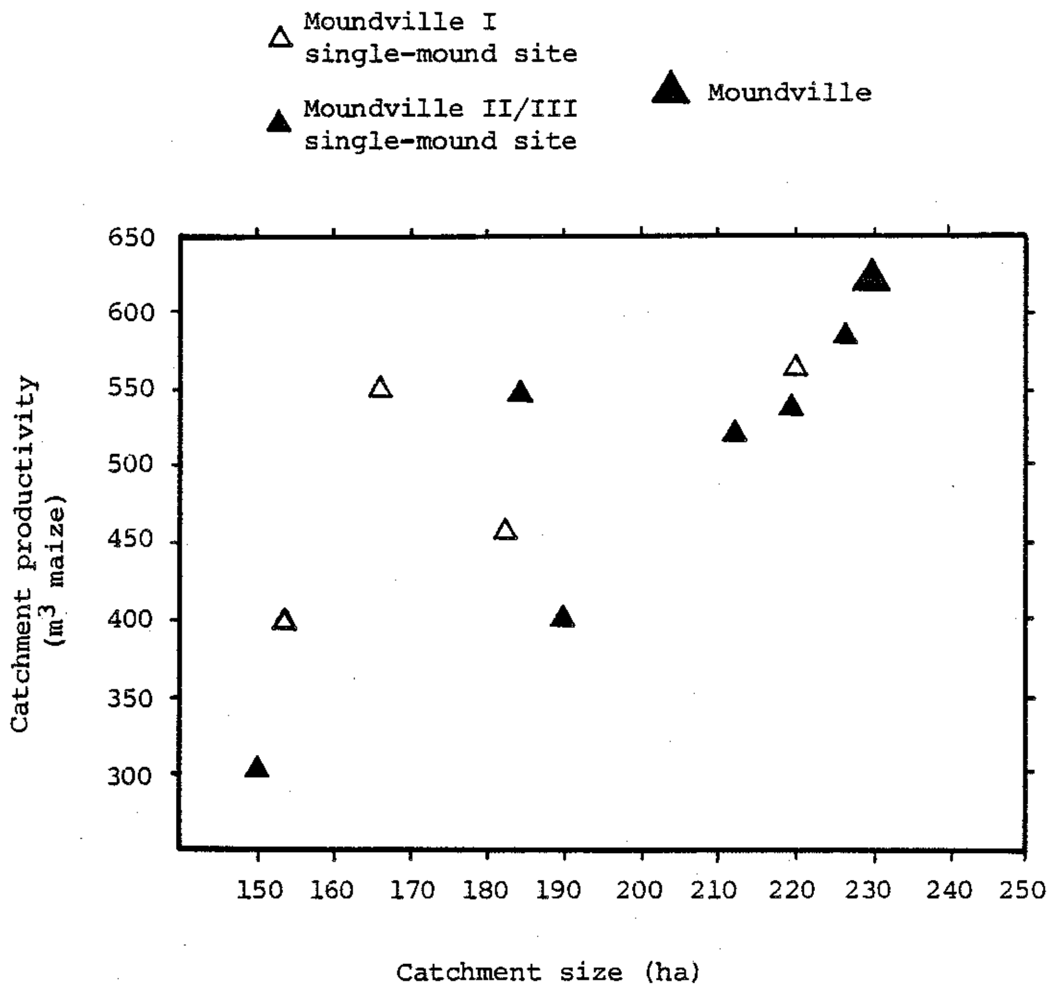


Figure 4.5

Scatterplot of catchment productivity versus catchment size, all mound sites

Table 4.13

Site size and catchment size, productivity, and intrinsic fertility for Moundville and Moundville III single-mound sites[1]

Site	Site size (ha)	Catchment		
		size (ha)	productivity (m^3 maize)	intrinsic fertility (m^3 maize/ha)
Moundville	112.5	230	621	2.70
1 Tu 2/3	.96	184	549	2.98
1 Tu 46/47	.28	190	401	2.11
1 Tu 42/43	2.2	150	304	2.03
1 Ha 14/15	1.3	219	544	2.48
1 Ha 107A	.60	212	525	2.48
1 Ha 7/8	.74	226	589	2.61

[1] From Bozeman (1982)

consistent with the mobilization model but would not be inconsistent with the redistribution model. The correlation between site size and catchment fertility for all Moundville III single-mound sites is low and negative ($r = -.28$, see Fig. 4.6). This result, however, depends on the accuracy of the size of 1 Tu 42/43, which is suspect. If 1 Tu 42/43 is omitted from the calculations, the correlation rises to $r = .57$. This is not statistically significant ($p = .31$), which is hardly surprising given the small sample size. (For this sample size the correlation coefficient must be .88 to be significant at $p = .05$). Considering the low power of the statistical test, I believe the data do show a meaningful correlation between site size and catchment fertility, despite the lack of statistical significance. The data do not contradict the expectation derived from the mobilization model.

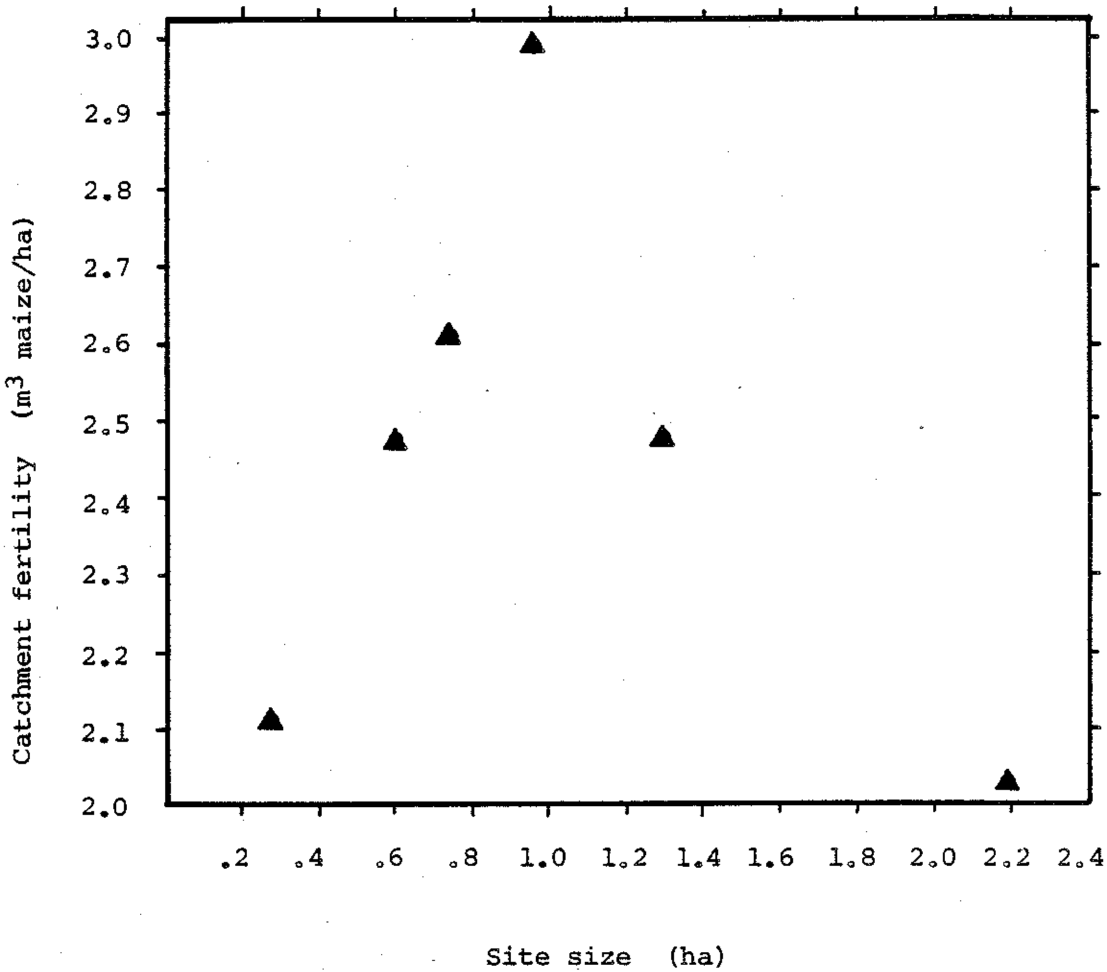


Figure 4.6

Scatterplot of catchment fertility and site size

The relationship between site size and catchment fertility for the Moundville site itself is very different from the relationship graphed in Figure 4.5. Moundville's catchment fertility is higher than all but one of the Moundville III phase single-mound sites (see Table 4.13), but the Moundville site is vastly larger than any of the single-mound sites. The Moundville site size listed in Table 4.13 includes the area of the plaza, which was devoid of residences (Peebles 1979). Even if the area of the plaza (roughly 30 ha) is subtracted from the estimated 112 ha extent of the site, Moundville still has a qualitatively different relationship to its catchment than do the single-mound sites. Given the large size of the Moundville site, it seems highly probable that Moundville residents directly exploited a catchment of considerably larger radius than did residents of the single-mound sites. It also seems likely that the <u>effective</u> catchment of Moundville included the entire chiefdom: using Steponaitis's (1978) spatial analysis technique, Bozeman (1982:291–301) showed that during the Moundville III phase Moundville is nearly optimally located to receive tribute from the single-mound sites and their districts.

<u>Maize Consumption at the White Site</u>

The intrinsic fertility of the catchment of the White site is relatively high (see Figure 4.6). This results from the frequent nutrient enrichment provided by flooding. Despite this fertility, the White site environs may have been less suitable for maize cultivation than the catchments of the other single-mound sites. As discussed above, the White site catchment is flooded more frequently than those of the other sites. Flooding frequently covers even the highest land within 1 km of the site, whereas most of the other sites are located on terrace-levees which are flooded only sporadically. Scarry (1986) has pointed out that with aboriginal cultivation techniques flooding is a far more likely cause of crop failure in the Black Warrior valley than drought. Table 4.14 shows the frequency of floods by month over a 77 year interval at Tuscaloosa. Nearly 20% of recorded floods occurred in April or May. Another way to express these data is that 39 floods occurred during April or May over a 77 year period, for an average of 1 flood in these months every 2 years. This means that most if not all of the White catchment would be inundated during the early growing season one year out of two. As Scarry (1986) noted, this would make maize cropping near the White site an unreliable mode of subsistence. Delayed planting, planting in hills, replanting after floods, and extensive above-ground storage might mitigate the effect of floods, but it can be questioned whether reliance on maize cultivated near the site would be a viable subsistence strategy.

Table 4.14

Frequency of floods
by month at Tuscaloosa, 1888–1960[1]

Month	No. of times above flood stage	Percentage of total number
January	36	18.2
February	39	19.7
March	55	27.8
April	27	13.6
May	12	6.1
June	2	1.0
July	3	1.5
August	0	0
September	1	.5
October	3	1.5
November	7	3.5
December	13	6.6
Total	198	100

[1] From Peirce (1962:44)

The degree of reliance on maize can be assessed from the charred plant food remains in the White site refuse deposit. Margaret Scarry analyzed the botanical material from three 6 liter flotation samples from the refuse deposit and four samples (total 9.75 l) of floor deposits. The wood charcoal and seed counts are presented above (Tables 4.11 and 4.12). Table 4.15 presents the data on maize and nuts. Data for individual flotation samples are presented in Appendix C. Due to the plethora of factors intervening between consumption of plant foods and their representation in the archaeological record (see Scarry 1986 for a review), the charred plant food data are meaningful primarily in terms of proportions relative to those found at other sites or from other times. Thus, while we cannot determine actual dietary abundances of plant foods from the charred plant remains, we can determine whether residents at White consumed more nuts and less maize than residents at other sites.

The only other archaeological plant food remains recovered from the Moundville chiefdom are from Moundville itself. Like the White site material, the Moundville material comes from flotation samples. Material from both sites was analyzed by Margaret Scarry, using identical procedures. Thus, the two sets of data are fully comparable. There are a variety of measures which could be used to examine the differences between the Moundville and White material. For example, we could compare the percentages of samples from each site which contain maize remains, or compare the percentages of total plant food remains which are maize (using either weight or count). The measures that I use are based on counts of pieces per liter of sample volume. Counts are used rather than weights since I compare maize remains with nutshell remains, which are much denser than maize cob fragments. The counts are divided by sample volume[1] since the flotation samples were of various sizes. Following Scarry (1986) I use medians to compare the two sites rather than means since medians are less affected by extreme outlying values. Both the median and mean values for maize and nut remains from White and Moundville are listed in Table 4.16, and the medians are compared in Figure 4.7. The vertical scale in this figure is the natural logarithm of the quantity one plus the median count per liter [i.e., ln(1 + median count per liter)]. The log transformation is used because of the large

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[1] Readers who wish to compare data presented by Scarry (1986) and those presented here should note that for most purposes Scarry standardized her sample values by total weight of plant remains per sample, rather than by sample volume. To facilitate comparison with Scarry's data, both the sample volumes and total weight of plant remains per sample for the White site samples are listed in Table 4.15.

Table 4.15

Counts and weights of maize, nuts, and nutshell from White site refuse and floor deposit flotation samples

Sample	Sample volume (l)	Plant weight (g)	Maize kernels		Maize cupules		Hickory		Acorn shell		Acorn meat	
			count	wt. (g)	count	wt. (g)	count	wt. (g)	count	wt. (g)	count	wt. (g)
Refuse deposit samples												
164N/105E L.1	6	1.52	15	.01	26	.06	64	.40	7	--[1]	1	--[1]
164N/105E L.2	6	9.54	45	.13	161	.79	99	1.05	116	.18	61	1.54
164N/105E L.3	6	13.74	39	.13	107	.31	179	1.83	350	.58	58	.79
Floor deposit samples												
164N/107E L.6	2	2.36	6	.01	16	.02	42	.49	185	.32	-	-
164N/107E L.7	1.5	3.14	3	--[1]	6	--[1]	151	1.25	127	.18	-	-
164N/107E L.8	3.25	5.76	12	--[1]	8	--[1]	166	2.56	204	.35	-	-
164N/107E L.9	3	5.34	26	.02	19	.03	195	2.89	92	.14	3	--[1]

[1] Less than .01 g

differences between the values from the two sites, and one is added to the site medians before taking the logarithm in order to avoid negative logarithms.

It is clear from Figure 4.7a that maize remains, hickory shell, and acorn shell are far more abundant at White than at Moundville. Acorn nutmeats are also more abundant at White than at Moundville, though the difference is not so great as for the other plant food remains. In part, the greater nut abundance at White is attributable to the nature of the excavated deposits. As an intentional refuse deposit, the White site refuse would be expected to have higher item counts per liter than the unintentional accumulations of sheet midden and pit fills from which most of the Moundville samples come. The accuracy of this expectation can be seen in Figure 4.7b, in which the White site refuse data are compared to Moundville sheet midden data. Even floor deposits from the two sites are not strictly comparable. The floors sampled at Moundville were carefully-laid deposits of clean sand which were frequently renewed (Scarry 1986), while the White site floor deposits have more the character of gradual, unintentional accumulations. As Figure 4.7c shows, the density of plant food remains in the Moundville floors is much lower.

While the absolute values of the medians are not strictly comparable between sites, the ratios of plant food remains should be. To compare the two sites in terms of the relative importance of nuts and maize, Scarry (pers. comm. 1986) suggests using the ratios of counts of acorn shell, hickory shell, and maize cupules. These data are presented as Tukey box plots in Figure 4.8. Tukey box plots are a convenient way of presenting information about data distributions (see Cleveland and McGill 1985:832 and references therein). The median of each distribution is plotted as a "+" enclosed in parentheses which show a 95% confidence interval for the median. The left and right sides of the open rectangle are, respectively, the 25th and 75th percentiles. The distance between these percentiles is called the midspread. Data points which are more than 1.5 times the midspread below the 25th percentile, or 1.5 times the midspread above the 75th percentile, are called outliers and are plotted as asterisks. The single horizontal lines extend from the

Figure 4.7

Median counts per liter for maize and nut remains
from White and Moundville flotation samples

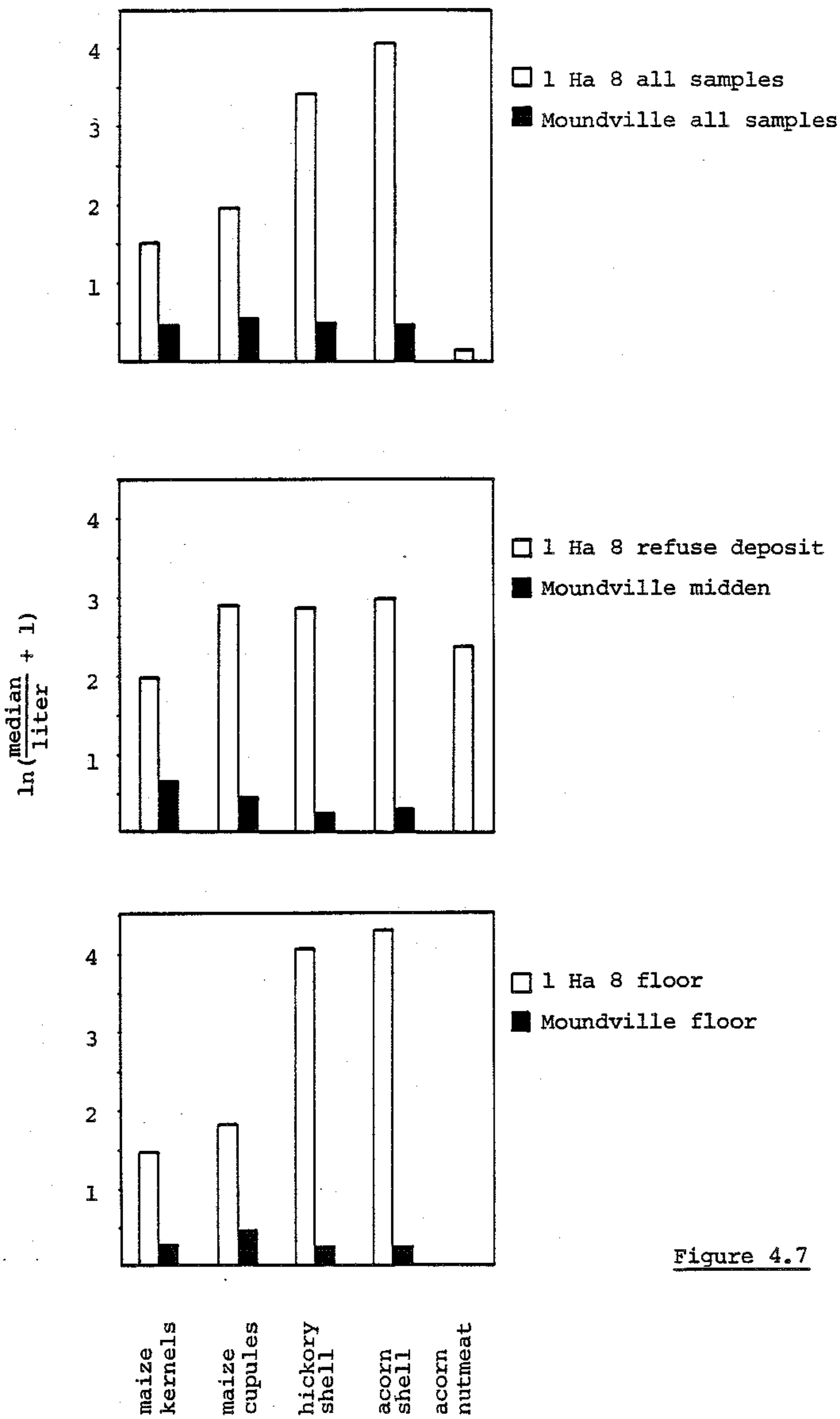

1 Ha 8 all samples
Moundville all samples
1 Ha 8 refuse deposit
Moundville midden
1 Ha 8 floor
Moundville floor
ln(median/liter + 1)
4
3
2
1
maize kernels
maize cupules
hickory shell
acorn shell
acorn nutmeat

Figure 4.7

Table 4.16

Mean and median counts per liter for maize and nut remains from White and Moundville flotation samples[1]

Context	Phase	No. of samples	Mean count per liter	Standard deviation	Median count per liter
Maize kernels					
White (all samples)	Moundville III	7	4.8	2.6	3.7
refuse	Moundville III	3	5.5	2.6	6.5
floors	Moundville III	4	4.3	2.9	3.4
Moundville (all samples)	Moundville I	103	1.4	2.2	.6
midden	Moundville I	26	1.5	2.1	1.0
floors	Moundville I	28	1.3	2.8	.3
Maize cupules					
White (all samples)	Moundville III	7	9.9	9.0	6.3
refuse	Moundville III	3	16.3	11.3	17.8
floors	Moundville III	4	5.2	2.4	5.2
Moundville (all samples)	Moundville I	103	1.3	3.5	.8
midden	Moundville I	26	2.2	6.6	.6
floors	Moundville I	28	1.1	1.6	.6

Table 4.16 (continued)

Context	Phase	No. of samples	Mean count per liter	Standard deviation	Median count per liter
Hickory shell					
White (all samples)	Moundville III	7	42.2	32.3	29.8
refuse	Moundville III	3	19.0	9.8	16.5
floors	Moundville III	4	59.6	32.9	58.1
Moundville (all samples)	Moundville I	103	.6	.9	.3
midden	Moundville I	26	.4	.3	.3
floors	Moundville I	28	.4	.4	.3
Acorn shell					
White (all samples)	Moundville III	7	50.0	34.0	58.3
refuse	Moundville III	3	26.2	29.2	19.3
floors	Moundville III	4	67.8	27.6	73.7
Moundville (all samples)	Moundville I	103	1.7	4.2	.6
midden	Moundville I	26	.6	.5	.4
floors	Moundville I	28	1.3	3.9	.3

Table 4.16 (continued)

Context	Phase	No. of samples	Mean count per liter	Standard deviation	Median count per liter
		Acorn meat			
White (all samples)	Moundville III	7	3.0	4.7	.2
refuse	Moundville III	3	6.6	5.6	9.7
floors	Moundville III	4	.25	.5	.5
Moundville (all samples)	Moundville I	103	[2]	.1	0
midden	Moundville I	26	[2]	.3	0
floors	Moundville I	28	0	0	0

[1] Moundville data from Scarry (1986)
[2] Under 0.1

central box to the furthest data points that are not outliers. The box plots in Figure 4.8 show that the acorn shell:hickory shell ratios at the two sites are roughly equal, but that at Moundville both kinds of nutshell are scarce relative to maize cupules. This suggests that nuts as a class were more important in the diet at White than at Moundville.

It is tempting to see the apparently greater reliance on nuts at White as resulting from the previously discussed problem of frequent flooding of the site's catchment. While this is one potential explanation of the data, there are at least three other possibilities:

1) While the samples from Moundville are thought to include materials deposited during all parts of the year (Scarry 1986), the White site faunal data do not rule out the possibility that the site was occupied only seasonally. Thus, the differing abundances of plant remains may be due to differing seasonality of occupation.
2) The contexts sampled at Moundville are nearly all at the north end of the site, in locations which were not commoner residential precincts (Scarry 1986). The White site refuse, in contrast, is thought to include refuse from commoner as well as elite households. Therefore, the differing plant data may result from status-related differences in dietary rules, preferences, or prerogatives.
3) The Moundville samples date to the Moundville I phase, while the White samples are from late Moundville III. Therefore, the differences may simply result from chronological change in the subsistence strategy. Caddell's (1983) data from the Lubbub site are relevant here. Unfortunately, differences between Scarry's processing methods and those of Caddell probably introduce biases which preclude direct comparison of their data. (Caddell identified remains retained on a 2 mm screen, while Scarry identified material retained on a 1.4 mm screen. Differences in the fragility and ease of identification of small pieces of nutshell compared with maize likely render Scarry's and Caddell's data non-comparable.) Caddell's data are relevant because she showed (1983) that Protohistoric (Summerville IV phase) samples had slightly higher nut:maize ratios than the earlier Summerville II/III

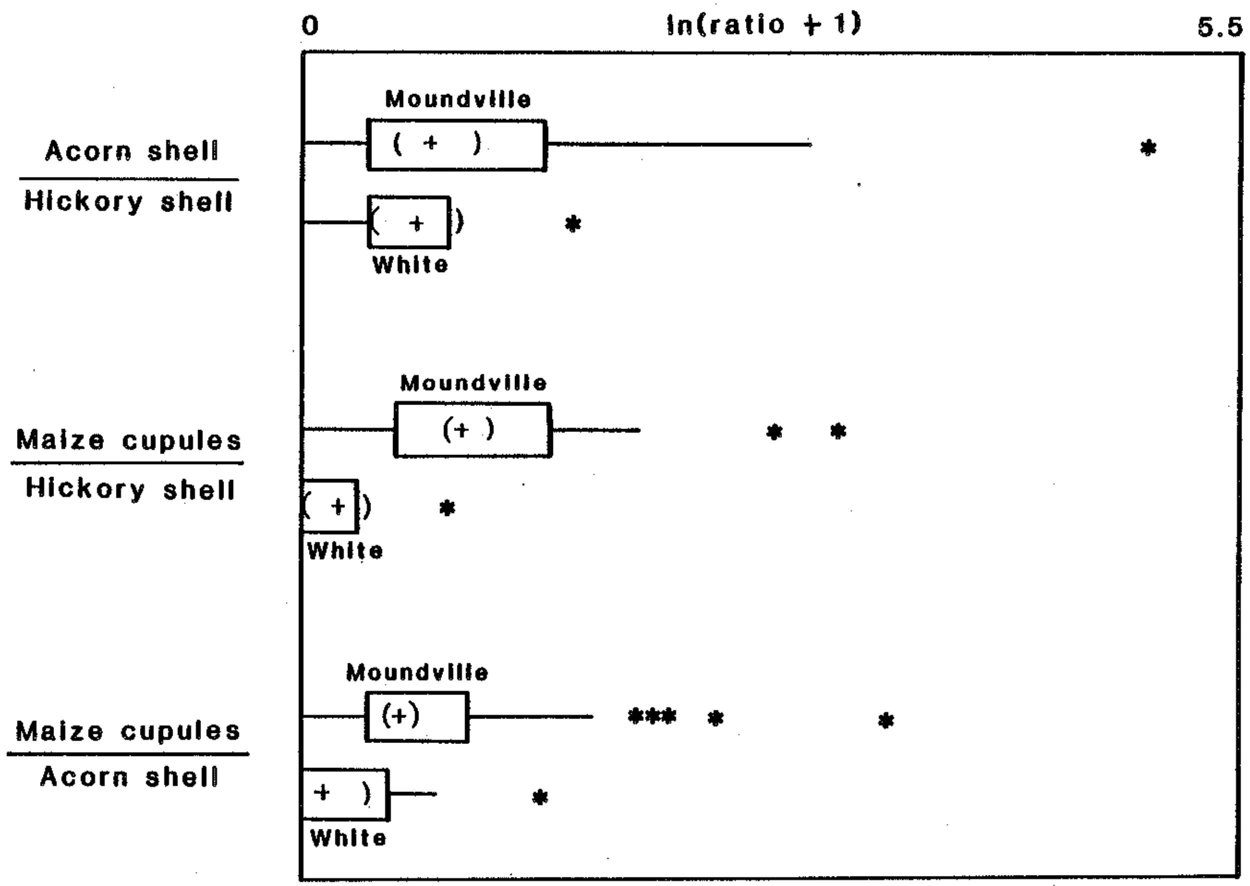


Figure 4.8

Box plot of acorn:hickory shell rations
for White and Moundville flotation smples.

samples. The White site data come from around the time this change was occurring at Lubbub. The differences between Caddell's and Scarry's analytic procedures make it difficult to determine, but the increased nut utilization in the Protohistoric at Lubbub does not appear to be as substantial as the difference between the late Moundville III White samples and the Moundville I samples from Moundville. Despite the apparent parallel between the Lubbub and White/Moundville data, a region-wide shift in subsistence strategy should be regarded as a possibility not yet securely demonstrated.

The last detail of the botanical analysis to be discussed is the representation of maize varieties at the White site. Using four morphological variables (row number, cupule height, cupule width, maximum cob diameter), Scarry (1986) performed a k-means cluster analysis on all available, measurable, Moundville-era and Protohistoric cobs from the Black Warrior valley. The four-cluster solution showed the clearest patterning by sample context and cluster definition. One cluster is distinguished by high row number ($\bar{x}$ = 12.5), and appears to represent a distinct variety of maize. It is present throughout the Moundville era and is found at White as well as at Moundville. (The measurable cobs from White came from two smudge pits, one radiocarbon dated to the Moundville II phase and the other of undetermined age.) The other three clusters appear to represent chronological stages in the evolution of Eastern Complex maize, with one cluster comprising primarily Moundville I samples, another comprising primarily known or probable Moundville II and III samples, and the final cluster comprising mostly Protohistoric samples. Most of the "Moundville II/III cluster" come from White. On this basis it can be concluded that both of the varieties of maize consumed at Moundville were also consumed at White.

Conclusion

The goal of this chapter was to determine whether there were patterned differences between sites of the Moundville chiefdom either in potentially available subsistence resources or in the foods actually consumed. Catchment analyses indicate that the single-mound sites of the Moundville chiefdom were in very similar locations. All would have had direct access to the same set of wild food resources, and the positive correlation between intrinsic fertility of the catchments and size of the occupations is consistent with these sites being agriculturally self-sufficient. One site, 1 Tu 42/43, seems to be an exception to the fertility – occupation size correlation, but the estimated size of the site is likely to be erroneous. The White site has a catchment significantly more flood-prone than the others, which may have made maize cultivation there less dependable. Maize remains were in fact less abundant relative to nutshell at this site compared to the botanical remains from Scarry's excavations north of Mound R at Moundville. Scarry's data, however, are from an earlier time, probably from households of a different social status, and possibly not from the same season(s). Thus, it is not clear whether the relative abundance of nutshell at White results from reliance on nuts to buffer shortfalls in maize production, or whether other factors are involved. In summary, the botanical and catchment data provide no reason to suspect any of the single-mound sites appreciably depended on non-local plant foods.

Occupants of the single-mound sites would have had direct access to the same faunal resources. Faunal remains from White are similar in overall composition to those from other Mississippian sites in west Alabama. That is, all the communities from which data are available seem to have consumed nearly identical proportions of fish, fowl, deer, small mammals, etc. There are, however, marked differences between sites in terms of the portions of deer that are consumed. A farmstead (Yarborough) and a single-mound site (Lubbub) along the Tombigbee River had complementary patterns of enrichment (single-mound site) and depletion (farmstead) of the meatiest parts of a deer carcass. This pattern is interpreted as evidence of provisioning of the elite at the single-mound site. The upper fore limb in particular seems to have been preferentially consumed by the elite. Unfortunately, White is the only site in the Moundville chiefdom from which an adequate faunal sample is available. The White site deer remains have a greater than expected proportion of upper hind limb elements, but a lower than expected proportion of upper fore limb. Several possibilities may account for this pattern, among them:

1) In contrast to the central Tombigbee valley, in the Moundville chiefdom the upper hind limb may have been the portion preferentially consumed by the elite.
2) Upper fore limbs may have been preferentially consumed by the elite at White but the bones were not discarded in the refuse deposit sampled in 1983.
3) As the most preferred portion of the deer, upper fore limbs may have been sent to the higher-ranking elite at Moundville.

Until adequate faunal samples from Moundville and from farmsteads or hamlets are available, it is difficult to determine what accounts for the patterning in the White site faunal data. Tentatively, however, it appears that deer meat was being moved between sites of the chiefdom. The movement does not appear to be bulk redistribution to the populace at large, but rather the provisioning of elite persons with preferred cuts of meat.

CHAPTER V

CRAFT PRODUCTION

Introduction

The production of non-subsistence goods is examined in this chapter. Rather than repeating the cumbersome term "non-subsistence goods", I will use the term "craft items." In common usage, this term carries connotations about the mode of production and visual attractiveness of the items, so that we think of a craft item as something produced by an individual artisan that a tourist or a museum might like to buy. Such connotations are not implied in my use of the term. This point is important, since connotations about the mode of production would prejudge the issue being examined.

As with subsistence goods, the several models of chiefdom economies specify different patterns of craft production. The redistribution model specifies that the districts composing a chiefdom differ in their production of utilitarian crafts, i.e., cooking utensils, clothing, and agricultural and hunting implements. The mobilization model specifies that each district is self-sufficient in these goods. The tributary model places much of the production of prestige goods in settlements other than the paramount center. The prestige goods model puts such production either at the paramount center or outside the chiefdom. These predictions are compared below with data from the Moundville chiefdom.

Before proceeding to the analysis, however, it is necessary to describe the severity of the problem posed by the non-preservation of organic materials. Aside from a few objects preserved by waterlogging, charring, or by copper salts in burials at Moundville, there is no preserved fabric, leather, cordage, cane or wooden objects, nor basketry, and bone tools are probably underrepresented due to poor preservation. These are major deficiencies in the data, since they include all clothing and most of the tools used to make it, most of the agricultural, fishing, and hunting gear, and the wooden mortars in which maize was pounded for the daily meals (cf. Swanton 1946:439–608). Such deficiencies in the data base are, of course, common in the archaeological record, and several procedures have been devised to bridge the resulting gaps. Catchment analysis, for instance, can reveal whether raw materials for the non-preserved items were locally available. Another approach is to examine the production of non-durable items by studying the durable tools used in their fabrication. Such tools and other durable crafts are examined here after a brief consideration of site catchments.

As the previous chapter shows, the settlements composing the Moundville chiefdom had catchments with similar biotic resources. Faunal and botanical materials used for clothing (e.g., deer hides, mulberry bark), hide-working tools (e.g., deer metapodial scrapers, bone needles), cordage (e.g., deer sinew, squirrel hide), mats and baskets (e.g., rushes, cane), and household utensils (e.g., wooden dishes, knives of cane, wooden mortars and pestles) would have been equally available to all the settlements. Furthermore, the sites do not differ in the accessibility of the raw materials for durable craft items such as pottery and stone tools. Clays suitable for pottery, and which apparently were used for pottery at Moundville (Steponaitis 1983a:18–20), crop out from Tuscaloosa at the north to just south of the White site (Clarke 1966, 1970). The predominant material used for chipped stone tools is pebble chert and quartzite from the Tuscaloosa sand and gravel formation. This formation blankets the Fall Line Hills from above Tuscaloosa to below the White site, and derived gravels can also be found in stream beds leading from the hills and in Pleistocene alluvium in the river floodplain itself. The two other lithic materials used for domestic implements are greenstone (for axes) and a brown siltstone from which hoes that may date to the Moundville period were sometimes made. The siltstone is actually just floodplain silts cemented with iron and manganese oxides, and can be found all along the banks of the Black Warrior River. Greenstone—more precisely, chlorite schist and other closely related fine-grained metamorphics—crops out in eastern Alabama (Jones 1939). Since the nearest outcrop is over 100 km east of Moundville, all the Moundville communities were essentially equally distant from the stone source. There is, therefore, no obvious geographic disparity in animal, vegetal, or mineral resources that might encourage communities to specialize in different crafts.

Ethnographically, however, community craft specialization often has little obvious relation to the distribution of raw materials. Thus, to be confident that communities or districts of the Moundville chiefdom did not have different craft specializations, we must rely on the archaeological record of craft production. Data from the subsidiary sites come from excavations at White and systematic surface collections from the other single-mound sites. From Moundville itself there are two classes of information: systematically collected and analyzed artifacts from excavations directed by Margaret Scarry in 1978–79; and information gleaned by Christopher Peebles from the records of excavations prior to 1951. Since the recovery of artifacts from these latter excavations was not systematic, i.e., screens were not used, the information derived from them must be treated as qualitative rather than as quantitative data.

Ceramics

Since potsherds are the most abundant artifacts at archaeological sites of the Moundville chiefdom, ceramic production is the first craft to be analyzed. Steponaitis studied technological and functional aspects of Moundville pottery and described the ceramics as follows (Steponaitis 1983a:33):

> Moundville pottery can be divided into two broad groups, which differ from each other in both function and paste composition. One group consists mostly of bowls and bottles that were used as eating and storage vessels, but were not used for cooking. Typically, these non-cooking vessels are tempered with finely ground shell, and have a dark surface finish produced by deliberate smudging and reduction during firing. Indeed, the fact that most of them are "black-filmed" implies that they were not used for cooking, because contact with a cooking fire would have oxidized the surface and made it lighter.

> The second group, the cooking ware, consists of unburnished jars. These vessels, in contrast to the noncooking wares, are usually tempered with coarse shell, and tend to have an oxidized, reddish brown surface color consistent with what one would expect on a vessel used over a fire.

Steponaitis (1983a:33–45) showed that the mechanical properties of these two wares were consistent with his functional designations: initially the cooking ware is not as resistant to mechanical shock as the serving/storage ware, but does not deteriorate as quickly when exposed to rapid heating and cooling (thermal shock, such as a cooking vessel undergoes).

One of the goals of Peebles's Moundville research program was to determine whether pottery was produced by craft specialists, and what role chiefly control of its production may have had:

> It has been proposed (Peebles and Kus 1977) that one of the major areas of craft specialization in chiefdoms was the manufacture of ceramics. If either part or all of the pottery production at Moundville was in the hands of such specialists, then the limited number of artisans should be reflected in the stylistic, morphological, and technical variability of the pottery. In addition, if part or all of the pottery production was removed from the context of the individual household, then the kilns and other remnants of the manufacture of ceramics should be localized within the site. Finally, if the complex social organization known to exist at Moundville developed there through time, and if specialized production of ceramics is associated with such development, then there should be a reduction in the variability of ceramics and a trend to the localization of pottery production within the site through time. (Peebles 1978c:4)

While these propositions cannot yet be tested definitively, there is evidence bearing on each. First, there is both technological and stylistic evidence that part-time craft specialists were indeed making some of the Moundville pottery. The technological evidence consists of van der Leeuw's (1979, 1981) and Hardin's (1979,1981) identification of a highly efficient, skillful technique for fabricating fine-ware vessels. Beginning with vessel fabrication by adding coils to a basal slab supported on a rest, the technique progressed by increasing the fraction of the vessel formed on the rest. By the late Moundville II and Moundville III phases some vessels were being made in molds. A subglobular bottle, for instance, would be made by forming the lower half of the vessel body in a hemispherical mold, forming the upper half in the same or a similar mold, cutting out from the upper half a hole for the insertion of the bottle neck, attaching the upper and lower hemispheres, and attaching a slab-built cylindrical neck. In contrast, cooking vessels were made by coiling with paddle-and-anvil finishing. In comparing the two techniques, van der Leeuw (1981:107) says of the mold technique:

> It seems as if this technique in particular was in the hands of specialists. There was a considerably higher degree of skill involved, and a much greater volume of information processing was required, especially when decoration was added to the vessels.

Stylistic evidence of ceramic craft specialists is provided by Hardin's (1979, 1981) analysis of decorated fine-ware vessels. Assisted by Steponaitis, Hardin identified sets of vessels decorated by individual artisans, by looking for (nearly) identical attributes of motif selection, choice of structural options in rendering the motif, and technique in executing the motif. Because all three variables must be considered, individual "hands" cannot be identified reliably across different vessel shapes or across different varieties in the Moundville type-variety typology (varieties by definition have different motifs). Hardin identified 12 sets of vessels, and less certainly an additional 4 sets, where each set was decorated by a single individual (Table 5.1). Six sets were identified for Moundville Engraved var. Hemphill, one set definitely and three less certainly for var. Taylorville, one set for var. Wiggins, two definitely plus one less certainly for var. Tuscaloosa, one set for var. Northport, and one set for Carthage Incised var. Carthage. While these sets were identified solely on stylistic grounds, "independent corroboration of the stylistic identification of sets by the same hand was provided by similarities of vessel form, surface texture (probably reflecting clay, surface treatment, and firing conditions), and building technique used for the vessel bodies" (Hardin 1981:110). Since the patterns of fabrication and of decoration appear to be wholly redundant, I refer to these sets of vessels as being produced by a single potter. This is merely for convenience, since the data do not indicate how many people were involved in the production of each set, but only that each set came from the same workshop.

Table 5.1

Sets of vessels from Moundville decorated by individual potters
(M. Hardin, pers. comm.; Steponaitis, pers. comm.)

Type *variety*	No. of vessels in sample	No. of unmatched vessels (% of total)	Catalog numbers of vessels by set (each row is one set)
Moundville Engraved *Hemphill*	138	124 (89.9)	SD1/M7; SD6/M7 NR30/M5; SD34/M7; WR81 SWM15A/M7; SD58/M7 09/M5; SD71/M7; WR8/M7 RW878; NN'18 SD44/M7; SD87/M7
Moundville Engraved *Wiggins*	47	38 (80.9)	Rho102; Rho304; SED6; SED34; SD96/M7; EE9; EE86; EE136; SWM220
Moundville Engraved *Taylorville*	28	15 (53.6)	Rho66; SD10/M5; NE8; EE429; EI15; SWM183 (probable set) WR9; NE133; EE133 (probable set) WR60; SE3 (probable set) Rho364; Snow6
Moundville Engraved *Tuscaloosa*	21	15 (71.4)	NE572; SE13 Rho440; SL25 (probable set) 014/M5; SD841
Moundville Engraved *Northport*	16	13 (81.3)	C17/M5; <M>17/3348; WP119
Carthage Incised *Carthage*	19	17 (89.5)	WP83; WP85

To gain an idea of the quantitative contribution of these individual potters (or fabrication-decoration workshops), we can compare the number of vessels decorated by individual hands with the number of vessels from which the sets were identified. This information is presented in Table 5.2. A measure of the statistical significance of these quantities, given the sample sizes, is possible using the null hypothesis that each one of K potters produced 1/K of all pots. Under this hypothesis we would expect only 1/K of the pots in a random sample to have been made by a single potter. Since we do not know how many potters there actually were at Moundville, we can conservatively estimate K by the number of potters observed in the sample, or k. The actual number of potters was certainly higher than this estimate, and the higher the value of K the less likely it would be to find a large set of pots made by a single potter. Thus, if we can reject the null hypothesis using $K = k$, we can be even more confident that the null hypothesis would be rejected if we knew the true value of K. For each of the varieties, we can use binomial theory to determine the likelihood of obtaining the largest single set, given the sample size and given the null hypothesis estimate that 1/k of the pots in the sample were produced by a single potter. (Actually, for Moundville Engraved var. Hemphill and var. Wiggins the sample sizes are large enough that it is appropriate to use a test for difference of proportions using the normal distribution.) Results of the tests are presented in Table 5.2. For three of the varieties we can reject the null hypothesis at the .05 level.

These test results suggest that some potters made more pots than others. In interpreting these results it should be recalled that for three of the five varieties there is more than one identified set, and the tests only determine the probability of obtaining the largest set. Further, the extreme conservativeness of the assumption that $K = k$ should be pointed out. Peebles (Peebles and Kus 1977:435) estimated the population of Moundville during the period when these pots were made as over 1000. If each household consisted of 5 individuals and each household produced its own pots (i.e., no craft specialization), then at any one time there would have been at least 200 potters. The pots

Table 5.2

Data for testing the likelihood of non-specialized production of vessels of six varieties at Moundville

Type variety	No. of vessels in collection	No. of identified potters	Expected % of pots per potter	Largest no. of pots by one potter	% of total pots by one potter	Significance level
Moundville Engraved Hemphill	138	130	0.77	3	2.17	.029[1]
Moundville Engraved Wiggins	47	39	2.56	9	19.15	.002[1]
Moundville Engraved Taylorville	28	19	5.26	6	21.43	.003[2]
Moundville Engraved Tuscaloosa	21	18	5.56	2	9.52	.219[2]
Moundville Engraved Northport	16	14	7.14	3	18.75	.078[2]
Carthage Incised Carthage	19	18	5.56	2	10.53	.200[2]

1 Test for difference of proportions, normal distribution
2 Binomial test

were produced over a period of at least 200 years, or roughly 10 generations of 200 potters per generation. Compared to these estimates, the estimates of K used in the tests are extremely conservative, hence the actual probability of observing such large sets of pots from a single potter should be far lower than the values in Table 5.2.

On these grounds we can conclude that, unless cultural or natural factors have strongly biased our recovery of whole pots, a limited number of potters produced a disproportionately large number of fine-ware vessels. The latter case, of course, would effectively indicate craft specialization of some degree. I can think of no natural factors which would result in the overrepresentation of the pots of only a few pottery workshops. Nearly all the recovered vessels are from burials, so different contexts of deposition would not account for the observed abundances. Two cultural factors might be of importance, however. The disproportionate representation of a few potters' products in burials might not be due to differential productivity between potters, but due to strong biases in which potters' vessels were selected for inclusion in graves. The best way to assess this possibility would be to compare the pottery from domestic refuse deposits with that from the burials, a task made difficult by the near absence of whole vessels from refuse contexts. Short of this, it should be noted that the vessels in graves are not mortuary vessels per se. Extensive abrasion and chipping on the base and lip indicate that many of these vessels received protracted use before being interred, just as midden sherds of the same vessel types reveal traces of use. If there were a systematic selection of certain potters' pots for inclusion with burials, would we expect these pots to have undergone the same use-history as other potters' pots? Rather than attempting to answer this question, it seems safer to allow the issue of differential production versus differential selection for burial to remain unresolved until a direct comparison of burial and domestic-refuse pots can be made.

The other cultural factor which might account for the observed abundances of vessels produced by a few individuals is that often more than one pot was found per grave.

If all or most of the vessels from each identified set had come from a single grave, then there would be little basis for inferring specialist potters. The gravelots might simply contain domestically produced pottery. This is not the case, however; no two vessels of any one set came from the same grave, nor is there even much spatial clustering of the pots in the sets. Pots of a set are as likely to be found on opposite sides of the site as they are to be on the same side. Moreover, two vessels of one set of Moundville Engraved var. Taylorville were found at different sites, one at Moundville and the other at 1 Tu 2 (Snows Bend), a single-mound site 20 km north of Moundville. Except for the unresolved issue raised in the previous paragraph, no identifiable factor other than some form of craft specialization accounts for the observed data.

As noted above, Peebles (1978c:4) inferred that specialization in pottery production ought to result in kilns or other remnants of the manufacture of ceramics being localized within the site. While no unambiguous kilns have been found at Moundville, there is a set of six large, irregularly shaped, fired areas in a small zone west of Mound P (see Fig. 5.1; Peebles 1979:817–825). Most of these were outside of any walled structure, and those apparently within walls may be superpositions. Only three of the areas were associated with prepared, basin-shaped hearths, which is the standard form of hearth at the site. The fired areas are not just incidental burning around domestic hearths, however, since one of the areas associated with a hearth was 5.7 x 1.2 m and the firing extended 15 to 25 cm deep. No such large fired areas have been described elsewhere at the site with the possible exception of "flat fire places, one at least having clay hardened like brick from continued heat" north of Mound R (Moore 1905:221). While Moore distinguished these "fire places" from the basin-shaped hearths typical at the site, no information about their size was provided. The fact that the only strong candidates for pottery firing areas at Moundville were located within a few dozen meters of each other is particularly striking, considering that roughly 5 ha of the site has been excavated.

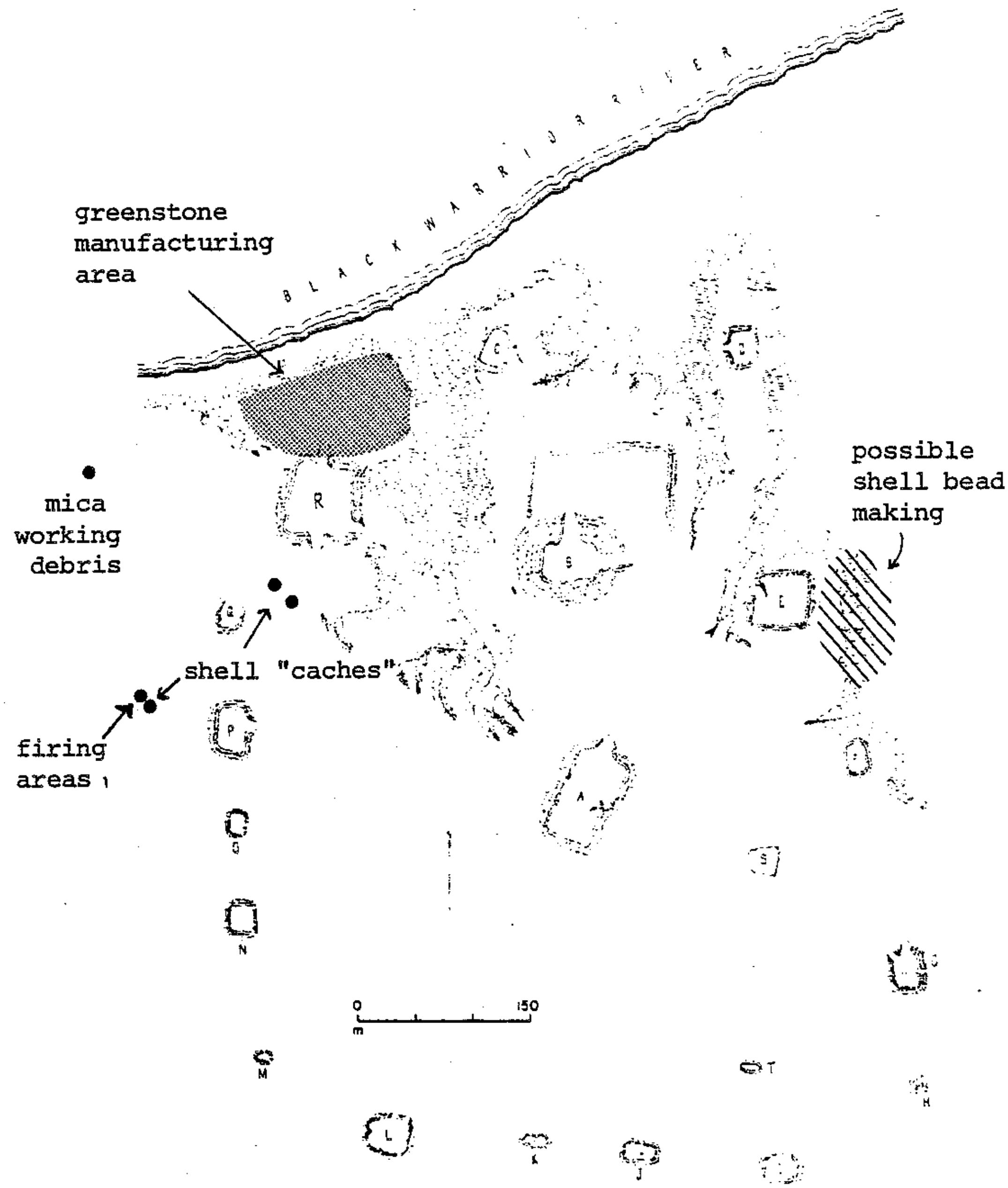


Figure 5.1

Location at Moundville of features related to craft production

One other line of evidence about the localization of pottery production within the Moundville site is the distribution of "caches" of clay and mussel shell. These are the raw materials for pottery. Aside from "two bags" of a clay and crushed shell mixture recovered east of Mound E (Peebles 1979:298), all clay and shell caches were found west of the plaza (see Fig. 5.1). Most of these were within 100 m of the firing areas, though another set was some 200 m to the northeast (south of Mound R). While the clay-shell mixture from east of Mound E is almost certainly raw material for pottery, caches of clay or shell alone are not necessarily related to ceramic production. Clay is also used as daub for structure walls, and mussel shell is a food byproduct. In light of the uncertain relation of these caches to pottery production, and their rather diffuse association with the firing areas, I regard this line of evidence as weak support for the presence of pottery specialists at the site.

In contrast to the case for Moundville, there is little available information about the presence and organization of ceramic production at the outlying sites. Some pots were made in at least one of the single-mound sites, because the 1932 AMNH burial excavations at the Snows Bend site (1 Tu 2,3) encountered a "nice bowl in kiln" (original field notes, quoted in DeJarnette and Peebles 1970:107). The bowl was held fast in an area of fired clay, about which no further details were recorded. Since the excavators were already familiar with the standard Moundville basin-shaped hearth, their use of the term "kiln" suggests this feature was not a hearth. There is every reason to believe that the excavators' functional interpretation was correct (though "firing area" might be a more apt term than "kiln"). A burial at this site also contained one vessel of a pair identified by Hardin (1981) as decorated by the same artisan; the other vessel of the pair was found at Moundville. On these grounds we can conclude that some pots were made in at least one of the single-mound sites, and that some potters or finished pots moved between this site and Moundville.

However, information on the extent of pottery production at Snows Bend and the other single-mound sites is not available. While identification of the products of individual potters can in principle be done with sherds (Hardin 1979), such analysis is not feasible with the available samples. The surface collections from single-mound sites are so extensively fragmented as to preclude useful results. The excavated sample from the White site is of such late date that the fine-line incised (so-called engraved) designs principally used by Hardin are no longer part of the decorative repertoire. Similarly, the use of molds for vessel-forming, which appears to figure in the development of specialization of pottery-making at Moundville, is most easily detected on whole vessels, particularly on subglobular bottles. Subglobular bottles were no longer being made during the time the White site midden and refuse deposits were formed (see Chapter III; Steponaitis 1983a:Fig. 26). Some of the hemispherical bowls and short-neck bowls at the White site may have been mold-made: shoulders of short-neck bowls are often broken evenly at the point of vertical tangency where shoulder meets lower body, a fracture pattern common among mold-made jars. This pattern is not diagnostic of the use of molds, however; the point of vertical tangency on short-neck bowls is often rather angular and is thus mechanically weaker, hence more prone to breakage, than the smoothly curved upper and lower body walls. Fracture at this inflection point would be common irrespective of the technique of vessel construction.

To summarize, ceramic samples from the outlying sites are either too fragmentary or of the wrong period to determine how they relate to the specialization of pottery production at Moundville, and the extent of excavation at the outlying sites is not sufficient to reveal the extent and organization of pottery production there. At Moundville itself, the abundance of vessels produced by a small number of individuals indicates there were a limited number of potters during late Moundville II and Moundville III times. The use of a highly efficient vessel-forming technique for certain classes of vessels during this period is consistent with the rapid production of a large number of these vessels by a few individuals. Extensive excavation at the Moundville site has revealed what appear to be pottery firing areas in only one very small portion of this large and populous site. This strongly supports the conclusion that during late Moundville II and III times a disproportionate fraction of the community's pots were produced by a small number of individuals. Finally, to prevent confusion on this issue (cf. Muller 1984, 1986; Yerkes 1986), I emphasize that I make no claim as to whether these potters were full-time specialists or only part-time specialists; I merely argue that there was some specialization of pottery production.

Stone tools

In Chapter III it was mentioned that surface collections from subsidiary sites of the Moundville chiefdom had lithic assemblages containing high proportions of material from other time periods. To gain an idea of how high these proportions are, the ratio of Moundville-era sherds to the total number of sherds can be used as an index of mixing. The surface collections from occupation areas at single-mound sites have between 4% and 67% Moundville-era sherds (Bozeman 1982). Even if the mixture of lithics were no worse than these figures, it would be difficult to extract useful information from these assemblages.

However, there is reason to suspect that the actual percentage of lithics dating to the Moundville period may be much lower than the sherd ratios. In most cases, the principal non-Moundville-era ceramics at these sites are of Late Woodland age (West Jefferson phase—AD 850 or 900 to 1050). In the excavation contexts at White that have nearly pure West Jefferson ceramic assemblages, there are 3 to 5 times as many lithics (all stone including debitage) as sherds. In the least-mixed Moundville-era deposits at White, there are 3 to 5 times as many sherds as lithics. If we assume that these excavation contexts are representative of the other West Jefferson and Moundville components, then a simple calculation indicates that none of the surface collections should have lithic assemblages that contain more than 20% Moundville-era lithics. The situation may not be this severe: leaching of the shell tempering from Moundville-era sherds leaves them significantly weaker than the grog-tempered West Jefferson phase sherds, and hence much more prone to weathering and mechanical destruction in plowed fields. Thus, the sherd ratios from plowed fields collected by the 1978–79 UMMA survey probably misrepresent the sherd ratios prior to plowing. While the direction of this bias is clear, its magnitude is not known. Overall, then, there is no obvious way of extracting information about Moundville-era use of lithic resources from surface collections that are largely, if not mostly, composed of material of other time periods.

Not only does this conclusion apply to debitage and informal tools, but it also applies to formal tools which might ordinarily be expected to differ in shape between periods. The principal formal tool type—a small triangular projectile point—was used throughout west Alabama in both the Moundville period and the preceding Late Woodland period. Comparisons of points from known-age contexts have not identified patterned morphological or technological differences between periods (Ensor 1981; Allan 1983). Other formal stone tools exist, including drills, gravers, celts, and hoes. Researchers in west Alabama have some knowledge about the temporal distributions of these tools, but this is far from complete. Ground and polished greenstone celts definitely were used during both the Moundville period and the preceding Late Woodland, since they are present in well-dated excavation contexts (Jenkins and Nielsen 1974; Jenkins and Ensor 1981; Moore 1905, 1907; DeJarnette and Peebles 1970; Scarry 1986; unpublished field notes on file at Mound State Monument). There are two forms of drills which may date to the Moundville period: reworked projectile points, and cylindrical drills. None of the cylindrical drills have been found in clear Moundville contexts, and I suspect them to be of Late Woodland date. They are currently being studied by Melody Pope at SUNY-Binghamton, who should be able to provide further information on their function and possibly their cultural affiliation. A few drills made from resharpened projectile points, as well as a few gravers or piercing implements, were recovered from the late Moundville III trash deposit at the White site, though most such tools at the site came from mixed midden primarily of Late Woodland origin. It would be premature to conclude that such tools were definitely used in the Moundville period. Another class of stone tool found in the surface collections is a large siltstone implement thought to be a hoe blade (M. Pope, pers. comm.). Since none of these tools have yet been found in excavations, their dating is an open question.

So far this discussion has emphasized the difficulties of extracting useful information from the stone tool assemblages. Despite these difficulties, it is possible to draw a fairly clear picture of the use of lithics in the Moundville period. The rest of this discussion focuses on the evidence which leads to the following conclusions:

1) Most cutting tools were not made of stone.

2) Most tools made of chipped stone were made of locally available materials.

3) Tools made of non-local stone (either ground or chipped) were made primarily at Moundville.

There are two lines of evidence that most cutting tools were not made of stone. First, as has been stated above, stone tools and debitage are infrequent at sites of the Moundville period in comparison with earlier sites (using lithic counts standardized by sherd counts). This appears to hold true regardless of the level of a site in the Moundville settlement hierarchy. Surface collections from small, sparse sherd scatters interpreted as isolated farmsteads had roughly three times more sherds than lithic items (Bozeman 1982:Table 29). In the least mixed Moundville-era deposits at the White site, the ratio was three to one or higher. In excavations north of Mound R at Moundville, the sherd:lithic ratio was much higher, 38 to 1. In contrast, in the least mixed West Jefferson phase contexts at White, the sherd:lithic ratio was 0.3 to 1, or lower. Surface collections at single-component (ceramically) West Jefferson phase sites in the upper Black Warrior drainage had sherd:lithic ratios below 0.1 to 1 (Jenkins and Nielsen 1974).

Caution must be used in comparing these data, since some are from surface collections while others represent remains retained on screens. The screened samples include all lithics retained on 1/4 in screens and all sherds retained on 1/2 in screens. I suspect that surface collections, like the screened samples, are biased against small sherds more than against small lithics. Thus, I suspect the sampling techniques yield roughly comparable data. There are also problems in comparing the screened samples. The deposits north of Mound R at Moundville are structure floors and incidental midden layers, while the Moundville-era deposits at White are intentional refuse deposits. The different formation processes may bias the sherd:lithic ratios, though which way and how severely is not known. A further complication is that these figures include <u>all</u> lithics, not just formal cutting tools. It appears that during both periods compared here there was extensive expedient use of unmodified flakes for cutting (M. Pope, pers. comm.), though the samples have not been studied to determine whether such expedient use is equally common in the two periods. Notwithstanding these complications, the consistent difference between the West Jefferson phase and the Moundville-era data, and the fact that this difference spans two orders of magnitude, are here taken as evidence of the relative infrequency of stone tools in the Moundville era.

A second line of evidence that stone tools were not the most common cutting tools in the Moundville era consists of ethnohistoric descriptions of tool use in the Southeastern U.S. Swanton (1946:564) summarized this evidence briefly:

> Undoubtedly knives of shell, stone, and perhaps bone were employed, but cane or reed knives are the only aboriginal implements of this kind to be widely noted. They appear to have been in use everywhere throughout the [Southeast].

Swanton (1946:571–584) also reviewed early European descriptions of arrowheads and lance points, among which cane tips were mentioned frequently.

The chipped stone tools that <u>were</u> used during the Moundville era were predominantly made of locally available raw material. Table 5.3 lists the raw material types of all retouched pieces from the late Moundville III refuse deposit at the White site.

For 86% of these items the raw material is locally available. The predominance of local raw materials is also seen in the debitage, of which 96.6% by count is chert or quartz from the Tuscaloosa gravels and only 3.4% is non-local material.

The problem of chronological admixture of the lithics in the refuse deposit at the White site, mentioned in Chapter III, is underscored by the fact that 2 out of the 14 (14%) diagnostic projectile points are pre-Mississippian (i.e., the Late Woodland Flint River Spikes; Cambron and Hulse 1975:53). While the refuse deposit data presented here all come from excavation units with 10% or less pre-Mississippian ceramics, some of these units are less mixed than others. This allows us to determine whether the admixture of earlier material is "masking" a usage of non-local stone higher than the summary statistics for the debitage indicate. If the late Moundville III usage of non-local stone was proportionally greater than in earlier periods, there should be a negative correlation between the percentage of pre-Mississippian ceramics and the percentage of non-local debitage. Table 5.4 presents these percentage values for all those refuse deposit analytical units in which the number of sherds and the number of debitage pieces is each greater than 30. This cut-off value is used to prevent the relatively high sampling error expectable for small samples from obscuring any real relationship. As can be seen by the least-squares regression line fitted to the data in Figure 5.2, there appears to be a positive relationship between these variables. While the correlation is not significant ($r = .34$, $p = .14$), these data do indicate that admixture of earlier material more likely elevates the proportion of non-local debitage than reduces it. No more than a few percent of late Moundville III debitage was non-local material.

A technological analysis of the White site debitage indicates that all stages of the lithic reduction sequence for locally available raw material took place there. Table 5.5 presents the counts and weights of five debitage categories for the material above the floor level in squares 162N/105E and 164N/105E. These two units were selected because they are the least mixed of the excavation units in the refuse deposit (see Table 3.7, right-hand

Table 5.3

Raw material types for chipped stone from late Moundville III refuse deposit, White site

Biface type	Local stone			Non-local stone				
	Tuscaloosa	Quartz	Camden	Ft. Payne	Bangor	Tallahatta quartzite	Coastal Plain white	Other (unid.)
Tools								
Madison point	8	-	2	-	1 (?)	-	-	1
Flint River Spike	1	-	-	-	-	-	1	-
Proj. pt./knife fragments	12	-	1	1	1	1	-	-
Drill/piercer	8	-	-	1	-	-	-	-
Chisel (?)	1	-	-	-	-	-	-	-
Graver	1	-	-	-	-	-	-	-
Preform/ crude biface	6	1	1	-	-	-	-	-
Flake knife	1	-	-	1	-	-	-	-
All tools (%)	38 (74.5)	1 (2.0)	4 (7.8)	3 (5.9)	2 (3.9)	1 (2.0)	1 (2.0)	1 (2.0)
Debitage (%)	2011 (89.4)	135 (6.0)	28 (1.2)	4 (0.2)	6 (0.3)	21 (0.9)	14 (0.6)	31 (1.4)

Table 5.4

Counts and percentages of non-local debitage and percentages of pre-Mississippian sherds for selected units of the late Moundville III refuse deposit, White site.

Analytical unit		Local debitage (N)	Non-local debitage (N)	Non-local debitage (%)	Pre-Mississippian sherds (%)
162N/105E	L.1	109	2	1.8	2.3
	L.2	248	9	3.5	2.3
	L.3	72	2	2.7	3.2
164N/105E	L.1	91	3	3.2	3.1
	L.2	223	6	2.6	3.0
	L.3	64	1	1.5	3.1
166N/105E	L.1	85	2	2.3	4.1
	L.2	181	8	4.2	5.0
	L.3	195	5	2.5	4.3
162N/107E	L.2	52	3	5.5	3.1
	L.3	45	2	4.3	8.1
164N/107E	L.1	28	1	3.4	4.9
	L.2	32	0	0	1.7
166N/107E	L.2	38	2	5.0	4.7
162N/107.5E	L.1	106	5	4.5	6.0
	L.2	73	2	2.7	2.0
164N/107.5E	L.1	103	1	1.0	6.0
	L.2	136	8	5.6	3.0
166N/107.5E	L.2	148	9	5.7	5.0
	L.3	36	0	0	2.5
Total		2065	71	3.3	3.6

Figure 5.2

Scatterplot of percentage of non-local debitage versus percentage of pre-Mississippian sherds for selected units of the late Moundville III refuse deposit, White site

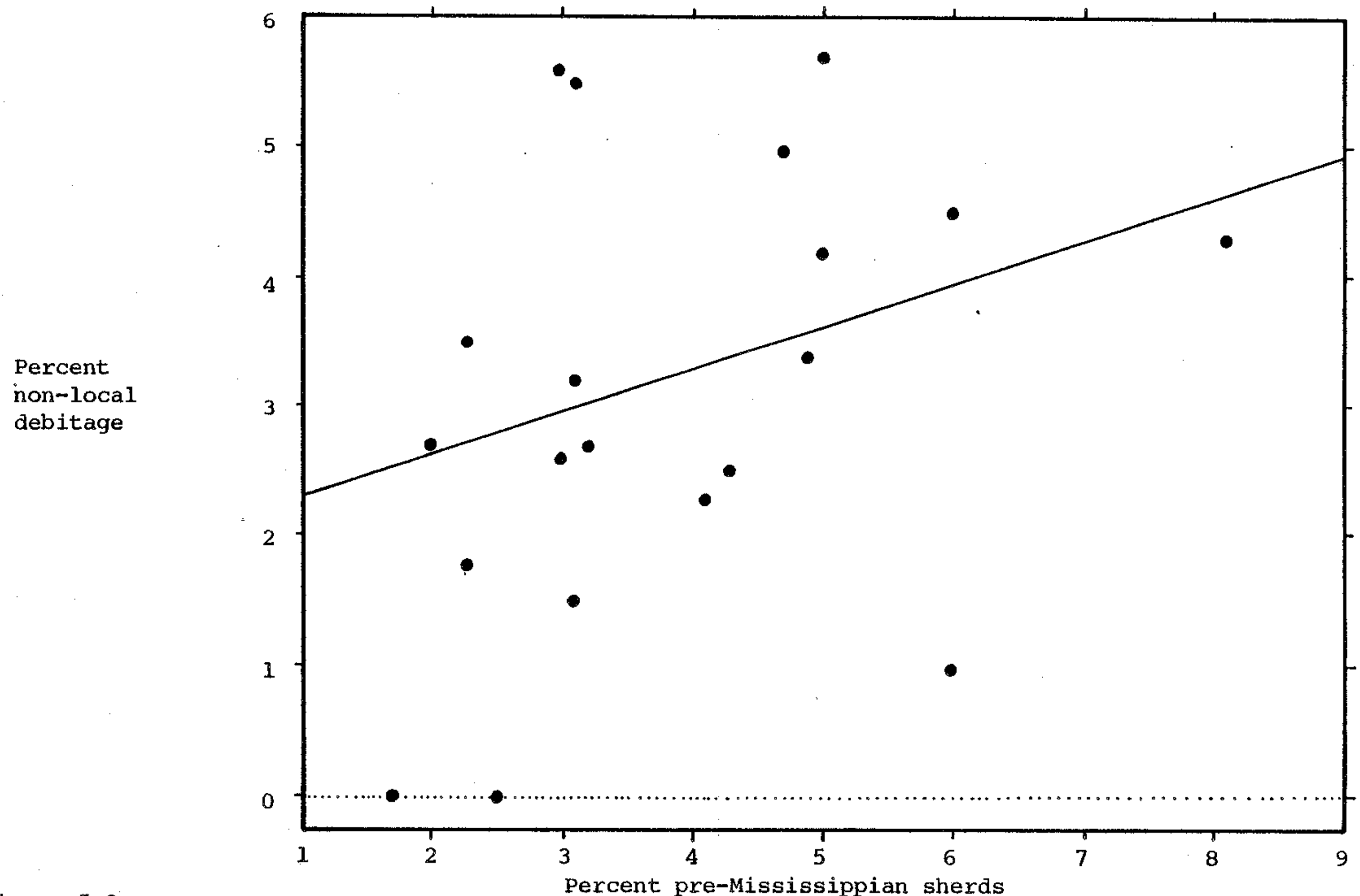

Percent
non-local
debitage
0
1
2
3
4
5
6
1
2
3
4
5
6
7
8
9
Percent pre-Mississippian sherds

Figure 5.2

column). The shatter category includes both unmodified shatter from heating (nearly all the chert has been heat-treated) and unmodified debris from bipolar fracture of cobbles. The prevalence of bipolar core reduction probably accounts for the scarcity of prepared, flawed, or exhausted flake cores, only one of which is present. Shatter and decortication flakes together represent debris from the initial reduction of cobbles to "usable" flakes. Flakes of bifacial retouch represent the final stage in the manufacture of formal tools, and also resharpening of worn tools. Miscellaneous flakes as a group are intermediate in the lithic reduction sequence.

For local raw material, the most abundant category of debitage, by count or weight, is shatter. Shatter and decortication flakes together comprise two thirds of the assemblage by count (84% by weight), and miscellaneous flakes comprise most of the remainder. Thus, the majority of the assemblage is debris from early and intermediate stages of biface manufacture. The final stage of tool production is represented by very little debris, but this is to be expected since flakes were coded as bifacial retouch flakes only if the platform was intact. These data, together with the presence of 348 unworked pebbles of local chert and quartz (mostly heat-treated but too small to be worked), indicate that all stages of the production of tools from local raw material took place at the White site.

The relative abundances of debitage categories for non-local material are distinctly different from those of local raw material (see Table 5.5). Nearly all the non-local debitage is from the intermediate or final stages of tool production. No unworked non-local material was found in these two excavation units. Keeping in mind that some of the non-local material is likely to be intrusive, the data indicate that very little non-local stone was worked at White, and what little there was had been brought to the site as prepared cores, blanks, or finished tools.

The data presented thus far support the conclusions that most cutting tools were not made of stone, and that, at least at the White site, most chipped stone tools were made of local raw material. Data from sites of the Moundville chiefdom also support a third

Table 5.5

Counts and weights of local and non-local debitage from White site, Levels 1–3 of 162N/105E and 164N/105E

Debris category	Local stone				Non-local stone			
	No.	%[1]	Wt. (g)	%[1]	No.	%[1]	Wt. (g)	%[1]
Flake core	1	0.1	16.8	3.0	0	0	0	0
Shatter	351	43.5	372.5	67.1	1	4.2	0.5	5.0
Decortication	186	23.0	94.4	17.0	0	0	0	0
Misc. flake	221	27.4	62.5	11.3	21	87.5	9.2	91.1
Flake of bifacial retouch	48	5.9	9.3	1.7	2	8.3	0.4	4.0
Total debitage	807	97.1	639.2	98.4	24	2.9	10.1	1.6

[1] Percentages calculated separately for local and non-local stone, except for totals

conclusion, that non-local lithic raw material was made into finished items at Moundville but not at the outlying sites. Excavations north of Mound R and south of the Conference Building at Moundville (Scarry 1986) yielded lithic assemblages which, though small, contrast sharply with the lithics from White. As can be seen in Table 5.6, north of Mound R non-local chert is three times as abundant as the local material, and south of the Conference Building non-local material is only slightly less abundant that the local chert. Not only are these ratios markedly different from the local:non-local ratio at White, but much more of the non-local material in these excavations at Moundville is from the early stages of tool production than is the case at White. South of the Conference Building at Moundville there was an exhausted flake core of non-local chert, something altogether absent from the White site assemblage. The abundance of non-local material in the debitage from Moundville is paralleled by the abundance of finished tools of non-local material; all 5 of the tools or tool fragments from these 2 excavation areas at Moundville are of non-local chert, compared with 14% of the tools at White. The size of the Moundville lithic samples is small, and the samples come from 2 locations within a very large site, so these data cannot be regarded as representative of the site as a whole. Nevertheless, the data do reveal that in at least 2 locations at Moundville there is far greater abundance of non-local chert than at White, and that this chert was brought to the site as cores or unmodified cobbles rather than as blanks or finished tools.

In addition to the differences already described, the chipped stone assemblages from Moundville and the White site differ in terms of the relative abundances of particular non-local sources. Table 5.7 presents counts and percentages of chipped stone by source, for the White site late Moundville III refuse deposit, the 1978–79 excavations in late Moundville I contexts north of Mound R at Moundville, and the 1978–79 excavations in Moundville I contexts south of the Conference Building at Moundville. At the White site, Ft. Payne and Bangor cherts are less abundant than Tallahatta quartzite and chert or agate from the Coastal Plain of south Alabama. In both Moundville collections, the

Table 5.6

Counts and weights of local and non-local debitage from excavations at Moundville (from Scarry 1986)

Debris category	Local stone				Non-local stone			
	No.	%[1]	Wt. (g)	%[1]	No.	%[1]	Wt. (g)	%[1]
North of Mound R								
Flake core	0	0	0	0	0	0	0	0
Shatter	6	24.0	3.9	13.6	20	26.3	40.5	50.6
Decortication	12	48.0	21.2	73.9	7	9.2	9.5	11.9
Misc. flake	7	28.0	3.6	12.5	39	51.3	26.6	33.2
Flake of bifacial retouch	0	0	0	0	10	13.2	3.5	4.4
Total	25	24.8	28.7	26.4	76	75.2	80.1	73.6

Table 5.6 (continued)

Debris category	Local stone				Non-local stone			
	No.	%[1]	Wt. (g)	%[1]	No.	%[1]	Wt. (g)	%[1]
South of the Conference Building								
Flake core	0	0	0	0	1	9.1	117.2	92.9
Shatter	0	0	0	0	0	0	0	0
Decortication	8	66.7	8.2	88.2	1	9.1	0.3	0.2
Misc. flake	2	16.7	0.5	5.4	7	63.6	8.0	6.3
Flake of bifacial retouch	2	16.7	0.6	6.5	2	18.2	0.3	0.2
Total	12	52.2	9.3	6.9	11	47.8	126.2	93.1

[1] Percentages calculated separately for local and non-local stone, except for totals

Ft. Payne and Bangor material outnumbers the Coastal Plain and Tallahatta sources. Both Ft. Payne and Bangor cherts come from north Alabama, in the Tennessee River valley. Tallahatta quartzite, like the Coastal Plain material, comes from south Alabama. Thus, the non-local chert at Moundville is predominantly from northern sources, while the non-local chipped stone at White is predominantly from sources to the south.

This does not necessarily mean that Moundville-era residents of the two sites tended to utilize different non-local materials. Nearly all of the Tallahatta quartzite projectile points recovered in surface collections in the Moundville area are Archaic stemmed forms, such as those of the Flint Creek, Little Bear Creek, Benton, and Morrow Mountain-White Springs clusters described by Ensor (1981:94–100). I suspect that much of the Tallahatta quartzite, and by extension other south Alabama material, in the Moundville area dates before A.D. 1. How much of the predominance of south Alabama material at White is the result of admixture of earlier materials is not clear. White does lie to the south of Moundville, so it is certainly possible that Moundville-era residents at White might have had greater access to southern sources than the residents at Moundville. It is also possible that the procurement of non-local stone shifted during the Moundville period, for the samples from Moundville date to the Moundville I phase while the White site material is of late Moundville III date. Analysis of lithic collections from other periods at Moundville and at other single-mound sites will be necessary to determine which of these factors is responsible for the observed differences between the White site non-local chipped stone and the samples from Moundville.

The 1978–79 excavations north of Mound R at Moundville also produced an unusual assemblage of ground and polished stone. Fully 25% (46/186) of all stone north of Mound R was greenstone or other metamorphic rock (Scarry 1986). In contrast, only 0.7% of the lithics in the late Moundville III refuse deposit at White were greenstone. The unusual abundance of greenstone north of Mound R at Moundville was also noted by C.B. Moore, who found 40–50 celt fragments in his excavations there and described this abundance as

Table 5.7

Counts and percentages of chipped stone by source, for White site and two excavation areas at Moundville

Site and phase		Local stone			Non-local stone				
		Tuscaloosa	Quartz	Camden	Ft. Payne	Bangor	Tallahatta quartzite	Coastal Plain	Other
White site	n	2049	136	32	6	8	22	15	32
late Mdvl III	%	89.1	5.9	1.4	0.3	0.3	1.0	0.7	1.4
Moundville[1]	n	17	1	7	43	27	0	0	8
Mdvl I	%	16.5	1.0	6.8	41.7	26.2	0	0	7.8
Moundville[1]	n	8	2	3	3	4	2	2	1
Mdvl I	%	32.0	8.0	12.0	12.0	16.0	8.0	8.0	4.0

[1] From Scarry (1986)

"new in our experience" (Moore 1905:221). Table 5.7 presents further information about the abundance of greenstone at Moundville and other sites in the Black Warrior valley. The excavations north of Mound R at Moundville (roughly 6 m^3) produced considerably more greenstone by weight as well as by count than the 1983 excavations at the White site (roughly 5 m^3), despite the far lower density of lithic debris north of Mound R. About two-thirds as many worked pieces of greenstone were found north of Mound R as were found in complete surface collections of nearly 30 Black Warrior valley sites with Mississippian components, and unlike the material north of Mound R, some of the surface collected material is likely to be of pre-Mississippian date.

Table 5.8

Counts and weights of greenstone items from sites in the Moundville area

Site	Worked		Unworked	
	N	Wt. (g)	N	Wt. (g)
Moundville, north of Mound R[1]	23	1170.2	23	48.8
White, late Moundville III refuse deposit[2]	19	55.8	16	15.5
Surface collections, Black Warrior floodplain[3]	38	2029.3	–[4]	–[4]

[1] From Scarry (1986)
[2] Not included here are 1 whole celt, 1 broken celt, and 1 whole discoidal found during the 1930–31 AMNH excavations
[3] From Bozeman (1982) and Alexander (1982)
[4] Bozeman (1982) did not distinguish between worked and unworked, so all pieces are counted as worked; Alexander (1982) only reported worked greenstone

While it is evident that the deposits north of Mound R have an unusual abundance of greenstone, there is another aspect of this assemblage that is not evident in Table 5.7.

The greenstone from north of Mound R includes items which appear to have broken during manufacture, as well as unworked pieces which are of a size and shape that precludes their being fragments of a finished object. In other words, greenstone items were being made north of Mound R. In contrast, the greenstone pieces from the White site are either clearly fragments of finished items or unworked chips that are so small that it is likely they also are fragments of broken items. There is no greenstone manufacturing debris at the White site. Manufacturing debris is all but absent from the 1978–79 UMMA surface collections of other outlying sites, with a couple of large, unworked pieces from one site (1 Ha 107A) being the only examples (T. Bozeman, pers. comm.; M. Pope, pers. comm.). North of Mound R at Moundville is the only location within the chiefdom where evidence of manufacture has been found, though greenstone products were widely distributed throughout the chiefdom. Numerically, the most important greenstone products were celts (or axeheads). Whole celts or fragments of broken celts are found at all levels of the settlement hierarchy. Spatulate "ceremonial" axes (also called spuds) and discs (paint palettes) were also made of greenstone, but these items or fragments thereof have only been found at Moundville and at the single-mound local centers.

Aside from items of chert and greenstone, a variety of other objects made of stone were used during the Moundville period. These include pieces of minerals used for pigments, several kinds of rock used for beads, figurines, and pipes, and a kind of fine-grained sandstone from which most of the circular or rectangular paint palettes were made. Of these lithic items, only the paint palettes could be called tools. Discussion of the other items is deferred until later in this chapter. Paint palettes have only been found at Moundville and at the White site, where fragments of a notched-edge, circular sandstone palette with traces of red pigment on both sides was found in the late Moundville III refuse deposit. The locus of manufacture of sandstone palettes is not known, nor is the source of stone certain. It is thought that the sandstone probably comes from the Pottsville Formation, which crops out from Tuscaloosa northwards (V. Steponaitis, pers. comm.).

In summary, the lithic technology of the Moundville culture was focused on locally available raw material. All stages of the production of formal tools took place at the White site, but whether this was the case at the other single-mound sites and/or farmsteads and hamlets is difficult to determine on the basis of the surface collections. Certainly the raw material was equally available to all communities in the chiefdom. The little non-local material that was found at White was late-stage manufacturing debris or finished tools. In contrast, in at least one precinct of Moundville (north of Mound R), non-local chipped stone was relatively abundant. Further, the non-local material in this precinct is primarily debris from early and intermediate stages of manufacturing. Precisely the same relationship between Moundville and the outlying sites holds true for ground stone tools: only whole or broken ground stone tools are found at the outlying sites, while manufacturing debris is found in one area (at least) at Moundville.

Other Craft Items

Compared with the cases for pottery and stone tools, there is little available information concerning the production of other craft items. In part this is due to the non-preservation of organic materials, but it is also due to the apparently sparse use of durable, formal tools in the production of craft items. While valuable information might be obtained from microscopic use-wear analyses of extensive samples of utilized flakes, this is a task I leave for other researchers. The information already available, however, does suggest a pattern for the production and distribution of other craft items.

A simple way to present information about the distribution of craft items in the Moundville chiefdom is to tabulate the kinds of items found at various sites. Since pottery and stone tools have already been discussed, they are omitted here. Bone tools and all organic materials are also omitted, since their absence at a site is at least as likely to be due to poor preservation as to actual prehistoric distributions. Table 5.8 is a list of the kinds of items recovered from Moundville, while the list of items found at the single-mound sites is presented in Table 5.9.

Table 5.9

Selected artifact classes found at Moundville

Copper axe	Mica
Copper knife	Galena
Copper gorget	White (lead) paint
Copper strip	Hematite/red paint
Copper symbol badge	Limonite/yellow paint
Copper sheet pendant	Glauconite/green paint
Copper sheet hair ornament	Psilomelane
Copper beads	Graphite
Copper earspools	Bentonite
Copper fishhooks	White clay
Copper-clad wood and bone	Asphaltum
Other copper	Drilled shark teeth
Stone ceremonial celts	Drilled bear teeth
Stone paint palettes	Unid. carnivore teeth
Stone earplugs	Ivory-billed woodpecker beaks
Stone gorgets	Bird claws
Monolithic axe pendant	Shell beads
Red slate pendant	Shell gorgets
Amethyst human head	Shell pendants
Ceremonial flint blades	Shell earplugs
Carved stone bowls	Shell spoon
Plain stone pipe	Engraved conch shell
Stone effigy pipe	Conch columella
Obsidian proj. pts.	Pearl beads

The locus of manufacture of most of the items in these two lists is not known. As previously stated, stone ceremonial celts and other greenstone items were probably made north of Mound R at Moundville, and stone palettes may have been manufactured in west central Alabama. Hematite and limonite are locally available throughout the Moundville chiefdom, and white clay is widespread on the Fall Line Hills bordering the Black Warrior valley. Bear and carnivore teeth, ivory-billed woodpecker beaks, and bird claws were also available locally or at no great distance. Nearly all of the other items in the list are of non-local raw materials, though they are not necessarily of non-local manufacture. For example, a small pit south of the Conference Building at Moundville contained 208 g of unworked mica which appears to be manufacturing debris. Sources of sheet mica are several hundred kilometers to the east and northeast, in the South Appalachian mountains

Table 5.10

Selected artifact classes found at single-mound sites

1 Ha 7,8 (White)	1 Tu 46,47[1]	1 Tu 2[2] (Snows Bend)
Copper ornament Drilled bear teeth Stone paint palette Shell pendant Shell beads Hematite/red paint Limonite/yellow paint Galena	Stone ceremonial celt	Stone ceremonial celt Shell beads Green paint

[1] From Bozeman (1982)
[2] From DeJarnette and Peebles (1970)

(Jones 1926:202–203). Another kind of item probably manufactured at Moundville is a teardrop-shaped red slate gorget: a fragment of one that apparently broke during manufacture was found at Moundville in Smithsonian Institution excavations in the 19th century (Steponaitis 1983b:138, Fig. 10g). The source of the red slate is not known, though slates of the Pottsville Formation crop out from Tuscaloosa northward. Shell beads are another craft item possibly manufactured at Moundville, with byproducts of bead manufacture being most abundant east of Mound E (Peebles 1978c:17). In contrast to these items, there is no information about the location of manufacture of artifacts of shark teeth, pearl, copper, shell (other than beads), or rare materials such as amethyst. A thorough re-analysis of the collections from excavations at Moundville might shed light on some of these materials, but as yet there are no plans for such a major undertaking.

The available information concerning production of the items listed in Tables 5.8 and 5.9 indicates that all the non-local materials demonstrably worked within the Moundville chiefdom were worked only at Moundville. There is <u>no</u> evidence for the manufacture of items of non-local materials at the outlying sites. Undeniably, the lack of evidence of such craft production at the outlying sites may be due to poor preservation or the limited extent of excavations. However, there is an obvious parallel between the data in the preceding paragraph and the data on the production of stone tools. Regardless of the function, social significance, or symbolic content of items made of non-local raw material, if they were made within the Moundville chiefdom, they were made at Moundville itself. Unfortunately, it is difficult to determine the locus of production of most items made from local raw materials. Such items in Tables 5.8 and 5.9, as well as objects of cane, wood, bone, fiber, etc., are of a nature that their manufacture would leave few diagnostic or durable byproducts. An unusual abundance (per unit excavated area) of bone awls in the northeast quarter of Moundville has been interpreted as a possible hide-working area (Peebles and Kus 1977:442); however, differential preservation could also account for this pattern, and it has not been demonstrated that these tools were used as awls rather than, for instance, corn-shuckers (C. Peebles, pers. comm.). For the two classes of goods which would leave durable and distinctive evidence of their manufacture—ceramics and chipped stone tools—there is good evidence of their manufacture from local raw materials at the outlying sites as well as at Moundville.

Items of Known Non-local Manufacture

The principal class of items found within the Moundville chiefdom but known to be of non-local manufacture is pottery. Steponaitis (1983a:347–348) identified the non-local vessels in the collection of whole pots from Moundville. These include vessels from several locales in the lower Mississippi valley, eastern Tennessee, and south Alabama. There are no vessels from what is now Georgia or from east of the Apalachicola River in Florida. In the surface collections from outlying sites, no vessels of definite non-local manufacture were noted (Bozeman 1982), nor were any non-local vessels found with the burials at White or Snows Bend (Peebles and DeJarnette 1970; Appendix I). The 1983 excavations at White also produced no sherds definitely from vessels of non-local manufacture, though some sherds are sufficiently unusual in paste characteristics or decoration that they may be from non-local vessels. In part, the absence of identified non-local vessels outside Moundville is due to the paucity of whole vessels in the collections; it is easier to identify a whole vessel as being of non-local origin than it is to identify a sherd from one. Nevertheless, if non-local vessels were present at the outlying sites in the same frequencies as they are in the Moundville whole vessel collection, it is almost certain that at least a few of them would have been identified: Steponaitis classified 935 whole vessels from Moundville, of which 16.3% (152) are obviously non-local. Also, non-local vessels were identified in the comparatively small sherd collection from excavations north of Mound R and south of the Conference Building (Steponaitis 1983a:289–295), demonstrating that it is possible to detect non-local ceramics in sherd samples. It appears that most of the non-local vessels which entered the Moundville chiefdom ended their use-life at Moundville.

As with the local whole vessels, most of the non-local whole vessels were found in burials. In every case where the sex of the burial associated with a non-local vessel is known, the buried individual was female (C. Peebles, pers. comm.). An obvious interpretation is that these individuals were non-local women who married in and brought their native pottery with them. Other interpretations are possible, however, and none of them can be considered more probable than others until tests with independent evidence are produced. The association of non-local pots with female burials is clearly a point worthy of future research.

There are a few other items found within the Moundville chiefdom that are known to be, or most likely are, of non-local manufacture. The obsidian arrowheads, for instance, probably arrived at Moundville as finished products, though without further information about their morphology, mineralogy, or chemical composition, it is not possible to say where they came from. Galena and graphite, both probably used as pigments, may be regarded as finished products, since it was the material itself that was of value. The nearest graphite sources are in eastern Alabama (Jones 1929), though whether any or all of the graphite at Moundville came from there is not known. Walthall (1981) obtained trace element data for seven pieces of galena from Moundville. Three of the specimens were assigned to the Potosi source in southeastern Missouri, not far from the American Bottoms, while the other four specimens apparently came from the Upper Mississippi Valley source in the adjacent portions of Illinois, Wisconsin, and Iowa. Obsidian and graphite have been found only at Moundville, while galena has been found at Moundville and two single-mound sites (White and 1 Tu 50 [Steponaitis, pers. comm.]). Most of the galena at Moundville is large pieces found in burials, while the galena pieces found at White were found in the refuse deposit and were very small (1.9 g and 0.8 g).

Other artifacts probably of non-local manufacture are hoes made of Mill Creek chert. Mill Creek chert comes from the Shawnee Hills in southwestern Illinois. Substantial numbers of large bifaces made from this material were distributed widely throughout the Midwest in the Mississippian period, almost always in finished form (Cobb 1985). A few (n=9) fragments of Mill Creek chert, some bearing the distinctive hoe-polish, have been found within the Moundville chiefdom; their locations are listed in Table 5.10. No whole hoes have been recovered, which could be due to their rarity or to intensive curation of the hoes. The paucity of flakes suggests that Mill Creek hoes were generally scarce. No pieces of Mill Creek chert have been positively identified at Moundville (3 flakes from north of Mound R may be Mill Creek chert—M. Pope, pers. comm.). This scarcity is as likely to result from the small size of the analyzed lithic sample as from a real absence of the material.

An interpretation of the pattern of distribution of non-locally manufactured items based on the few classes discussed here must be highly tentative. Undoubtedly there were many other non-locally manufactured items present within the Moundville chiefdom, but either they have not been identified as such or else they have not preserved or been recovered. Based on the extremely limited information available, it seems that non-local manufacture per se does not affect the pattern of an item's distribution within the

Table 5.11

Provenience of Mill Creek chert hoe fragments[1]

No. of fragments	Site	Site type and probable Moundville phase[2]	
1	1 Tu 56,57	single-mound site	I
1	1 Tu 398	single-mound site	II
1	1 Ha 91	hamlet	III
2	1 Tu 259	hamlet	III
1	1 Ha 14,15	single-mound site	III
1	1 Ha 7,8	single-mound site	III
1	1 Tu 42,43	single-mound site	III
1	1 Tu 2	single-mound site	III

[1] Information for sites other than 1 Ha 7,8 from M. Pope (pers. comm.)
[2] Phase assignments from Bozeman (1982)

chiefdom. Non-local ceramics apparently were restricted to the paramount center, galena was present at Moundville and at least one single-mound site, and Mill Creek chert hoes were present in all levels of the settlement hierarchy. The obvious conclusion is that the distribution of non-locally manufactured items depended on their function and social valuation rather than on their non-local origin. I suspect this conclusion surprises few, if any, of my readers. However, it is noteworthy in one respect, namely, that there are some classes of non-local goods for which there is no evidence that access to them was controlled by the Moundville paramount. For example, the distribution of Mill Creek hoes provides no grounds for inferring that importation was under the control of the Moundville paramount or other nobility. On the other hand, the distribution of non-local vessels lends itself to the inference that there was some restriction on the access to non-local pottery (or the women who brought it?). Similarly, the distribution of galena suggests that it was available to a set of individuals at Moundville in far greater quantities than it was to the residents of single-mound sites, and there is no evidence that it was available to residents of farmsteads and hamlets. The conclusion stated above, unsurprising though it is, is an important link in the chain of analysis by which the pattern of craft production and distribution in the Moundville chiefdom can be reconstructed.

Conclusion

This chapter commenced with a discussion of the limitations on our ability to determine the pattern and organization of craft production in the Moundville chiefdom. However, the information which is available is, for archaeological data, remarkably consistent. A concise restatement of the conclusions reached above makes this consistency clear. Ceramics were produced at Moundville and at single-mound sites, and possibly at all levels of the settlement hierarchy, but at Moundville there was some degree of specialization in the production of fine-ware vessels. Chipped stone tools were made at all levels of the settlement hierarchy, but the chipping of non-local stone was restricted to Moundville. Ground stone celts were distributed throughout the chiefdom, but they were made only at Moundville. In general, Moundville was the only site where non-local raw materials of any kind were made into finished products. Most items of definite or probable non-local manufacture were restricted to Moundville, though the distribution of non-local goods was conditioned by their function and social valuation rather than their non-local origin. Taking all this information together, there is little room for doubt that the Moundville community was both internally specialized in the production of some crafts and qualitatively different from other communities in the chiefdom in terms of access to non-local raw materials and imported finished products.

The pattern of craft production and distribution in the Moundville chiefdom is one of centralized control of the production of, and access to, most non-utilitarian goods. In contrast, most utilitarian goods were probably produced domestically. Fine-ware vessels and ground stone celts appear to be exceptions to this generalization. The celts certainly were functional objects, since many of the recovered pieces are impact-chips from the bit. Abrasion and chipping of the bases and lips of fine-ware vessels indicate they also received extensive use before disposal; this usage is not consistent with the vessels having been made expressly for burial, display, or ceremonial use, which we would expect to be infrequent and careful. It is possible, however, that both the celts and the fine-ware vessels, particularly those made by specialists, may have conveyed prestige as well as being objects of regular domestic use. Aside from celts, the (probably rare) Mill Creek hoes, and at least a few fine-ware vessels, utilitarian items were made of local raw materials and were manufactured at the same sites where they were used. Non-utilitarian items, in contrast, were generally made of non-local raw materials, were imported as finished products or were made at Moundville, and were present only at Moundville. The few classes of non-utilitarian items present at single-mound sites were present only in small quantities.

This pattern of craft production and distribution is strongly at odds with the classic redistribution model, in which the production of utilitarian items would be specialized by community. The Moundville data also contrast with the tributary model exemplified by Peebles and Kus's (1977) and Wright's (1977) analysis of Hawaiian economy, in which outlying communities would specialize in the production of non-utilitarian items. The Moundville case is, rather, a form of prestige goods economy, in which most utilitarian items were produced domestically, most utilitarian items not produced domestically were produced at the paramount center, and most non-utilitarian items were produced at and/or restricted to the paramount center.

CHAPTER VI

CONCLUSIONS

Production and Distribution in the Moundville Economy

The pattern of production and distribution of goods in the Moundville chiefdom can be diagrammed in the same way as the economic models described in Chapter II. Figure 6.1 depicts the economic structure of the chiefdom, though the complexity of the diagram has been reduced by showing only 4 local centers rather than the six actually present in the Moundville III phase. As expected, the observed pattern does not match any of the models perfectly. Nevertheless, the observed pattern very closely resembles the mobilization model for the subsistence sector (see Fig. 2.2), combined with the prestige goods model for the production and distribution of craft items (see Fig. 2.4). Briefly, the data which are represented by Figure 6.1 are as follows. The results of settlement pattern and catchment analyses presented in Chapter IV are consistent with the mobilization of agricultural foodstuffs to support the elite at Moundville. In the faunal remains from the White site there is strong evidence for provisioning of choice parts of deer carcasses to the elite at this local center, and by extension it seems highly probable that elite individuals resident at Moundville would have been similarly provisioned. As detailed in Chapter V, there is evidence that the centripetal movement of subsistence goods was balanced by the outward distribution of craft items from Moundville. These craft items were primarily objects manufactured non-locally, or objects manufactured at Moundville from non-local raw materials. The outwardly distributed craft items include prestige goods, such as greenstone ceremonial celts and stone paint palettes, as well as objects of apparently utilitarian nature, such as greenstone axes. While the outwardly distributed prestige goods were restricted to the nobility at single-mound sites, the utilitarian goods were available to all segments of the outlying communities. The prestige goods available to the nobility at the single-mound sites constitute only a small subset of the range of prestige goods present at the paramount center. These data are consistent with the prestige goods model of craft production and exchange.

There are also differences between the Moundville economic pattern and the mobilization + prestige goods model. First, no interdistrict exchange of subsistence goods was detected (i.e., the horizontal arrows between local centers in Fig. 2.2). Since subsistence remains are available for only one of the local centers, the apparent absence of such exchange may be nothing more than an artifact of inadequate sampling. Even if data were available from other local centers, interdistrict exchange might still be difficult to detect. Since the site catchments are so similar, exchanges might have involved subsistence goods that were produced in all districts but that may have been differentially abundant on a seasonal or annual basis.

The second, and more significant, difference between the observed data and the mobilization + prestige goods model is the lack of evidence for the centripetal movement of craft items for the paramount chief to use in external exchange. As discussed in Chapter V, this lack of evidence may be due to the lack of preservation of organic materials. Leaving aside this largely unaddressable issue, there is still a difference between the observed pattern of craft production and the prestige goods model. The paramount center is the only location in the Moundville chiefdom where evidence of craft specialization has been found. In Figure 6.1 this is depicted as the production of prestige goods by the domestic units directly beneath the paramount center (the domestic producers are actually resident <u>in</u> the paramount center, but drawing the symbols for the producers and their products inside the symbol for the paramount center results in a diagram not easily interpretable). The prestige goods model specifies that craft items destined for exchange

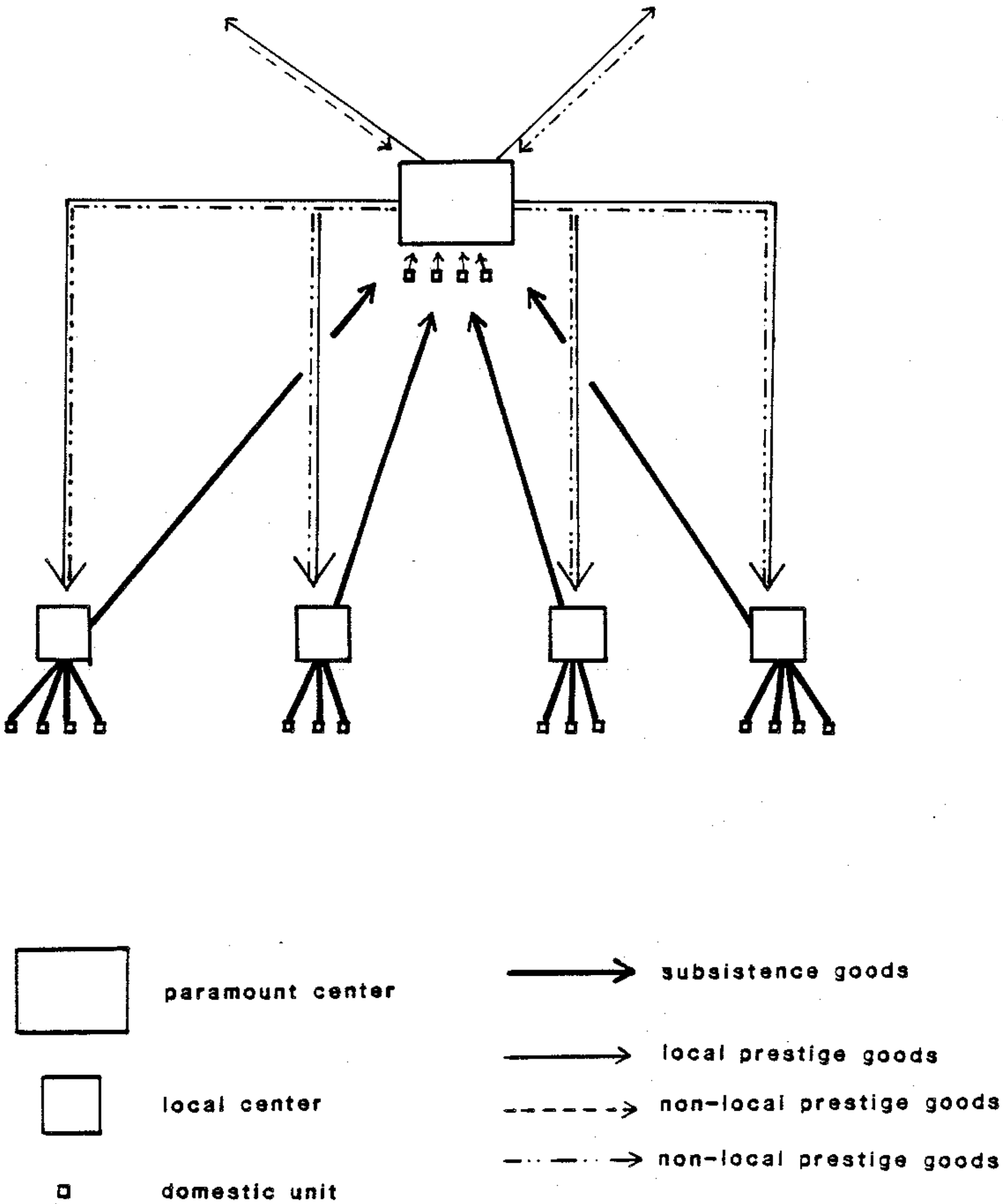


Figure 6.1

The structure of the Moundville economy

are produced throughout the chiefdom and are "passed up as tribute through the political hierarchy to a superordinate chief" (Frankenstein and Rowlands 1978:77). Frankenstein and Rowlands (1978:77–78) did describe a variant of the prestige goods model in which specialized craft production would be centered at the paramount's settlement:

> But, when the technical skill required for the working of certain resources—such as metal—is not accessible to everyone, then control over production of wealth items is as convenient as control over the actual [raw material] sources. There would be considerable incentive to develop specialist skills not attainable at the local settlement level and to control the use of these skills in the production of prestige and status items.

The production of greenstone celts and chipped stone tools from non-local raw material certainly does not qualify as the sort of esoteric skill intended in the quoted passage, since these skills had been practiced in the southeastern U.S. for millennia before the advent of the Moundville chiefdom. It is not so clear whether the mold-making technique of ceramic manufacture used by some potters at Moundville in late Moundville II/Moundville III times does qualify as a technical skill "not accessible to everyone". Certainly it is not nearly as complex a skill as ore smelting, which is what Frankenstein and Rowlands had in mind. It appears, therefore, that the centralization of craft specialization at the paramount center of the Moundville chiefdom does not coincide with the conditions in which Frankenstein and Rowlands suggest it would develop.

Before proceeding, it is appropriate to call attention to two assumptions which have been made in reconstructing the economic pattern diagrammed in Figure 6.1. Most of the data used in this study come from late Moundville III contexts at one local center (the White site) and from late Moundville I contexts north of Mound R at Moundville. The paucity of excavation at other local centers leaves open the possibility that economic relationships between those centers and Moundville may have been different than the relationship between White and Moundville. Surface collections and small-scale excavations at the other local centers provide data that are consistent with the interpretation shown in Figure 6.1, but it is an exaggeration to say that these data <u>support</u>

this interpretation. I have, therefore, assumed that all local centers have similar economic relationships with the paramount center.

The second assumption underlying this reconstruction is that the differences between data from north of Mound R at Moundville and from the White site result from the differences between the social contexts represented by the excavated deposits, rather than from the chronological difference between them. Put simply, I assume there is no change in the economic structure of the chiefdom between late Moundville I and late Moundville III. Where available, data from other contexts at Moundville have also been drawn into the analysis. Many of these data are not well controlled chronologically, and there are no systematically collected and analyzed subsistence remains from Moundville post-dating late Moundville I. Moundville is already the paramount center of a complex chiefdom by the time the deposits north of Mound R were formed (Welch 1987), but at present there is little else to support the assumption of no structural change between late Moundville I and late Moundville III. This fact is of particular importance in the examination of the dynamic behavior of the Moundville economy, which is discussed later in this chapter.

External Relations of the Moundville Chiefdom

One aspect of the economy of the Moundville chiefdom has not yet been discussed, namely, the external relations of the chiefdom. By "external relations" I mean the political or other connections manifest by the exchange of goods between polities. Of course, the exchange of goods is not a universal and necessary concomitant of social relationships, but patterns of exchange often are sensitive indicators of such relationships (cf. Sahlins 1972:185–314).

Information is presented in Chapter V about the sources of non-local goods present in the Moundville chiefdom. In brief, there are goods from south, west, and north of the Moundville chiefdom, but none from the northeast, east, or southeast. Data on imported ceramics reveal how marked this absence of eastern goods is. During the period of the

Moundville polity's maximum size and complexity (late Moundville II/Moundville III phases), most of what is now Georgia was occupied by communities whose ceramics predominantly had complicated-stamped exteriors (i.e., South Appalachian Mississippian; see Ferguson 1971; Hally and Rudolph 1986). In a sample of 98,850 sherds from excavations at Moundville, Wimberly (1956) found only 24 complicated-stamped sherds, and it is entirely possible that these may be of Woodland (pre-Moundville chiefdom) date. While some raw materials, most notably copper, may have come from the South Appalachian area, no objects that demonstrably were manufactured in the South Appalachian area have been found within the Moundville chiefdom. Peebles (1986) interpreted this absence of exchange as indirect evidence that the historic enmity between the Choctaws and the Creeks reaches well back into prehistory.

While researchers have successfully determined the locus of origin of many of the exotic goods found within the Moundville chiefdom, there has been much less success in determining where Moundville-manufactured goods went. Aside from pottery, few goods are demonstrably of Moundville manufacture.

One type of item possibly of Moundville manufacture is a triangular pendant made of red slate (see Webb and DeJarnette 1942:Pl. 58.2; Steponaitis 1983b:Fig. 10g). A fragmentary pendant similar to the Moundville examples was recovered from the Seven Mile Island site along the Tennessee River in northwest Alabama (Webb and DeJarnette 1942:Pl. 58.2). The design of these pendants, both shape and decoration, is duplicated by copper pendants found at Moundville (Moore 1905:Figs. 32, 38, 41, 1907:Figs. 100–104), but to my knowledge no similar copper pendants have been found elsewhere.

Greenstone axes were manufactured north of Mound R at Moundville, as described in Chapter V. Some of these axes may have been exchanged with other polities. Unfortunately, little is understood about the significance of variation in axe morphology, and we cannot yet distinguish where any given axe was made. Stone paint palettes are another class of non-ceramic items possibly manufactured at Moundville and exchanged extra-locally. There are both circular and rectangular palettes at Moundville, with the circular forms being more common. Webb and DeJarnette (1942:287–291) studied the distribution of circular stone palettes in the Southeast and concluded that:

> [It] may be stated with confidence that the vicinity of Moundville, Alabama, has yielded by far the largest number of disks, as well as the largest, most carefully wrought, and most elaborately engraved ones. This would seem to suggest Moundville as a center from which these artifacts spread, although queerly enough it seems to be located on the edge of the area of their known occurrence. It appears that, if Moundville were a center of distribution, they were not carried to the south or east, but that they were confined to the interior drainage basin and to sites reached from the Mississippi River and the Gulf.

If palettes were manufactured at Moundville, it is interesting that they have been recovered from northeast Tennessee and northwest Georgia (see Webb and DeJarnette 1942:290–291), since none of the artifacts reported from Moundville or its subsidiary sites are known to come from these areas.

The most visible indicators of exchange with Moundville are ceramic vessels. Nobody has yet attempted to enumerate all the potentially Moundville-made vessels found outside the Moundville area, and even the most thorough review of the literature would not produce definitive results. The difficulty is that attributing a vessel to Moundville-area manufacture is hazardous unless the person making the attribution is familiar with the range of pastes, surface finishes, vessel morphologies, decorative motifs, and stylistic treatments of known Moundville vessels, and can examine the vessel in question at first hand.

As an example of how difficult the problem of attribution can be, and how statements in the literature can be misleading, however unwittingly, it is instructive to consider an illustration in Walthall's (1980:218) book on Alabama prehistory. Six drawings of vessels are presented with the caption, "Pottery vessel forms from Moundville." Since Walthall actually worked at Moundville, conducting excavations and examining the extant collections, the reader is led to believe that the illustrated vessels are characteristic of Moundville pottery. In fact, though the vessels were found at Moundville, they are not at all characteristic of Moundville pottery. Steponaitis's (1983a) study of Moundville pottery shows that three of the illustrated vessels are diagnostically non-local (upper left: Andrews Incised var. unspec.; upper center: Pensacola Incised var. Little Lagoon; lower right: Nodena Red on White var. unspec.), two are a vessel form of which only eight examples are known from the entire Southeast (terraced rectangular bowl, of which six were found at Moundville), and the remaining vessel is a cylindrical bottle, which is an unusual shape for Moundville-made vessels. I hasten to add that Walthall's book was written before Steponaitis's classification of Moundville pottery became available, so that it is hindsight that makes the selection of these vessels for illustration seem woefully misleading. Nevertheless, we can expect that many other assessments of pottery as being "like that from Moundville" are similarly flawed.

The situation is not hopeless, however. I certainly do not wish to imply by the bleak tone of the preceding paragraph that the archaeological literature should be ignored. A statement by Griffin close to fifty years ago still holds true:

> The fine black ware at Moundville with engraved designs is represented [in the Wheeler basin in northern Alabama] by a few specimens. This would seem to indicate trade relations and suggests chronological contemporaneity. (Griffin 1939:163)

As the passage above indicates, it has long been recognized that some pottery found at sites in north Alabama closely resembles pottery made at Moundville. In an effort to determine whether sherds from sites in the Guntersville basin in northeast Alabama actually came from vessels made at Moundville, Heimlich (published 1952 but written in 1940–1941) submitted Guntersville basin and Moundville sherds to F. R. Matson, then at the University of Michigan Museum of Anthropology, for thin-section analysis. The results, excerpted in Heimlich (1952:29–32), were inconclusive: a Moundville origin for Guntersville sherds could not be ruled out, but a local origin was considered more probable. Unfortunately, there have been no subsequent attempts to determine whether vessels, or sherds from them, found in north Alabama were actually made at Moundville. Among the published photographs of north Alabama ceramics, there are a few vessels that are morphologically and stylistically so similar to Moundville pottery that a Moundville origin for them is likely. These include vessels of Moundville Engraved var. Hemphill (Webb and DeJarnette 1942:Pls. 67.1, 262.2, 268.1), Moundville Engraved var. Tuscaloosa (Webb and DeJarnette 1942:Pls. 122.2, 261.1 left, 267.2), and Bell Plain var. Hale (Webb and DeJarnette 1942:Pl. 60.1). I have not examined the vessels themselves, so I can only suggest that they may be of Moundville origin.

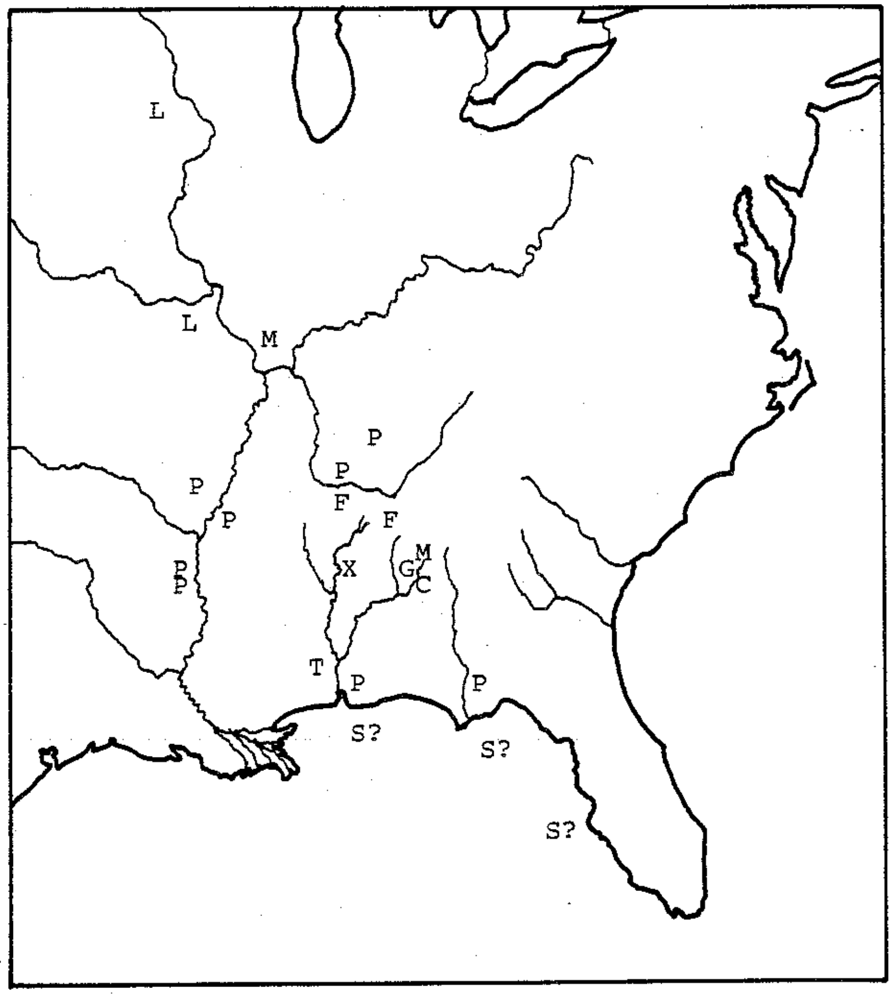
Other vessels potentially of Moundville origin but found elsewhere include a number of those from the lower Mississippi valley illustrated in Phillips et al. (1951:Figs. 110a-d, 111f-h). In the captions for these photographs, Phillips et al. carefully distinguish these vessels as "resembling Moundville type", rather than as being imports from Moundville, a caution applauded here. Nearer to the Moundville site, sherds from vessels possibly originating at Moundville have been identified at Lubbub (Mann 1983:74) along the central Tombigbee River. Doubtless many other sherds of the same sort can be found elsewhere in west Alabama. Continuing research on the collections of the Alabama Department of Archives and History, mostly from the Montgomery area, may reveal vessels from that area that might have been exported from Moundville (C. Sheldon, pers. comm.). Along the Alabama River from Selma to the Mobile delta—in other words, to the south of Moundville—there seems to have been only sparse occupation during the time of the Moundville chiefdom, and examples of ceramics possibly made at Moundville are correspondingly rare (Jenkins and Paglione 1982:14–15).

The patterns of identified Moundville imports and exports are mapped in Figures 6.2 and 6.3. Obviously, many more imports than exports have been identified. The principal similarity between the two maps is the clustering of export destinations and import origins along the Tennessee River in northwest Alabama, and in the general vicinity of Memphis, Tennessee. This is not to say that there were direct exchange relationships between Moundville and either of these areas, though it is tempting to speculate that the northwest Alabama communities may have been intermediate partners in a series of exchanges linking the Moundville polity with polities in the lower Mississippi valley. Another similarity between the two figures is the near absence of any connection between Moundville and groups to the east. Aside from raw materials—which could have been procured directly rather than obtained through exchange—the only eastern connections are several paint palettes found northeast of Moundville and a few pottery vessels found at Moundville that are thought to come from southeast of Moundville. If, as Sahlins (1972:185–196) suggests, hostility is the converse of exchange, then Peebles (1986) is probably correct in inferring protracted hostility between Moundville and groups to its east.

Dynamics of the Moundville Economy

Finally, we come to the issue I described in Chapter II as the reason for doing research on economic structure, namely, investigating the dynamic behavior of the economy. There are two kinds of dynamic behavior, which I call structural change and secular change. Structural change is fundamental change in the organization of the economy, i.e., change in the ways persons and groups are interrelated. Secular change involves change of particular persons or groups occupying specific structural positions, without any modification of the overall economic structure. The economic structure diagrammed in Figure 6.1 has implications for both secular change and structural change of the Moundville economy. I discuss secular change first.

The economic structure of the Moundville chiefdom tends to minimize the extent or rapidity of secular change, at least in comparison with the tributary model described by Wright (1977, 1984). In the Moundville economy, shortfalls in the production of subsistence goods in one or a few districts of the chiefdom would have relatively little effect on the paramount's ability to maintain customary levels of distribution of prestige goods. To make up for shortfalls in the tribute flow from one district, the paramount could temporarily increase the tribute extraction rate for other districts. The paramount could thereby continue to sponsor a stable level of craft production and external exchange. Since

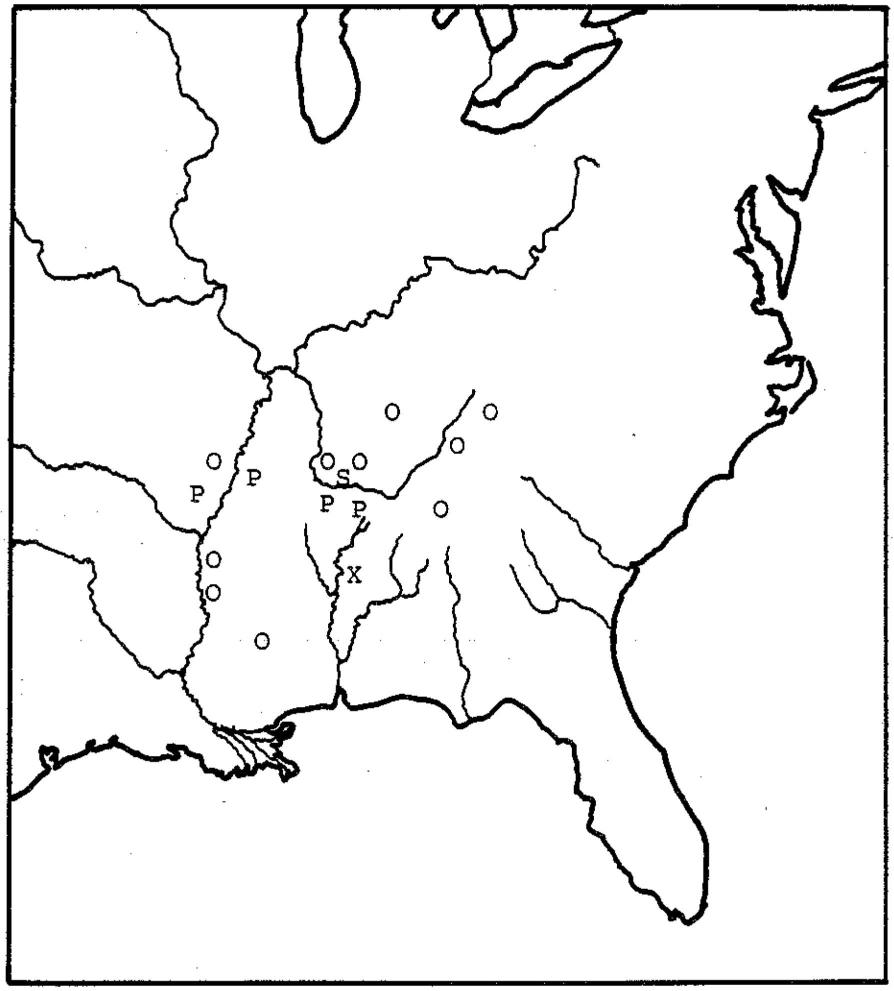


P Pottery
M Mill Creek chert hoes
F Ft. Payne/Bangor chert
T Tallahatta quartzite/ Coastal Plain chert
M Mica
G Greenstone
L Galena
S Marine shell
C Graphite

X Moundville

Figure 6.2

Location of origin of artifacts or materials found at Moundville



P Pottery
O Paint palettes
S Red slate pendants
X Moundville

Figure 6.3

Location of possible exports from Moundville the prestige goods desired by the lesser nobility are of non-local origin, the paramount's ability to maintain craft production and exchange levels would give him the ability to supply his nobles' wants unabated. This contrasts with the tributary model presented by Wright (1977, 1984). In an economy of that structure, subsistence shortfalls in even one district can decrease or eliminate the supply of a whole class of craft items, thereby decreasing the paramount's ability to maintain customary levels of external exchange and internal distribution of prestige goods. Of course, the Moundville economy, just like a tributary economy, would be susceptible to political unrest if shortfalls in subsistence production were general throughout the chiefdom. Insofar as subsistence shortfalls are caused by the vagaries of weather, the Moundville economy is resistant to secular change except in response to widespread weather phenomena, while a tributary economy is susceptible to secular change as a result of both widespread and localized weather phenomena.

The structure of the Moundville economy also tends to minimize the possibility of political unrest resulting from intentional manipulation of production at the district level. In a tributary economy, decreased production rates in a few, key districts can seriously impair the incumbent paramount's ability to meet the demand for largesse. Intentional manipulation of district economies is, thus, an obvious strategy for a potential usurper of the paramountcy. In contrast, a potential usurper of the Moundville paramountcy would have to manipulate the rate of production of subsistence goods in more than a few districts, or would have to manipulate the production of craft items at the paramount center. Both of these alternatives are riskier undertakings than would be required of a potential usurper in a tributary economy, since they would be more difficult to conceal from the paramount.

The other economic strategy for usurping the paramountcy in the Moundville chiefdom is manipulation of external exchange, either by interdicting travel or by co-opting the external partners in exchanges. Such tactics would also be difficult to conceal from the paramount, since they would involve long journeys by the potential usurper or movement of a sizable group of his supporters. In all but the largest of chiefdoms, it would be an easy matter for the paramount to determine who is not where they are supposed to be. Thus, secular changes resulting from this sort of economic manipulation should have been fairly rare in the Moundville chiefdom.

Does the Moundville chiefdom fulfill the expectation of a low rate of secular change? This is a difficult question to answer. If usurpation of the paramountcy were followed by a shift of the paramount center, then the rate of secular change could be estimated by the frequency of shifting of the paramount center. In the Moundville chiefdom, however, it is clear that once the Moundville site became the paramount center, it remained so despite whatever secular change may have occurred. Obviously, a part of being the Moundville paramount was being <u>at</u> the Moundville site, with its massive public architecture and rich symbolic content. Once the construction of the mound-plaza complex was begun, the Moundville site became a non-portable symbol of the political power and authority of the Moundville paramount, so that prospective Mohammeds must needs go to the mounds rather than vice versa. Whether the replacement of one ruling lineage by another might have been physically symbolized in some other way, such as addition of another layer of mound fill and erection of new mound-top structures, is an interesting question for which I have no answer. In any case, we have practically no knowledge of the stratigraphy of mounds at Moundville.

The stratigraphy of the mounds at some of the single-mound sites is known, and there is considerable difference between sites. The difference, however, appears to be the result of differences in the duration of use of the mounds. The mound at 1 Tu 46,47, for example, had at least seven construction episodes (Bozeman 1982:114–115), while the White mound had only two. The 1 Tu 46,47 mound was in use from early Moundville III through late Moundville III and possibly into Moundville IV, while the White mound was in use only during late Moundville III. If the addition of a new mound layer denotes a change of the lineage of the local nobility, these data indicate roughly 2–4 changes per 100 years, or once every 1 to 2.5 generations. The estimates of the duration of the mounds' use are so uncertain, however, that the rate could differ from this range by a factor of at least two in either direction. Moreover, there is no particular reason to assume that a mound construction episode denotes a change of elite lineages.

In short, I see no good way to estimate the rate of secular change in the Moundville economy. This situation might be improved with the addition of stratigraphic data from the mounds at Moundville, but the real problem is a lack of bridging arguments rather than a lack of data. Until we can determine how to recognize secular economic change in the archaeological record of the Moundville chiefdom, these implications of the structure of the economy will remain intriguing but untested.

In addition to the implications for secular change, the organization of the Moundville economy has implications for its structural dynamics. Knowing how an economy is organized allows the researcher to determine what factors may cause the organization to change. Aside from demographic collapse, environmental catastrophe, subjugation by more complex societies, and other factors to which all economic systems are susceptible, the principal factor which could bring about the collapse of the Moundville economy is a loss of external exchange. This was pointed out by Frankenstein and Rowlands (1978:79) in their discussion of the prestige goods model. If the symbols which legitimize the status and authority of the elite become unavailable, then the legitimacy of the elite inevitably will be called into question. If only a few of the symbols become unavailable, it is probable that substitutes can be introduced. However, if a large number of legitimizing symbols are persistently or chronically unavailable, the system of statuses is likely to break down.

For a large and powerful chiefdom, unavailability of a large number of legitimizing symbols is not likely to ensue from the loss of only one partner in external exchange, but rather from a decline in a paramount's ability to dominate the region. So long as the paramount remains able to dominate neighboring polities militarily, it is to their advantage to maintain peaceful relationships with him through exchange. If the paramount cannot dominate all his neighbors, then other polities may shift their alliances. If a large number of neighboring polities shift their alliance and cease exchanges with the formerly dominant chiefdom, then the chiefdom as a political entity is likely to collapse.

The Moundville chiefdom collapsed during the first half of the 16th century. It almost certainly was defunct by A.D. 1540, when the de Soto expedition crossed central Alabama. Though de Soto's route is not definitely known, it is clear that by de Soto's intent and native collusion, he visited all the major political centers in the Southeast. Though the Moundville site must have been far more visually impressive during its heyday than the communities the expedition had already seen and that the journals of the expedition describe, journals of the expedition do not describe any site that could have been Moundville. Since it probably would have been visited if it were an important political center, and since if it had been visited it probably would have been described, the fact that Moundville is not described means that by A.D. 1540 it probably was no longer a major political center and may even have been unoccupied.

There is substantial evidence that the collapse of the Moundville chiefdom may have been caused by the loss of its regional dominance. Despite the hostility inferred from the absence of exchange with groups to the east, the Moundville site had no fortifications until the Moundville III phase. At that time, a bastioned palisade wall was built around the site. It was kept in repair and sections of it were completely rebuilt at least twice (Allan 1982). At roughly the same time as the palisade was erected at Moundville, the Tennessee River valley in northwest Alabama was abandoned, while the northeastern part of the valley continued to be occupied by communities with increasingly strong connections to northwest Georgia polities (Walthall 1980:251–257). And there was a major increase of population along the middle and upper Alabama River and the lower Coosa River (C. Sheldon, pers. comm.). While all this was taking place, the abundance of imported items at Moundville steadily declined. Peebles (1985) presented figures for the abundance of imported goods (copper earspools, imported ceramics, and strings of shell beads) at Moundville. Since these items are normally found in burials, and the number of burials differs by archaeological phase, he standardized the import abundances by dividing the number of goods by the number of dated burials per phase. The results are listed in Table 6.1 and are displayed in Figure 6.4. All three imports decline in abundance from the start of the Moundville III phase onwards. These data are in accord with the Moundville chiefdom gradually losing its regional military dominance (probably to groups in northwest Georgia), losing a principal exchange partner in northwest Alabama (they may have been driven out), losing access to the sources of graphite, greenstone, and mica in east Alabama (these would have been controlled by the growing polities along the Coosa and Alabama rivers), and, after a prolonged decline in the availability of socially necessary status symbols, losing its hierarchical organization.

What is most surprising about Figure 6.4, however, is that a severe shortage of imported goods happened earlier in the history of the Moundville chiefdom with no attendant loss of hierarchical organization. The difference between the effects of this early drop in abundance and the later one is that Moundville did not lose its regional dominance during the earlier period. In fact, the Moundville chiefdom seems to have been growing rapidly and expanding its sphere of control during this period, as evidenced by a wave of depopulation expanding out from the Moundville area. If this depopulation was due to bellicosity of the Moundville chiefdom, as seems likely, the decrease in imports is easily explained: hostility is the converse of exchange. If this explanatory scenario is correct, then it also supports a point made by Wright (1984:45): successfully making war on your neighbors can be an adequate substitute for a sufficient supply of prestige goods. This is a form of explanation so unusual that I emphasize its purport. Not only has the occurrence of political collapse been explained, but its non-occurrence under partially similar conditions has been accounted for.

Table 6.1

Absolute abundance and abundance per dated burial for selected imported goods and locally made pottery[1]

	Moundville phase											
	I		I/II		II		II/III		III		late III	
	No.	No. per dated burial	No.	No. per dated burial	No.	No. per dated burial	No.	No. per dated burial	No.	No. per dated burial	No.	No. per dated burial
Burials	19	-	15	-	46	-	61	-	93	-	27	-
Imported vessels	6	.31	5	.33	1	.02	22	.36	15	.16	3	.11
Copper earspools	0	0	4	.27	2	.04	5	.08	4	.04	0	0
Strings of shell beads	4	.21	12	.80	0	0	30	.49	18	.19	2	.07
Local vessels	3	.16	4	.27	14	.30	30	.49	24	.26	12	.44

[1] From Peebles (1985)

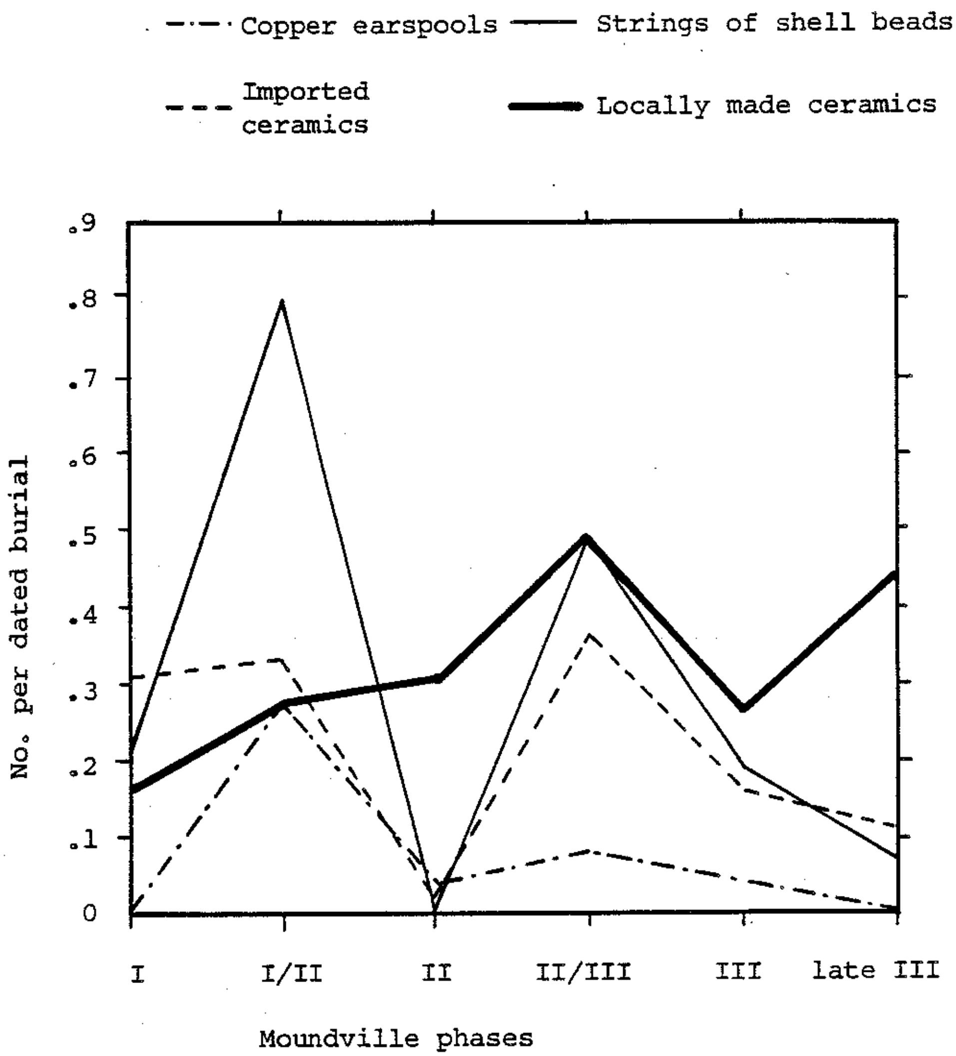


Figure 6.4

Abundance of selected imported goods and locally made vessels per dated burial at Moundville

To conclude this study, I repeat a statement made in Chapter II. Models of economic structure are sources of questions rather than alternative answers. By examining the models we can determine which questions need to be answered if we wish to reconstruct the economic organization of a prehistoric society. That reconstruction is not the goal, however. We turn to the models again to determine what the expected behavior of the economy would be under varying conditions. The reconstructed economy serves as data for testing the implications derived from the models. To the extent that the expectations are not fulfilled, flaws in the theoretical assumptions made when working out the test implications are revealed. This study focuses mainly on the first step, reconstructing an economic organization. The second step has barely been begun, because of uncertainties in the reconstruction and a lack of bridging arguments to bring the available data into logical relation with some of the test implications. Nevertheless, when the structural dynamics expected of a prestige goods economy are considered, they are found to be consistent with the observed archaeological data.

APPENDICES

APPENDIX A

LIST OF ARTIFACTS BY EXCAVATION PROVENIENCE

This Appendix presents a brief summary of the artifact contents of the 1983 excavation units at the White site. The minimal provenience unit in these excavations, say, a level within a square, was assigned a Field Specimen number (FS #). Each FS # is reported separately here, in stratigraphic order within the excavation unit. The excavation units are presented in order from south to north, then from east to west.

All the values presented in the following tables are counts. In some instances complete counts were not made, especially of charred botanical material. In these cases the relative amounts are indicated by terms such as "lots" or "few", indicating, respectively, hundreds of pieces and less than about 50 pieces. Daub and sherds under .5 inch were not counted, but their presence or absence is indicated.

The ceramic classification used here follows that of Steponaitis (1983a) for the Moundville ceramics, and Jenkins (1981) for all other ceramics. Projectile point classifications follow Cambron and Hulse (1975). The category of "local" chipped stone here refers only to the yellow-tan (and red heat-treated) chert of the Tuscaloosa gravels. Retouched or utilized stone is local unless stated otherwise.

FS # 123 Square 162N/105E Level description 0–10 cm b.s.

Historic material: 8 glass; 13 metal; 2 pottery; 1 coal

Bone: 235 Shell (umbos): 2 Carbonized plants: 58

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 135 Unmod. pebbles: 52 Qtz. debitage: 9
Non-local debitage: 3 Local debitage: 99
Other: 1 petrified wood; 1 misc. biface frag.; 1 drill; 1 chip greenstone

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
Grog tempered		
Baytown Plain		
Roper	11	2
Mulberry Creek Cordmarked		
Aliceville	1	
Shell tempered		
Mississippi Plain		
Warrior	403	30 (26)
Hull Lake (sand)	3	
Hull Lake (grog)	12	
Bell Plain		
Hale	16	3
Big Sandy (sand)	2	1
Big Sandy (grog)	74	15
Carthage Incised		
Carthage	1	2
Fosters		1
Moon Lake	3	3
Unclassified		
Red painted	20	1
White painted	12	1
Red & white painted	1	3

FS # 127 Square 164N/105E Level description 10–20 cm b.s.

Bone: 616 Shell (umbos): 11 Carbonized plants: yes (not counted)

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 234 Unmod. pebbles: 99 Qtz. debitage: 9
Non-local debitage: 10 Local debitage: 235
Other: 2 chips greenstone; 1 ground stone frag. (not greenstone); 2 retouched pcs; 1 yellow ochre; 1 "chisel"; 1 coal

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	4	
Unclassified		1
Grog tempered		
Baytown Plain		
Roper	36	3
Tishomingo	4	
Mulberry Creek Cordmarked		
Aliceville	5	
Surface eroded	1	
Shell tempered		
Mississippi Plain		
Warrior	1631	168 (21)
Hull Lake (sand)	10	
Hull Lake (grog)	25	2
Moundville Incised		
unspecified	1	
Bell Plain		
Hale	65	6
Big Sandy (grog)	157	29
Moundville Engraved		
unspecified	2	
Carthage Incised		
Akron		2
Carthage	10	
Fosters	2	3
Moon Lake	1	4
unspecified	40	1
Kimmswick Fabric Impressed		1
Unclassified		
Red painted	58	7
White painted	35	5

Type/variety	Body sherds	Rims (handles)
Red & white painted	2	3
miscellaneous	2	
Surface eroded	24	2

Other: 2 shell tempered discoidal; 1 grog tempered discoidal

FS # 133 Square 162N/105E Level description 20 cm to strat. break

Bone: 258 Shell (umbos): 6 Carbonized plants: >100 pcs

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 41 Unmod. pebbles: 18 Qtz. debitage: 3
Non-local debitage: 3 Local debitage:63

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Autauga	1	
Furrs Cordmarked		
Pickens		1
Surface eroded	1	
Grog tempered		
Baytown Plain		
Roper	12	2
Mulberry Creek Cordmarked		
Aliceville	1	
Shell tempered		
Mississippi Plain		
Warrior	447	34 (20)
Hull Lake (sand)	1	2
Hull Lake (grog)	1	
Bell Plain		
Hale	6	3
unspecified	21	4
Carthage Incised		
unspecified	3	
Unclassified		
Red painted	8	1
White painted	5	2
miscellaneous	3	
Surface eroded	2	

Other: 1 Bell Plain Hale discoidal; 1 shell tempered object shaped like a peanut shell (ear plug?)

FS # 166 Square 162N/105E Level description Artifacts on floor

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered Mississippi Plain Warrior	2	2

FS # 253 Square 162N/105E Level description strat. break to 30 cm b.s.

Bone: 95 Shell (umbos): 2 Carbonized plants: 83

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 22 Unmod. pebbles: 19 Qtz. debitage: 3
Non-local debitage: 6 Local debitage: 38
Other: 2 Madison points; 1 preform/crude knife; 1 possible ground stone

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Autauga	1	
Furrs Cordmarked		
Pickens	1	
Grog tempered		
Baytown Plain		
Roper	16	1
Mulberry Creek Cordmarked		
Aliceville	2	
Shell tempered		
Mississippi Plain		
Warrior	137	6 (8)
Bell Plain		
Hale	2	1
Big Sandy (grog)	3	
Carthage Incised		
Carthage		1
Fosters		1
unspecified	1	
Unclassified		
Red painted	4	
Surface eroded	2	

FS # 261 Square 162N/105E Level description gray deposit below floor level, N part of unit

Bone: 293 Shell (umbos): 20 Carbonized plants: 130

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 56 Unmod. pebbles: 54 Qtz. debitage: 7
Non-local debitage: 61 Local debitage: 468
Other: 1 petrified wood; 3 red ochre; 1 nutting stone; 2 Hamilton points; 1 Madison point base; 2 distal proj. pt. tips; 2 misc. retouched pcs.; 1 preform; 3 utilized flakes

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	3	
Lubbub	1	
Alexander Pinched		
Prairie Farms	1	
Unclassified	1	
Grog tempered		
Alligator Incised		
unspecified	1	
Baytown Plain		
Roper	26	
Tishomingo	1	
Mulberry Creek Cordmarked		
Aliceville	8	
Tishomingo	1	
Unclassified	1	
Shell tempered		
Mississippi Plain		
Warrior	261	17 (7)
Hull Lake (sand)	4	1
Hull Lake (grog)	4	
Bell Plain		
Hale	8	1
Big Sandy (grog)	2	2
Carthage Incised		
Fosters		1
Moon Lake		1
Kimmswick Fabric Impressed	1	
Unclassified		
Red painted	2	

Type/variety	Body sherds	Rims (handles)
White painted	1	
miscellaneous	2	
Surface eroded	13	

Other: 1 Mississippi Plain Warrior discoidal; 1 shell tempered, fired "lump"

FS # 104 Square 164N/105E Level description 0–10 cm b.s.

Historic material: 24 glass; 9 metal; 2 pottery; 2 brick/tile; 2 clinkers

Bone: 298 Shell (umbos): 5 Carbonized plants: 26

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 93 Unmod. pebbles: 49 Qtz. debitage: 9
Non-local debitage: 3 Local debitage: 84
Other: 2 chips greenstone; 3 ground greenstone; 1 petrified wood; 1 preform

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
Lubbub		1
Furrs Cordmarked		
Pickens	1	
Surface eroded		1
Grog tempered		
Baytown Plain		
Roper	15	2
Mulberry Creek Cordmarked		
Aliceville	2	
Shell tempered		
Mississippi Plain		
Warrior	490	34 (16)
Hull Lake (sand)	5	
Hull Lake (grog)	11	
Bell Plain		
Hale	8	8
Big Sandy (sand)	3	
Big Sandy (grog)	78	11
Moundville Engraved		
unspecified	2	
Carthage Incised		
Akron	1	
Carthage	4	
Moon Lake	1	
Poole	1	
unspecified	18	2
Unclassified		
Red painted	12	
White painted	8	

Type/variety	Body sherds	Rims (handles)
Red & white painted	4	
Surface eroded	4	

FS # 109 Square 164N/105E Level description 10–20 cm b.s.

Historic material: 3 glass; 1 metal

Bone: 1552 Shell (umbos): (much) Carbonized plants: (see Appendix 3)

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 202 Unmod. pebbles: 103 Qtz. debitage: 18
Non-local debitage: 9 Local debitage: 202
Other: 1 petrified wood; 4 chips greenstone; 4 proj. pt. fragments, non-diagnostic; 3 Madison points; 1 drill; 1 galena

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Unclassified	1	
Surface eroded	2	
Grog tempered		
Baytown Plain		
Roper	60	3
Tishomingo	4	
Mulberry Creek Cordmarked		
Aliceville	8	1
Salomon Brushed		
Fairfield	1	
Shell tempered		
Mississippi Plain		
Warrior	1921	128 (70)
Hull Lake (sand)	5	2
Hull Lake (grog)	52	1
Alabama River Applique		
unspecified		1
Moundville Incised		
Moundville	1	
unspecified	3	
Bell Plain		
Hale	57	9
Big Sandy (grog)	151	18
Moundville Engraved		
Wiggins	2	
Hemphill	1	
Carthage Incised		
Akron		1
Carthage	3	1
Fosters	2	5

Type/variety	Body sherds	Rims (handles)
Moon Lake	7	2
unspecified	33	7
Kimmswick Fabric Impressed	1	
Unclassified		
Red painted	55	7
White painted	27	
Red & white painted	4	1
miscellaneous	5	
Surface eroded	12	

Other: 1 small shell tempered artifact (gourd effigy ?); 1 human deciduous left upper first incisor; 1 human upper left 2nd premolar (teeth identified by Dr. C.L. Brace)

FS # 114 Square 164N/105E Level description 20 cm b.s. to floor

Bone: 332 Shell (umbos): 0 Carbonized plants: (much)

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 34 Unmod. pebbles: 27 Qtz. debitage: 6
Non-local debitage: 2 Local debitage: 56
Other: 1 soft red fine-grained stone with incised line (slate?)

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
unspecified	1	
Grog tempered		
Baytown Plain		
Roper	12	1
Tishomingo	1	
Mulberry Creek Cordmarked		
Aliceville	1	
Shell tempered		
Mississippi Plain		
Warrior	353	17 (23)
Hull Lake (sand)	5	
Bell Plain		
Hale	10	3
Big Sandy (grog)	22	3
Carthage Incised		
Carthage	4	
Moon Lake	2	
unspecified	5	
Unclassified		
Red painted	83	
White painted	1	
Red & white painted	1	
miscellaneous		1

FS # 163 Square 164N/105E Level description Mixed above and below floor

Bone: 44 Shell (umbos): frags. Carbonized plants: 29

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 4 Unmod. pebbles: 2 Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 6
Other: 1 rough sandstone discoidal

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Tishomingo	2	1
Mulberry Creek Cordmarked		
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	52	2 (1)
Hull Lake (sand)	1	
Bell Plain		
Hale	4	
Big Sandy (sand)	1	
Big Sandy (grog)	1	
Unclassified		
Red painted	1	

FS # 285 Square 164N/105E Level description Artifact on floor

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered Bell Plain Hale	1	

FS # 286 Square 164N/105E Level description Artifacts on floor

Bone: 1

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered Baldwin Plain Blubber	1	
Grog tempered Surface eroded	1	
Shell tempered Mississippi Plain Warrior	4	
Carthage Incised unspecified	1	

FS # 287 Square 164N/105E Level description Artifacts on floor

Bone: 7

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 1
Other: 1 ground sandstone

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered		
Mississippi Plain		
Warrior	9	
Bell Plain		
unspecified	1	
Carthage Incised		
Moon Lake		1

FS # 288 Square 164N/105E Level description Artifacts on floor

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered		
Mississippi Plain		
Warrior	3	1

FS # 289 Square 164N/105E Level description Artifacts on floor

Bone: 4

Daub: no Sherds (<.5in): yes

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered		
Mississippi Plain		
Warrior	7	
Bell Plain		
Big Sandy (grog)	1	

FS # 290 Square 164N/105E Level description Artifacts on floor

Bone: 4

Daub: no Sherds (<.5in): yes

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered		
Mississippi Plain		
Warrior	11	2
Bell Plain		
Hale	1	

FS # 291 Square 164N/105E Level description Artifact on floor

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered Mississippi Plain Warrior	1	

FS # 292 Square 164N/105E Level description Artifacts on floor

Lithics:
Non-local debitage: 0 Local debitage: 1

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered Mississippi Plain Warrior	4	2

FS # 85 Square 166N/105E Level description 0–10 cm b.s.

Historic material: 10 glass; 3 metal

Bone: 87 Shell (umbos): frags. Carbonized plants: 49

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 44 Unmod. pebbles: 16 Qtz. debitage: 2
Non-local debitage: 5 Local debitage: 29
Other: 2 possible ground stone

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
unspecified	1	
Grog tempered		
Baytown Plain		
Roper	5	
Shell tempered		
Mississippi Plain		
Warrior	228	17 (9)
Hull Lake (sand)	4	
Bell Plain		
Hale	20	8
Big Sandy (sand)	1	
Big Sandy (grog)	34	8
Moundville Engraved		
unspecified	1	
Carthage Incised		
Carthage	2	1
Poole	1	
unspecified	11	1
Unclassified		
Red painted	10	3
White painted	6	

FS # 85 ?? Square 166N/105E ?? Level description Provenience label nearly unreadable, but most likely additional material from FS 85

Historic material: 4 glass; 3 metal

Bone: 131 Shell (umbos): 10 Carbonized plants: 13

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 40 Unmod. pebbles: 28 Qtz. debitage: 7
Non-local debitage: 3 Local debitage: 47
Other: 2 petrified wood; 1 possible ground stone; 1 greenstone adze bit chip; 1 proj. pt. midshaft (Madison ?); 2 broken preforms

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
Grog tempered		
Baytown Plain		
Roper	13	1
Tishomingo	4	
Mulberry Creek Cordmarked		
Aliceville	1	
Tishomingo	2	
Salomon Brushed		
Fairfield	1	
Shell tempered		
Mississippi Plain		
Warrior	210	16 (15)
Hull Lake (sand)	9	2
Hull Lake (grog)	6	
Bell Plain		
Hale	21	5
Big Sandy (sand)	3	
Big Sandy (grog)	20	5
unspecified		1
Carthage Incised		
Carthage	1	
unspecified	6	1
Unclassified		
Red painted	6	1
White painted	2	
Red & white painted	2	1

FS # 91 Square 166N/105E Level description 10–20 cm b.s.

Historic material: 4 glass; 2 metal; 3 clinkers

Bone: 622 Shell (umbos): 26 Carbonized plants: 57

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 130 Unmod. pebbles: 59 Qtz. debitage: 6
Non-local debitage: 8 Local debitage: 175
Other: 1 petrified wood; 3 chips greenstone; 5 pcs. ground stone; 1 greenstone celt bit chip; 1 edge fragment from notched "palette"; 1 Flint River Spike; 1 Madison point; 5 misc. retouched pcs.; 3 drills; 1 proj. pt. midsection

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	2	
Lubbub	1	
Surface eroded	1	
Grog tempered		
Baytown Plain		
Roper	44	4
Tishomingo	3	
Mulberry Creek Cordmarked		
Aliceville		1
Salomon Brushed		
Fairfield	1	
Shell tempered		
Mississippi Plain		
Warrior	793	52 (20)
Hull Lake (sand)	22	3
Hull Lake (grog)	12	
Bell Plain		
Hale	45	3
Big Sandy (sand)	5	1
Big Sandy (grog)	59	6
Moundville Engraved		
unspecified	1	
Carthage Incised		
Fosters	1	
Moon Lake		1
unspecified	13	3
Unclassified		
Red painted	23	1

Type/variety	Body sherds	Rims (handles)
White painted	6	
Red & white painted		1
miscellaneous	9	
Unknown temper	1	

Other: 1 Mississippi Plain Warrior discoidal

FS # 97 Square 166N/105E Level description 20 cm b.s. to sediment change or floor level

Bone: 651 Shell (umbos): (lots) Carbonized plants: (lots)

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 104 Unmod. pebbles: 69 Qtz. debitage: 11
Non-local debitage: 5 Local debitage: 138
Other: 2 coal; 3 red ochre; 2 greenstone chips; 1 ground stone; 3 Madison points

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Lubbub	2	
McLeod Checkstamped		
Bigbee	1	
Surface eroded	1	
Grog tempered		
Baytown Plain		
Roper	22	2
Tishomingo	4	
Mulberry Creek Cordmarked		
Aliceville	5	2
Unclassified	2	1
Shell tempered		
Mississippi Plain		
Warrior	697	44 (15)
Hull Lake (sand)	6	1
Hull Lake (grog)	2	2
Moundville Incised		
Carrollton	1	
unspecified	1	
Bell Plain		
Hale	29	9
Big Sandy (sand)	1	
Big Sandy (grog)	42	6
Moundville Engraved		
unspecified	2	
Carthage Incised		
Carthage	4	1
Fosters		1
Moon Lake	3	
Poole	2	
unspecified	7	

Type/variety	Body sherds	Rims (handles)
Unclassified		
Red painted	23	4
White painted	7	
Surface eroded	14	

Other: 1 Mississippi Plain Warrior discoidal; 1 deer antler proj. pt.

FS # 193 Square 166N/105E Level description Top of sediment change to floor level

Bone: 405 Shell (umbos): 19 Carbonized plants: (lots)

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 33 Unmod. pebbles: 24 Qtz. debitage: 4
Non-local debitage: 0 Local debitage: 42

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	1
Furrs Cordmarked		
Pickens	1	
Grog tempered		
Baytown Plain		
Roper	8	
Tishomingo	1	
Mulberry Creek Cordmarked		
Tishomingo	1	
Unclassified	1	
Shell tempered		
Mississippi Plain		
Warrior	277	21 (3)
Bell Plain		
Hale	15	4
Carthage Incised		
unspecified	5	
Unclassified		
Red painted	6	3
White painted	5	

Other: 1 shell tempered discoidal fragment; 1 worked antler tip; 1 bone fishhook

FS # 201 Square 166N/105E Level description Artifacts pedestalled above floor

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered Mississippi Plain Warrior	17	1

FS # 207   Square 166N/105E   Level description: Artifacts from fill 2–3 cm above floor level

Bone: 80   Shell (umbos): 4   Carbonized plants: 46

Daub: yes   Sherds (<.5in): yes

Lithics:
Sandstone: 14   Unmod. pebbles: 2   Qtz. debitage: 1
Non-local debitage: 2   Local debitage: 13

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Alligator Incised		
Oxbow	1[1]	
Baytown Plain		
Roper	3	1
Tishomingo	2	
Shell tempered		
Mississippi Plain		
Warrior	79	7 (5)
Bell Plain		
Hale	6	
Big Sandy (grog)	4	
Carthage Incised		
Carthage		1
unspecified		1
Unclassified		
Red painted	3	

[1] Either Alligator Inc. Oxbow or Salomon Brushed Fairfield

FS # 267 Square 166N/105E Level description 30–40 cm b.s.

Bone: 314 Shell (umbos): 13 Carbonized plants: 68

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 65 Unmod. pebbles: 58 Qtz. debitage: 17
Non-local debitage: 12 Local debitage: 237
Other: 3 possible ground stone; 1 pc. yellow ochre; 2 unfinished bifaces; 1 proj. pt. tip; 1 flake knife or Madison point base; 1 drill; 1 (unfinished?) drill tip

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	4	
Lubbub	1	
Alexander Pinched		
Prairie Farms	1	
Grog tempered		
Baytown Plain		
Roper	55	7
Tishomingo	2	
unspecified		1
Mulberry Creek Cordmarked		
Aliceville	20	1
Tishomingo	3	
Unclassified		1
Shell tempered		
Mississippi Plain		
Warrior	208	12 (9)
Bell Plain		
Hale	10	5
Big Sandy (grog)	4	
Moundville Engraved		
unspecified	1	
Carthage Incised		
Moon Lake	1	1
unspecified	3	
Unclassified		
Red painted	6	2
miscellaneous	2	2

Other: 1 cut deer phalange; 2 Mississippi Plain Warrior discoidals

FS # 59 Square 158N/107E Level description 10–20 cm b.s.

Bone: 331 Shell (umbos): 31 Carbonized plants: 68

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 28 Unmod. pebbles: 9 Qtz. debitage: 3
Non-local debitage: 1 Local debitage: 38

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	10	1
Tishomingo	5	
Shell tempered		
Mississippi Plain		
Warrior	419	26 (14)
Hull Lake (sand)	1	
Bell Plain		
Hale	49	4
Big Sandy (sand)	1	
Big Sandy (grog)	1	
Carthage Incised		
Carthage	1	
unspecified	6	1
Unclassified		
miscellaneous		1

Other: 1 Mississippi Plain Warrior discoidal

FS # 42 Square 162N/107E Level description 0-10 cm b.s.

Historic material: 1 glass; 1 metal; 2 pottery

Bone: 52 Shell (umbos): frags. Carbonized plants: 16

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 21 Unmod. pebbles: 12 Qtz. debitage: 2
Non-local debitage: 2 Local debitage: 16
Other: 2 ground greenstone chips; 1 coal

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	2	1
Tishomingo	2	
Shell tempered		
Mississippi Plain		
Warrior	128	9 (7)
Hull Lake (grog)	6	
Bell Plain		
Big Sandy (grog)	18	3
Carthage Incised		
Moon Lake		1
unspecified	4	
Unclassified		
Red painted	6	2
White painted	2	
miscellaneous	8	
Surface eroded	3	

FS # 46 Square 162N/107E Level description 10–20 cm b.s.

Bone: 141 Shell (umbos): 6 Carbonized plants: 68

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 40 Unmod. pebbles: 22 Qtz. debitage: 3
Non-local debitage: 3 Local debitage: 49
Other: 1 crude biface

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Unclassified		1
Grog tempered		
Baytown Plain		
Roper	14	
Mulberry Creek Cordmarked		
Aliceville	1	
Shell tempered		
Mississippi Plain		
Warrior	362	24 (16)
Hull Lake (sand)	5	
Hull Lake (grog)	10	1
Bell Plain		
Hale	31	1
Big Sandy (grog)	29	4
Moundville Engraved		
Hemphill	1	
Carthage Incised		
Carthage		1
Moon Lake		1
unspecified	3	
Unclassified		
Red painted	7	2
White painted	3	
Red & white painted	1	
Surface eroded	1	

FS # 50 Square 162N/107E Level description 20–25 cm b.s.

Bone: 89 Shell (umbos): 3 Carbonized plants: 41

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 15 Unmod. pebbles: 12 Qtz. debitage: 2
Non-local debitage: 2 Local debitage: 43
Other: 1 utilized flake (non-local)

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	9	1
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	96	10 (4)
Bell Plain		
Hale	5	2
Big Sandy (grog)	2	
Unclassified		
Red painted	1	1
miscellaneous	1	1
Surface eroded	1	

FS # 259 Square 162N/107E Level description 25–30 cm b.s.

Historic material: 1 glass

Bone: 30 Shell (umbos): 1 Carbonized plants: 5

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 4 Unmod. pebbles: 12 Qtz. debitage: 2
Non-local debitage: 3 Local debitage: 38
Other: 1 drill

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Alligator Incised		
Oxbow		1
Baytown Plain		
Roper	6	
Tishomingo	1	
Mulberry Creek Cordmarked		
Aliceville	1	
Shell tempered		
Mississippi Plain		
Warrior	36	1
Hull Lake (grog)	1	
Bell Plain		
Hale	6	2
Big Sandy (sand)	1	
Big Sandy (grog)	7	
Carthage Incised		
unspecified	1	
Unclassified		
Red painted	1	
White painted	2	

FS # 272   Square 162N/107E   Level description 25–30 cm b.s.

Bone: 6   Shell (umbos): frags.   Carbonized plants: 0

Daub: yes   Sherds (<.5in): yes

Lithics:
Sandstone: 3   Unmod. pebbles: 3   Qtz. debitage:0
Non-local debitage: 0   Local debitage: 7

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	5	2
Mulberry Creek Cordmarked		
Aliceville	1	
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior		1
Unclassified		
miscellaneous		1

FS # 273 Square 162N/107E Level description 30–40 cm b.s.

Bone: 18 Shell (umbos): 3 Carbonized plants: 13

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 20 Unmod. pebbles: 15 Qtz. debitage: 1
Non-local debitage: 4 Local debitage: 68

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	2	
Grog tempered		
Baytown Plain		
Roper	21	2
Tishomingo	4	
Mulberry Creek Cordmarked		
Aliceville	1	
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	31	1 (2)
Hull Lake (grog)	1	
Bell Plain		
Hale		1[1]
Big Sandy (grog)	1	

[1] Narrow cylindrical fragment, possibly a pipe bowl?

FS # 54 Square 164N/107E Level description 0–10 cm b.s.

Historic material: 3 glass; 36 metal

Bone: 95 Shell (umbos): frags. Carbonized plants: 12

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 26 Unmod. pebbles: 6 Qtz. debitage: 1
Non-local debitage: 3 Local debitage: 27
Other: 1 drill shaft (non-local); 1 Flint River Spike (non-local); 2 ground stone

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	4	1
Mulberry Creek Cordmarked		
Aliceville	1	
Surface eroded	1	
Shell tempered		
Mississippi Plain		
Warrior	83	8 (3)
Hull Lake (sand)	1	
Hull Lake (grog)	2	
Bell Plain		
Hale	4	
Big Sandy (grog)	22	2
Carthage Incised		
unspecified	1	
Unclassified		
Red painted	2	1
White painted	2	
Red & white painted	1	
Surface eroded	3	

FS # 56 Square 164N/107E Level description 10-20 cm b.s.

Historic material: 1 glass; 2 metal

Bone: 266 Shell (umbos): 6 Carbonized plants: 66

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 26 Unmod. pebbles: 11 Qtz. debitage: 2
Non-local debitage: 0 Local debitage: 30
Other: 1 ground stone

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	3	
Tishomingo		1
Mulberry Creek Cordmarked		
Aliceville	1	
Shell tempered		
Mississippi Plain		
Warrior	236	13 (6)
Bell Plain		
Hale	9	2
Big Sandy (sand)	1	
Big Sandy (grog)	8	1
Carthage Incised		
Akron		1
Fosters		1
unspecified	7	1
Unclassified		
Red painted	3	
miscellaneous	2	

FS # 68 Square 164N/107E Level description 10–20 cm b.s. (disturbed)

Bone: 15 Shell (umbos): 1 Carbonized plants: 1

Daub: yes Sherds (<.5in): yes

Lithics:
Non-local debitage: 0 Local debitage: 2

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	1	
Shell tempered		
Mississippi Plain		
Warrior	11	2(1)
Bell Plain		
Hale		1

FS # 61 Square 164N/107E Level description 20–22 cm b.s.

Bone: 34 Shell (umbos): 2 Carbonized plants: 0

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 2 Unmod. pebbles: 1 Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 2

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered		
Mississippi Plain		
Warrior	28	3 (2)
Bell Plain		
Big Sandy (grog)	4	2

FS # 69 Square 164N/107E Level description 20–22 cm b.s.

Bone: 51 Shell (umbos): 2 Carbonized plants: 4

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 2 Unmod. pebbles: 3 Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 4

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered		
Mississippi Plain		
Warrior	38	2 (1)
Bell Plain		
Hale	4	3
Big Sandy (grog)	2	1
Unclassified		
Red painted	3	

Other: 1 Bell Plain Hale discoidal

FS # 198 Square 164N/107E Level description Artifacts pedestalled above floor

Bone: 0 Shell (umbos): 1 Carbonized plants: 0

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered		
Mississippi Plain		
Warrior	3	1

FS # 146 Square 164N/107E Level description 20–26 cm b.s.

Bone: 76 Shell (umbos): 5 Carbonized plants: 57

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 9 Unmod. pebbles: 3 Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 18

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
Lubbub	1	
Grog tempered		
Baytown Plain		
Roper	2	
Mulberry Creek Cordmarked		
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	61	5 (2)
Bell Plain		
Hale	12	1
Carthage Incised		
Carthage		1
Unclassified		
White painted	1	

Other: 2 Mississippi Plain Warrior discoidals; 1 Carthage Incised Moon Lake discoidal

FS # 205 Square 164N/107E Level description 22–26 cm b.s.

Bone: 7 Shell (umbos): frag. Carbonized plants: 0

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 3 Unmod. pebbles: 1 Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 7

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
Grog tempered		
Baytown Plain		
Roper	2	
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	4	1

FS # 206 Square 164N/107E Level description 26–35 cm b.s.

Bone: 25 Shell (umbos): frags. Carbonized plants: 4

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 12 Unmod. pebbles: 5 Qtz. debitage: 0
Non-local debitage: 1 Local debitage: 27
Other: 1 Hamilton point

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	7	1
Mulberry Creek Cordmarked		
Aliceville	1	
Shell tempered		
Mississippi Plain		
Warrior	18	1 (1)
Bell Plain		
Hale	3	
unspecified	1	
Unclassified		
Red painted		1

FS # 252 Square 164N/107E Level description 26–30 cm b.s.

Bone: 81 Shell (umbos): frags. Carbonized plants: 27

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 16 Unmod. pebbles: 17 Qtz. debitage: 4
Non-local debitage: 1 Local debitage: 67
Other: 1 Madison point base; 1 preform

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Furrs Cordmarked		
Pickens	3	
Grog tempered		
Baytown Plain		
Roper	15	
Tishomingo	1	
Mulberry Creek Cordmarked		
Aliceville	3	
Unclassified	1	
Shell tempered		
Mississippi Plain		
Warrior	82	7 (4)
Hull Lake (sand)		1
Moundville Incised		
Moundville		1
Bell Plain		
Hale	10	
Unclassified		
miscellaneous		1
Surface eroded	1	

FS # 256 Square 164N/107E Level description 30–38 cm b.s.

Bone: 34 Shell (umbos): 2 Carbonized plants: 26

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 10 Unmod. pebbles: 15 Qtz. debitage: 2
Non-local debitage: 3 Local debitage: 67
Other: 1 hammerstone fragment; 1 drill; 1 reworked proj. pt. (chisel or gouge ?)

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	2	
Grog tempered		
Baytown Plain		
Roper	19	2
Tishomingo	2	
Mulberry Creek Cordmarked		
Aliceville	3	
Shell tempered		
Mississippi Plain		
Warrior	25	0 (1)
Bell Plain		
Hale	3	
Big Sandy (grog)	1	
Carthage Incised		
unspecified	1	
Unclassified		
miscellaneous	1	

Other: 2 bone tools (proj. pts. or awls?)

FS # 277 Square 164N/107E Level description 38–44 cm b.s.

Bone: 6 Shell (umbos): 1 Carbonized plants: 18

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 8 Unmod. pebbles: 10 Qtz. debitage: 0
Non-local debitage: 2 Local debitage: 25
Other: 1 minimally retouched graver/knife; 1 Madison point base

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	2	
Mulberry Creek Cordmarked		
Aliceville	1	
Unclassified	1	
Shell tempered		
Mississippi Plain		
Warrior	8	

FS # 62 Square 166N/107E Level description 0–10 cm b.s.

Historic material: 2 glass; 1 metal

Bone: 34 Shell (umbos): frags. Carbonized plants: 3

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 15;6 Unmod. pebbles: Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 16

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	2	
Grog tempered		
Baytown Plain		
Roper	6	
Tishomingo	2	
Shell tempered		
Mississippi Plain		
Warrior	38	0 (3)
Hull Lake (sand)	2	
Hull Lake (grog)	1	
Barton Incised		
unspecified	1	
Bell Plain		
Big Sandy (sand)		1
Big Sandy (grog)	10	1
Unclassified		
Red painted	4	

FS # 65 Square 166N/107E Level description 10-20 cm b.s.

Bone: 88 Shell (umbos): 4 Carbonized plants: 23

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 35 Unmod. pebbles: 15 Qtz. debitage: 3
Non-local debitage: 3 Local debitage: 35
Other: 1 Madison point

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	9	1
Mulberry Creek Cordmarked		
Aliceville	1	
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	199	14 (3)
Bell Plain		
Hale	8	2
Big Sandy (grog)	15	1
Kimmswick Fabric Impressed	1	
Unclassified		
miscellaneous	1	

FS # 70 Square 166N/107E Level description 20–23 cm b.s.

Bone: 38 Shell (umbos): frags. Carbonized plants: 5

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 4 Unmod. pebbles: 1 Qtz. debitage: 2
Non-local debitage: 0 Local debitage: 7

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	1	
Mulberry Creek Cordmarked		
Aliceville		1
Shell tempered		
Mississippi Plain		
Warrior	25	
Bell Plain		
Hale	2	
Big Sandy (sand)	1	
Big Sandy (grog)	1	
Carthage Incised		
unspecified	3	
Surface eroded	1	

FS # 219 Square 166N/107E Level description sherd atop floor

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered		
Mississippi Plain		
Warrior	1	

FS # 72 Square 166N/107E Level description 20–23 cm b.s.

Bone: 21 Shell (umbos): 1 Carbonized plants: 5
Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 3 Unmod. pebbles: 0 Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 4

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Lubbub	1	
Grog tempered		
Baytown Plain		
Roper	2	
Tishomingo	1	
Mulberry Creek Cordmarked		
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	25	
Hull Lake (grog)	1	
Bell Plain		
Hale	5	1
Big Sandy (grog)	2	

FS # 226 Square 166N/107E Level description 23–26 cm b.s.

Bone: 3 Shell (umbos): frags. Carbonized plants: 2

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 1 Unmod. pebbles: 1 Qtz. debitage: 0 –
Non-local debitage: 0 Local debitage: 2

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered		
Mississippi Plain		
Warrior	12	2
Bell Plain		
unspecified	1	

FS # 231 Square 166N/107E Level description 24–25 cm b.s.

Bone: 4 Shell (umbos): 0 Carbonized plants: 2

Daub: yes Sherds (<.5in): yes

Lithics:
Other: 1 distal proj. pt. tip

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Unclassified	1	
Shell tempered		
Mississippi Plain		
Warrior	3	

FS # 233   Square 166N/197E   Level description 26–33 cm b.s. (N.B.: this level was dry screened)

Bone: 55   Shell (umbos): 0   Carbonized plants: 7

Daub: yes   Sherds (<.5in): yes

Lithics:
Sandstone: 33   Unmod. pebbles: 9   Qtz. debitage: 4
Non-local debitage: 0   Local debitage: 31
Other: 1 petrified wood; 1 drill tip

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	6	
Mulberry Creek Cordmarked		
Aliceville		1
Shell tempered		
Mississippi Plain		
Warrior	49	1 (3)
unspecified	1	
Moundville Incised		
unspecified	1	
Bell Plain		
Hale	2	1
Big Sandy (grog)		1
Moundville Engraved		
Hemphill	1	

FS # 262 Square 166N/107E Level description 33–42 cm b.s.

Bone: 23 Shell (umbos): 1 Carbonized plants: 10

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 24 Unmod. pebbles: 12 Qtz. debitage: 3
Non-local debitage: 1 Local debitage: 55
Other: 1 Madison point; 1 proj. pt. without base; 1 drill; 1 preform

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
Furrs Cordmarked		
Pickens	1	
Grog tempered		
Baytown Plain		
Roper	8	1
Tishomingo	3	
Mulberry Creek Cordmarked		
Aliceville	3	
Unclassified	1	
Shell tempered		
Mississippi Plain		
Warrior	21	1 (3)
Bell Plain		
Hale	2	
Big Sandy (grog)	2	

FS # 118 Square 162N/107.5E Level description 0–10 cm b.s.

Historic material: 8 glass; 4 metal; 1 pottery

Bone: 280 Shell (umbos): 4 Carbonized plants: 100

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 104 Unmod. pebbles: 62 Qtz. debitage: 4
Non-local debitage: 5 Local debitage: 102
Other: 2 unfinished or broken proj. pts.; 1 Madison point base; 1 drill; 1 utilized bladelet; 1 chip greenstone

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	2	1
Lubbub	1	
Unclassified	1	
Grog tempered		
Baytown Plain		
Roper	31	2
Mulberry Creek Cordmarked		
Aliceville	3	
Shell tempered		
Mississippi Plain		
Warrior	428	28 (18)
Hull Lake (sand)	8	
Hull Lake (grog)	16	
Bell Plain		
Hale	14	4
Big Sandy (grog)	54	6
Moundville Engraved		
unspecified	2	
Carthage Incised		
Moon Lake	1	1
unspecified	16	2
Unclassified		
Red painted	21	1
White painted	15	1
Red & white painted	2	
miscellaneous	3	
Surface eroded	2	

FS # 121 Square 162N/107.5E Level description 10-20 cm b.b.

Bone: 209 Shell (umbos): frags. Carbonized plants: 140

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 38 Unmod. pebbles: 19 Qtz. debitage: 7
Non-local debitage: 2 Local debitage: 65
Other: 1 Madison point base

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	11	
Shell tempered		
Mississippi Plain		
Warrior	415	26 (13)
Hull Lake (sand)	1	
Hull Lake (grog)	6	1
Bell Plain		
Hale	6	2
Big Sandy (grog)	31	10
Carthage Incised		
Akron		2
unspecified	11	2
Unclassified		
Red painted	2	
miscellaneous	1	
Surface eroded	4	

FS # 153 Square 162N/107.5E Level description 15–22 cm b.s.

Bone: 179 Shell (umbos): 6 Carbonized plants: 77

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 39 Unmod. pebbles: 15 Qtz. debitage: 4
Non-local debitage: 0 Local debitage: 56
Other: 2 greenstone chips

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Unclassified	1	
Grog tempered		
Baytown Plain		
Roper	9	1
Mulberry Creek Cordmarked		
Aliceville	2	1
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	382	20 (16)
Hull Lake (sand)	1	
Hull Lake (grog)	57	2
Bell Plain		
Hale	14	2
Big Sandy (grog)	27	2
Moundville Engraved		
unspecified	1	
Carthage Incised		
unspecified	4	2
Unclassified		
Red painted	6	1
White painted	2	
miscellaneous	1	
Surface eroded	7	

FS # 180 Square 162N/107.5E Level description 14–27 cm b.s.

Historic material: 1 pottery

Bone: 210 Shell (umbos): 5 Carbonized plants: 110

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 94 Unmod. pebbles: 21 Qtz. debitage: 5
Non-local debitage: 2 Local debitage: 87
Other: 1 possible ground stone

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
unspecified	1	
Tishomingo Plain		
Tishomingo	1	
Unclassified		1
Grog tempered		
Baytown Plain		
Roper	16	
Tishomingo		1
Mulberry Creek Cordmarked		
Aliceville	2	
Shell tempered		
Mississippi Plain		
Warrior	315	13 (16)
Hull Lake (sand)	2	
Hull Lake (grog)	10	
Bell Plain		
Hale	14	2
Big Sandy (grog)	22	6
Moundville Engraved		
unspecified	1	
Carthage Incised		
Carthage	2	
Fosters	1	
unspecified	3	

Type/variety	Body sherds	Rims (handles)
Unclassified		
Red painted	5	3
White painted	2	
Red & white painted	1	
Surface eroded	1	

Other: 1 fragment of a Mississippi Plain Warrior discoidal

FS # 209 Square 162N/107.5E Level description Artifacts on floor

Bone: 1 Shell (umbos): 0 Carbonized plants: 2

Daub: yes Sherds (<.5in): yes

Lithics:
Non-local debitage: 0 Local debitage: 6
Other: 1 petrified wood; 1 drill tip

Ceramics:

Type/variety	Body sherds	Rims (handles)
Shell tempered		
Mississippi Plain		
Warrior	9	1 (1)
Bell Plain		
Hale	2	

FS # 238 Square 162N/107.5E Level description 19–30 cm b.s. (N.B.: this level was dry-screened)

Bone: 96 Shell (umbos): frags. Carbonized plants: 28

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 30 Unmod. pebbles: 17 Qtz. debitage: 0
Non-local debitage: 8 Local debitage: 62
Other: 1 petrified wood; 1 small biface; 1 large, thick biface (non-local)

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
Grog tempered		
Baytown Plain		
Roper	11	1
Tishomingo	1	
Mulberry Creek Cordmarked		
Aliceville	3	
Shell tempered		
Mississippi Plain		
Warrior	152	10 (2)
Hull Lake (sand)	1	
Hull Lake (grog)	2	
Bell Plain		
Hale	15	3
Big Sandy (grog)	4	
Carthage Incised		
unspecified	1	
Unclassified		
Red painted	4	
miscellaneous	1	
Surface eroded	14	

Other: 1 bone scraper or chisel

FS # 223 Square 162N/107.5E Level description 19–30 cm b.s.

Historic material: 1 glass

Bone: 88 Shell (umbos): 2 Carbonized plants: 15

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 21 Unmod. pebbles: 13 Qtz. debitage: 1
Non-local debitage: 4 Local debitage: 41
Other: 1 petrified wood; 1 greenstone chip; 1 biface fragment (non-local)

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	9	1
Mulberry Creek Cordmarked		
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	90	9 (1)
Hull Lake (sand)	2	
Moundville Incised		
unspecified	1	
Bell Plain		
Hale	9	2
Big Sandy (grog)		2
Surface eroded	1	

FS # 269 Square 162N/107.5E Level description 19–30 cm b.s.

Bone: 20 Shell (umbos): frags. Carbonized plants: 35

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 0 Unmod. pebbles: 0 Qtz. debitage: 1
Non-local debitage: 1 Local debitage: 11

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
Grog tempered		
Baytown Plain		
Roper	1	
Shell tempered		
Mississippi Plain		
Warrior	19	0 (1)
Bell Plain		
Hale	1	
Big Sandy (grog)	1	
Unclassified		
Red painted	2	

FS # 270 Square 162N/107.5E Level description 30–40 cm b.s.

Bone: 175 Shell (umbos): 7 Carbonized plants: 22

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 117 Unmod. pebbles: 65 Qtz. debitage: 15
Non-local debitage: 22 Local debitage: 269
Other: 4 petrified wood; 8 coal; 3 red ochre; 1 galena; 2 preforms; 1 biface fragment; 2 Madison points; 1 drill; 3 utilized flakes

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Furrs Cordmarked		
Pickens	1	
Surface eroded	3	
Grog tempered		
Baytown Plain		
Roper	72	6
Tishomingo	1	
Mulberry Creek Cordmarked		
Aliceville	14	1
Tishomingo	3	
Shell tempered		
Mississippi Plain		
Warrior	181	9 (2)
Hull Lake (grog)	4	1
Bell Plain		
Hale	11	2
Big Sandy (grog)	4	1
Moundville Engraved		
unspec. (Wiggins?)	1	
Carthage Incised		
unspecified	1	
Unclassified		
Red painted	2	
Surface eroded	3	

FS # 75 Square 164N/107.5E Level description 0–10 cm b.s.

Historic material: 9 glass; 13 metal; 1 pottery; 4 clinkers

Bone: 165 Shell (umbos): 3 Carbonized plants: 110

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 118 Unmod. pebbles: 51 Qtz. debitage: 6
Non-local debitage: 3 Local debitage: 97
Other: 1 Madison point; 1 broken preform; 1 drill; 1 graver; 1 fragmentary small chunky stone; 4 ground stone fragments

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	3	
Lubbub	1	
Furrs Cordmarked		
Pickens	1	
Grog tempered		
Baytown Plain		
Roper	25	
Tishomingo	2	
Curry Creek	1	
Mulberry Creek Cordmarked		
Aliceville	4	
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	372	14 (15)
Hull Lake (sand)	6	1
Hull Lake (grog)	7	1
Moundville Incised		
unspecified	1	
Bell Plain		
Hale	28	6
Big Sandy (sand)		1
Big Sandy (grog)	56	15
Carthage Incised		
Moon Lake	1	1
unspecified	29	2

Type/variety	Body sherds	Rims (handles)
Kimmswick Fabric Impressed	1	
Unclassified		
Red painted	4	1
White painted	4	
Surface eroded	13	

Other: 1 Mississppi Plain Warrior discoidal; 1 Carthage Incised discoidal

FS # 78 Square 164N/107.5E Level description 10–20 cm b.s.

Bone: 405 Shell (umbos): 17 Carbonized plants: (lots)

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 98 Unmod. pebbles: 52 Qtz. debitage: 10
Non-local debitage: 16 Local debitage: 126
Other: 3 coal; 1 red ochre; 4 ground greenstone; 1 unworked greenstone; 1 Madison point

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Lubbub	1	
Grog tempered		
Baytown Plain		
Roper	23	1
Mulberry Creek Cordmarked		
Aliceville	4	
Shell tempered		
Mississippi Plain		
Warrior	740	36 (26)
Hull Lake (sand)	2	
Hull Lake (grog)		1
Moundville Incised		
unspecified	1	
Bell Plain		
Hale	26	8
Big Sandy (grog)	52	12
Moundville Engraved		
unspecified	1	
Carthage Incised		
Akron		1
Carthage		2
unspecified	13	1
Unclassified		
Red painted	2	2
White painted	2	
Red & white painted	3	
miscellaneous	3	3
Surface eroded	12	

Other: 1 Mississippi Plain Warrior discoidal

FS # 80 Square 164N/107.5E Level description ca. 20 cm b.s.

Bone: 93[1] Shell (umbos): 10 Carbonized plants: 79

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 26 Unmod. pebbles: 0 Qtz. debitage: 0
Non-local debitage: 2 Local debitage: 8
Other: 1 ground stone; 2 possible ground stone

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	9	
Tishomingo	3	1
Mulberry Creek Cordmarked		
Aliceville	1	
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	324	17 (5)
Hull Lake (sand)	3	1
Hull Lake (grog)	7	
Bell Plain		
Hale	20	4
Big Sandy (sand)	3	
Big Sandy (grog)	21	10
Carthage Incised		
Carthage	5	2
unspecified	6	2
Unclassified		
Red painted	7	
White painted	1	
Surface eroded	6	

[1] Not included in the bone count are the many fragments of a nearly complete turtle carapace. The count does include 4 fragments which may be from a human juvenile cranium, though this identification is uncertain.

FS # 225   Square 164N/107.5E   Level description ca. 20 cm b.s.

Bone: 23   Shell (umbos): frags.   Carbonized plants: 21

Daub: yes   Sherds (<.5in): yes

Lithics:
Sandstone: 8   Unmod. pebbles: 3   Qtz. debitage: 1
Non-local debitage: 0   Local debitage: 16

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Mulberry Creek Cordmarked		
Aliceville	1	
Shell tempered		
Mississippi Plain		
Warrior	56	2 (3)
Bell Plain		
Hale	6	
Carthage Incised		
unspecified	2	
Surface eroded	1	

FS # 172 Square 164N/107.5E Level description 18–20 cm b.s.

Bone: 54 Shell (umbos): 3 Carbonized plants: (very fragmented, moderate amount)

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 6 Unmod. pebbles: 3 Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 12

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	3	
Shell tempered		
Mississippi Plain		
Warrior	46	7 (1)
Bell Plain		
Hale	3	1
Big Sandy (grog)	2	
Carthage Incised		
unspecified	2	
Unclassified		
Red painted	1	
Surface eroded	1	

FS # 211 Square 164N/107.5E Level description Artifacts on floor

Bone: 15 Shell (umbos): 0 Carbonized plants: 6

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 2 Unmod. pebbles: 0 Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 1

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	1	
Shell tempered		
Mississippi Plain		
Warrior	31	1
Hull Lake (grog)		1
Carthage Incised		
Carthage	7	
Unclassified		
Red painted	1	

FS # 220 Square 164N/107.5E Level description 20-23 cm b.s.

Bone: 5 Shell (umbos): 0 Carbonized plants: 1

Daub: yes Sherds (<.5in): yes

Lithics:
Non-local debitage: 0 Local debitage: 2

FS # 229 Square 164N/107.5E Level description 22–30 cm b.s.

Bone: 202 Shell (umbos): 10 Carbonized plants: (moderate amount)

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 106 Unmod. pebbles: 53 Qtz. debitage: 9
Non-local debitage: 11 Local debitage: 108

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	2	
Furrs Cordmarked		
Pickens	1	
McLeod Checkstamped		
Bigbee	1	
Grog tempered		
Alligator Incised		
unspecified	2	
Baytown Plain		
Roper	25	3
Tishomingo	4	
Mulberry Creek Cordmarked		
Aliceville	3	
Tishomingo	1	
Salomon Brushed		
Fairfield	1	
Shell tempered		
Mississippi Plain		
Warrior	331	12 (6)
Bell Plain		
Hale	25	4
Moundville Engraved		
unspecified	1	
Carthage Incised		
Carthage	1	
unspecified	1	1
Unclassified		
miscellaneous	1	
Untempered		
Unclassified	1	

FS # 264 Square 164N/107.5E Level description 30–38 cm b.s.

Bone: 285 Shell (umbos): 16 Carbonized plants: 76

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 164 Unmod. pebbles: 93 Qtz. debitage: 25
Non-local debitage: 27 Local debitage: 428
Other: 5 Madison point bases; 1 miscellaneous retouched piece

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	4	
Lubbub	1	
Furrs Cordmarked		
Pickens	4	
Grog tempered		
Baytown Plain		
Roper	113	3
Tishomingo	10	2
Mulberry Creek Cordmarked		
Aliceville	8	1[1]
Tishomingo	1	
Unclassified		2
Surface eroded	1	
Shell tempered		
Mississippi Plain		
Warrior	244	14 (8)
Hull Lake (sand)	1	
Moundville Incised		
Moundville		1
Bell Plain		
Hale	20	3
Big Sandy (grog)	3	
Moundville Engraved		
unspecified	2	
Kimmswick Fabric Impressed	2	
Unclassified		
miscellaneous	3	

[1] may be Mulberry Creek Cordmarked Cochrane

FS # 279 Square 164N/107.5E Level description 38–43 cm b.s.

Bone: 31 Shell (umbos): 5 Carbonized plants: 27

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 40 Unmod. pebbles: 18 Qtz. debitage: 0
Non-local debitage: 12 Local debitage: 88
Other: 1 Madison point (unfinished?); 1 small amorphous biface

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Surface eroded	2	
Grog tempered		
Baytown Plain		
Roper	14	2
Mulberry Creek Cordmarked		
Aliceville	3	1
Shell tempered		
Mississippi Plain		
Warrior	22	
Bell Plain		
Hale	1	2
Unclassified		
Red painted	1	
Untempered		
Unclassified plain	1	

FS # 87 Square 166N/107.5E Level description 0–10 cm b.s.

Historic material:2 glass; 12 metal

Bone: 14 Shell (umbos): 0 Carbonized plants: 0

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 15 Unmod. pebbles: 11 Qtz. debitage: 0
Non-local debitage: 2 Local debitage: 21

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	9	
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	34	1 (1)
Bell Plain		
Big Sandy (grog)	4	
Carthage Incised		
Poole	1	
unspecified	2	
Unclassified		
Red painted	3	
White painted	3	
Red & white painted	1	
Surface eroded	2	

FS # 93 Square 166N/107.5E Level description 0–10 cm b.s.

Historic material:2 glass; 12 metal

Bone: 14 Shell (umbos): 0 Carbonized plants: 0

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 15 Unmod. pebbles: 11 Qtz. debitage: 0
Non-local debitage: 2 Local debitage: 21

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	9	
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	34	1 (1)
Bell Plain		
Big Sandy (grog)	4	
Carthage Incised		
Poole	1	
unspecified	2	
Unclassified		
Red painted	3	
White painted	3	
Red & white painted	1	

FS # 93 Square 166N/107.5E Level description 10–20 cm b.s.

Historic material: 2 glass; 5 metal; 1 clinker

Bone: 173[1] Shell (umbos): 7 Carbonized plants: 102

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 128 Unmod. pebbles: 70 Qtz. debitage: 6
Non-local debitage: 13 Local debitage: 142
Other: 2 possible ground stone; 1 chip greenstone; 1 fragment stone palette with red pigment adhering; 2 chips polished greenstone; 2 Madison points; 2 flake knives

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	2	
Grog tempered		
Baytown Plain		
Roper	39	3
Tishomingo	4	
Mulberry Creek Cordmarked		
Aliceville	8	1
Shell tempered		
Mississippi Plain		
Warrior	692	43 (25)
Hull Lake (sand)	10	
Hull Lake (grog)	26	
Bell Plain		
Hale	58	10
Big Sandy (sand)	5	1
Big Sandy (grog)	119	16
Carthage Incised		
Akron		2
Carthage	5	1
Fosters		1
Moon Lake		1
Poole	4	
unspecified	31	4

Type/variety	Body sherds	Rims (handles)
Unclassified		
Red painted	16	2
White painted	8	1
Red & white painted	4	3
Surface eroded	3	1

[1] Does not include teeth and multiple bone fragments from a left deer mandible

FS # 96 Square 166N/107.5E Level description 20-25 cm b.s.

Bone: 28 Shell (umbos): 3 Carbonized plants: 11

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 16 Unmod. pebbles: 7 Qtz. debitage: 1
Non-local debitage: 1 Local debitage: 35
Other: 1 petrified wood

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	1	
Mulberry Creek Cordmarked		
Aliceville	2	
Unclassified	1	
Shell tempered		
Mississippi Plain		
Warrior	103	6 (6)
Hull Lake (sand)	3	
Hull Lake (grog)	1	
Bell Plain		
Hale	13	3
Big Sandy (sand)	1	
Big Sandy (grog)	6	2
Carthage Incised		
unspecified	3	
Unclassified		
Red painted	3	1
White painted	3	

FS # 100 Square 166N/107.5E Level description 25–30 cm b.s.

Bone: 58 Shell (umbos): 4 Carbonized plants: 38

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 31 Unmod. pebbles: 22 Qtz. debitage: 2
Non-local debitage: 3 Local debitage: 53
Other: 1 possible ground stone; 1 chip ground greenstone; 1 proj. pt., cf. Swan Lake (non-local)

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
McLeod Checkstamped		
Bigbee	1	
Grog tempered		
Alligator Incised		
Oxbow	1	
unspecified	1	
Baytown Plain		
Roper	14	
Tishomingo	3	
Shell tempered		
Mississippi Plain		
Warrior	221	8 (5)
Hull Lake (sand)	5	
Hull Lake (grog)	5	
Bell Plain		
Hale	34	6
Big Sandy (grog)	19	9
Carthage Incised		
Fosters	1	
unspecified	4	1
Unclassified		
Red painted	5	1
White painted	4	1

FS # 21 Square 92N/110E Level description 0–10 cm b.s.

Historic material: 1 glass; 4 metal; coal and clinkers

Bone: 2 Shell (umbos): 0 Carbonized plants: 20

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 62 Unmod. pebbles: 55 Qtz. debitage: 11
Non-local debitage: 8 Local debitage: 266
Other: 1 utilized flake; 1 quartz biface fragment

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		4
Grog tempered		
Baytown Plain		
Roper	56	2
Shell tempered		
Mississippi Plain		
Warrior	8	
Hull Lake (grog)	2	
Surface eroded	2	

FS # 32 Square 92N/110E Level description 30–40 cm b.s.

Daub: no Sherds (<.5in): yes

Lithics:
Sandstone: 2 Unmod. pebbles: 21 Qtz. debitage: 1
Non-local debitage: 0 Local debitage: 18

Ceramics:

Type/variety	Body sherds	Rims (handles)
Fiber tempered		
Unclassified	3	
Grog tempered		
Baytown Plain		
Roper	1	1
Shell tempered		
Mississippi Plain		
Warrior	1	

FS # 83 Square 114N/125E Level description 0–10 cm b.s.

Bone: 2 Shell (umbos): 0 Carbonized plants: 0

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 0 Unmod. pebbles: 1 Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 3

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	1	
Shell tempered		
Mississippi Plain		
Warrior	1	

FS # 2 Square 115N/103E Level description 0–10 cm b.s.

Historic material: 4 glass; 3 metal; coal and clinkers

Daub: no Sherds (<.5in): yes

Lithics:
Sandstone: 3 Unmod. pebbles: 3 Qtz. debitage: 7
Non-local debitage: 0 Local debitage: 70

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Saltillo Fabricmarked		
Tombigbee	1	
Surface eroded	1	
Grog tempered		
Baytown Plain		
Roper	21	1
Mulberry Creek Cordmarked		
Aliceville		1

FS # 3 Square 115N/103E Level description 10–20 cm b.s.

Historic material: 26 glass; 5 metal

Bone: 0 Shell (umbos): 0 Carbonized plants: (little)

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 53 Unmod. pebbles: 58 Qtz. debitage: 13
Non-local debitage: 19 Local debitage: 282
Other: 1 petrified wood; 2 Madison points; 3 Madison point bases; 1 knife or preform; 1 non-local hoe flake

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	5	
Furrs Cordmarked		
Pickens	1	
Alexander Punctated		
unspecified	2	
Unclassified	8[1]	
Grog tempered		
Baytown Plain		
Roper	90	9
Tishomingo	4	
Mulberry Creek Cordmarked		
Aliceville	6	1
Unclassified		1
Shell tempered		
Mississippi Plain		
Warrior	1	

[1] Five of these are probably part of the Alexander Punctated vessel

FS # 5   Square 115N/103E   Level description 20–30 cm b.s.

Historic material: 1 glass; 3 metal

Bone: 0   Shell (umbos): 0   Carbonized plants: 12

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 44   Unmod. pebbles: 89   Qtz. debitage: 21
Non-local debitage: 12   Local debitage: 434
Other: 2 fragments of nutting stones; 3 preforms or preform fragments; 2 drill fragments; 6 projectile points or fragments

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	4	
Lubbub	2	
Unclassified	6	1
Grog tempered		
Baytown Plain		
Roper	117	3
Tishomingo	3	
Mulberry Creek Cordmarked		
Aliceville	9	
Unclassified	5	
Shell tempered		
Mississippi Plain		
Hull Lake (grog)	3	

FS # 190 Square 120N/103E Level description 10–20 cm b.s.

Historic material: 12 glass; 2 metal

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 25 Unmod. pebbles: 15 Qtz. debitage: 2
Non-local debitage: 0 Local debitage: 37

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Surface eroded	1	
Grog tempered		
Baytown Plain		
Roper	13	
Shell tempered		
Mississippi Plain		
Warrior	1	

FS # 186 Square 120N/105E Level description 10–20 cm b.s.

Historic material: 1 glass; 7 metal

Bone: 0 Shell (umbos): 0 Carbonized plants: 1

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 11 Unmod. pebbles: 12 Qtz. debitage: 2
Non-local debitage: 1 Local debitage: 17

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
McLeod Checkstamped		
Bigbee	1	
Grog tempered		
Baytown Plain		
Roper	2	

FS # 196 Square 124N/101E Level description 0–10 cm b.s.

Daub: no Sherds (<.5in): yes

Lithics:
Sandstone: 2 Unmod. pebbles: 2

FS # 197 Square 124N/101E Level description 10–20 cm b.s.

Historic material: 1 glass

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 7 Unmod. pebbles: 15 Qtz. debitage: 1
Non-local debitage: 1 Local debitage: 45

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Surface eroded	1	
Grog tempered		
Baytown Plain		
Roper	2	
Shell tempered		
Surface eroded	1	

FS # 191 Square 124N/103E Level description 0–10 cm b.s.

Daub: no Sherds (<.5in): yes

Lithics:
Sandstone: 1 Unmod. pebbles: 2 Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 3

FS # 215 Square 124N/105E Level description 0–10 cm b.s.

Historic material: 3 glass

Bone: 0 Shell (umbos): 0 Carbonized plants: 5

Daub: no Sherds (<.5in): yes

Lithics:
Sandstone: 7 Unmod. pebbles: 11 Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 19

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered Baytown Plain Roper	6	

FS # 230 Square 124N/105E Level description 10–20 cm b.s.

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 2 Unmod. pebbles: 5 Qtz. debitage: 1
Non-local debitage: 1 Local debitage: 8

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered Baldwin Plain Blubber	1	

Other: 1 grog tempered “lump”

FS # 236 Square 124N/105E Level description 10–20 cm b.s.

Historic material: 1 metal

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 0 Unmod. pebbles: 9 Qtz. debitage: 2
Non-local debitage: 0 Local debitage: 13
Other: 1 petrified wood

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
Grog tempered		
Baytown Plain		
Roper	7	
Shell tempered		
Mississippi Plain		
Warrior	1	

FS # 1 Square 133N/108E Level description 0–10 cm b.s.

Historic material: 71 glass; 3 metal; 1 clinker

Bone: 1 Shell (umbos): 0 Carbonized plants: 4

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 52 Unmod. pebbles: 42 Qtz. debitage: 5
Non-local debitage: 4 Local debitage: 106
Other: 1 projectile point stem

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	2	
Surface eroded	2	
Grog tempered		
Baytown Plain		
Roper	29	
Tishomingo	4	
Mulberry Creek Cordmarked		
Aliceville	1	1
Shell tempered		
Mississippi Plain		
Warrior	24	1 (1)
Hull Lake (sand)	1	
Bell Plain		
Hale	1	1
Big Sandy (sand)		1
Big Sandy (grog)	1	
Surface eroded	16	

FS # 13 Square 133N/108E Level description 30–40 cm b.s.

Daub: no Sherds (<.5in): yes

Lithics:
Sandstone: 5 Unmod. pebbles: 30 Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 6

FS # 99 Square 134N/128E Level description 0–10 cm b.s.

Historic material: 15 glass; 4 metal; 3 pottery; 1 ceramic doorknob

Bone: 0 Shell (umbos): 0 Carbonized plants: 1

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 25 Unmod. pebbles: 8 Qtz. debitage: 2
Non-local debitage: 1 Local debitage: 18

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Surface eroded	1	
Grog tempered		
Baytown Plain		
Roper	3	
Shell tempered		
Mississippi Plain		
Warrior	2	

FS # 101 Square 134N/128E Level description 10–20 cm b.s.

Bone: 1 Shell (umbos): 0 Carbonized plants: 14

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 44 Unmod. pebbles: 32 Qtz. debitage: 5
Non-local debitage: 1 Local debitage: 116
Other: 2 petrified wood; 1 red ochre; 2 ground greenstone flakes; 2 Madison points; 1 misc. retouched piece

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Saltillo Fabricmarked		
unspecified	1	
Unclassified	1	
Surface eroded	1	
Grog tempered		
Baytown Plain		
Roper	31	3
Tishomingo	5	
Mulberry Creek Cordmarked		
Aliceville	1	
Shell tempered		
Mississippi Plain		
Warrior	66	4
Hull Lake (grog)	1	
Bell Plain		
Hale	3	2
Big Sandy (sand)	1	
Big Sandy (grog)	9	1
Carthage Incised		
unspecified	3	
Unclassified		
Red painted	1	
Surface eroded	9	

FS # 108 Square 134N/128E Level description 30–40 cm b.s.

Bone: 0 Shell (umbos): 0 Carbonized plants: (little)

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 28 Unmod. pebbles: 13 Qtz. debitage: 7
Non-local debitage: 3 Local debitage: 21

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	2	
Lubbub	1	
Furrs Cordmarked		
Pickens	1	
Grog tempered		
Baytown Plain		
Roper	10	1
Tishomingo	1[1]	

[1] possibly ground to a discoidal

FS # 189   Square 148.5N/134E   Level description 20–30 cm b.s.

Historic material: 1 glass; 4 metal

Bone: 70   Shell (umbos): 0   Carbonized plants: 136

Daub: yes   Sherds (<.5in): yes

Lithics:
Sandstone: 334   Unmod. pebbles: 147   Qtz. debitage: 56
Non-local debitage: 39   Local debitage: 551
Other: 1 petrified wood; 1 hammerstone fragment; 1 triangular preform; 4 knife/ scrapers; 1 drill; 5 Madison point bases; 6 distal proj. pt. segments; 1 side notched proj. pt. (cf. Coosa Notched)

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	11	1
Lubbub	2	
Autauga	1	
Unclassified	1	
Surface eroded	2	
Grog tempered		
Alligator Incised		
Oxbow	1	
Baytown Plain		
Roper	162	8
Tishomingo	34	6
Mulberry Creek Cordmarked		
Aliceville	25	
Tishomingo	4	1
Salomon Brushed		
Fairfield	2	
Shell tempered		
Mississippi Plain		
Warrior	823	31 (11)
Hull Lake (sand)	18	6
Hull Lake (grog)	50	16 (3)
Bell Plain		
Hale	71	12
Big Sandy (sand)	2	26[1]
Big Sandy (grog)	61	12
Moundville Engraved		
unspecified	1	
Carthage Incised		

Type/variety	Body sherds	Rims (handles)
Akron	2	
Carthage		1
Fosters	1	
Poole	1	
unspecified	24	1
Kimmswick Fabric Impressed	1	
Unclassified		
Red painted	12	1
White painted	11	

[1] Includes 8 rim sherds from small hemispherical bowl with inward-facing feline (?) effigy

Other: 1 Mississippi Plain Hull Lake (grog) discoidal; 1 Bell Plain Hale discoidal; 1 shell tempered, red painted discoidal

FS # 161 Square 150.5N/134E Level description 0–10 cm b.s.

Historic material: 6 glass; parts of a tin can; clinkers

Bone: 0 Shell (umbos): 0 Carbonized plants: yes 3

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 2 Unmod. pebbles: 4 Qtz. debitage: 1
Non-local debitage: 0 Local debitage: 6

FS # 162 Square 150.5N/134E Level description 10–20 cm b.s.

Historic material: 17 glass; 23 metal

Bone: 0 Shell (umbos): 0 Carbonized plants: 5

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 14 Unmod. pebbles: 5 Qtz. debitage: 2
Non-local debitage: 0 Local debitage: 29
Other: 1 possible greenstone chip

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	1	
Tishomingo	2	
Mulberry Creek Cordmarked		
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	12	2
Bell Plain		
Hale		1
Big Sandy (sand)	2	
Big Sandy (grog)		1
Unclassified		
Red painted	1	
White painted	3	

FS # 135 Square 150.5N/135E Level description 20–30 cm b.s.

Bone: 11 Shell (umbos): 0 Carbonized plants: 26

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 77 Unmod. pebbles: 45 Qtz. debitage: 16
Non-local debitage: 0 Local debitage: 151
Other: 1 proj. pt. or drill tip

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
unspecified	1	
Grog tempered		
Baytown Plain		
Roper	43	2
Mulberry Creek Cordmarked		
Aliceville	4	
Tishomingo	1	
Shell tempered		
Mississippi Plain		
Warrior	79	9 (3)
Hull Lake (grog)	8	
Bell Plain		
Hale	6	
Big Sandy (grog)	19	
Unclassified		
Red painted	3	1
White painted	4	
Surface eroded	6	1

FS # 120 Square 151N/134E Level description 0–10 cm b.s.

Historic material: 3 glass; 4 metal

Daub: yes Sherds (<.5in): yes

FS # 122 Square 151N/134E Level description 10–20 cm b.s.

Historic material: 22 glass; 38 metal

Bone: 10 Shell (umbos): 0 Carbonized plants: 23

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 77 Unmod. pebbles: 17 Qtz. debitage: 10
Non-local debitage: 4 Local debitage: 66
Other: 1 petrified wood; 1 proj. pt. midsection

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	9	1
Tishomingo	6	1
Shell tempered		
Mississippi Plain		
Warrior	77	3 (1)
Hull Lake (sand)	2	
Hull Lake (grog)	15	3
Bell Plain		
Hale	3	2
Big Sandy (sand)	5	
Big Sandy (grog)	16	4
Carthage Incised		
Poole	1	
unspecified	1	1
Unclassified		
Red painted	3	
White painted		1

FS # 126 Square 151N/134E Level description 30–40 cm b.s.

Historic material: 3 metal

Bone: 11 Shell (umbos): 0 Carbonized plants: 16

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 29 Unmod. pebbles: 31 Qtz. debitage: 5
Non-local debitage: 0 Local debitage: 66

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
Grog tempered		
Baytown Plain		
Roper	23	1
Tishomingo	4	
Mulberry Creek Cordmarked		
Aliceville	1	
Shell tempered		
Mississippi Plain		
Warrior	47	3 (1)
Bell Plain		
Big Sandy (grog)	2	
Unclassified		
White painted	2	

FS # 142 Square 151N/135E Level description 10–20 cm b.s.

Historic material: 12 glass; 24 metal; 1 pottery

Bone: 1 Shell (umbos): 0 Carbonized plants: 12

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 51 Unmod. pebbles: 23 Qtz. debitage: 11
Non-local debitage: 0 Local debitage: 62
Other: 1 possible ground stone; 2 Madison points; 1 crude tringular point; 1 drill midsection; 1 biface midsection (non-local)

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	16	
Tishomingo	2	
Mulberry Creek Cordmarked		
Aliceville	3	
Shell tempered		
Mississippi Plain		
Warrior	93	3 (3)
Hull Lake (sand)	2	
Hull Lake (grog)	4	
Bell Plain		
Hale	1	
Big Sandy (grog)	18	
Carthage Incised		
unspecified	5	4
Unclassified		
Red painted	1	
White painted	1	
Red & white painted	2	
miscellaneous	1	
Surface eroded	7	

FS # 9 Square 153N/109E Level description 0–10 cm b.s. (disturbed in south half)

Historic material: 3 glass; 7 metal

Bone: 156 Shell (umbos): frags. Carbonized plants: 4

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 34 Unmod. pebbles: 32 Qtz. debitage: 2
Non-local debitage: 2 Local debitage: 30
Other: 3 petrified wood; some pieces of mica

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
Grog tempered		
Baytown Plain		
Roper	18	
Tishomingo		1
Mulberry Creek Cordmarked		
Tishomingo	1	
Salomon Brushed		
Fairfield	1	
Shell tempered		
Mississippi Plain		
Warrior	62	4
Hull Lake (sand)	3	
Bell Plain		
Hale	5	
Big Sandy (grog)	8	3
unspecified	2	
Unclassified		
Red painted	2	1

[1] Does not include 11 human teeth and mandibular symphysis found in top few centimeters of southwest quadrant; probably from spoil dirt from road construction. Much of the bone count is probably unidentifiable human bone.

FS # 11   Square 153N/109E   Level description 10–20 cm b.s. (disturbed in south half)

Historic material: 21 glass; 4 metal; 9 pottery

Bone: 7   Shell (umbos): frags.   Carbonized plants: 49

Daub: yes   Sherds (<.5in): yes

Lithics:
Sandstone: 38   Unmod. pebbles: 36   Qtz. debitage: 8
Non-local debitage: 7   Local debitage: 88
Other: 1 ground sandstone; 1 proximal segment Madison point; 1 Madison point (non-local)

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	13	
Shell tempered		
Mississippi Plain		
Warrior	90	1 (1)
Hull Lake (grog)	6	
Bell Plain		
Hale	9	2
Big Sandy (grog)	7	
Moundville Engraved		
unspecified	1	
Carthage Incised		
unspecified	3	1
Unclassified		
Red painted	4	1
White painted	2	

FS # 23 Square 153N/109E Level description 20–30 cm b.s. (undisturbed part of unit)

Bone: 8 Shell (umbos): 0 Carbonized plants: 79

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 39 Unmod. pebbles: 17 Qtz. debitage: 0
Non-local debitage: 4 Local debitage: 58
Other: 1 possible ground stone; 1 chip of greenstone celt/adze bit

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Lubbub	1	
Grog tempered		
Baytown Plain		
Roper	10	
Tishomingo	2	
Mulberry Creek Cordmarked		
Aliceville	2	
Shell tempered		
Mississippi Plain		
Warrior	139	3 (1)
Hull Lake (sand)	3	
Hull Lake (grog)	18	
Bell Plain		
Hale	16	4
Big Sandy (grog)	5	
Carthage Incised		
Moon Lake		1
unspecified	2	
Unclassified		
Red painted	3	
White painted	3	
miscellaneous	2	

FS # 64 Square 168N/94E Level description 0–10 cm b.s.

Historic material: fragments of glass bottle; sheet iron; brick and tile; 1 unfired .22 caliber cartridge; etc.

Bone: 0 Shell (umbos): 0 Carbonized plants: 11

Daub: yes Sherds (<.5in): yes

Lithics:
Sandstone: 21 Unmod. pebbles: 33 Qtz. debitage: 1
Non-local debitage: 5 Local debitage: 46
Other: 1 possible ground stone

Ceramics:

Type/variety	Body sherds	Rims (handles)
Sand tempered		
Baldwin Plain		
Blubber	1	
Grog tempered		
Baytown Plain		
Roper	7	
Shell tempered		
Mississippi Plain		
Warrior	68	7 (1)
Bell Plain		
Hale	2	
Big Sandy (grog)	11	3
Carthage Incised		
unspecified	1	
Surface eroded	17	1

FS # 82 Square 168N/94E Level description 40–45 cm b.s.

Bone: 1 Shell (umbos): 0 Carbonized plants: 0

Daub: yes Sherds (<.5in): no

Lithics:
Sandstone: 2 Unmod. pebbles: 11 Qtz. debitage: 0
Non-local debitage: 0 Local debitage: 5

Ceramics:

Type/variety	Body sherds	Rims (handles)
Grog tempered		
Baytown Plain		
Roper	1	
Shell tempered		
Mississippi Plain		
Warrior	1	

APPENDIX B

FAUNAL MATERIAL

Faunal material (excluding molluscs) from the 1983 excavations at the White site was analyzed by Scott Blanchard. The analysis was designed to meet three specific goals: (1) provide bone counts and weights by gross taxonomic category (bird, fish, large mammal, etc.); (2) provide counts and weights of deer and unidentified large mammal bone by skeletal part; (3) identify small mammal bone to species when possible. Only material from the excavations in the area of the late Moundville III refuse deposit was analyzed, since preservation elsewhere at the site was very poor. These data are presented in the following tables.

The tables are arranged in three sets. The first set presents counts and weights of bone by gross taxonomic category for each FS unit that contained faunal remains. The second set of tables presents the counts and weights of deer and unidentified large mammal bone for each FS unit that contained such remains. The final set of tables lists the counts and weights of small mammal bones for each FS unit in which such taxa were present.

Counts and weights of bone by gross taxonomic category

Provenience	Large mammal		Small mammal		Bird		Turtle		Snake		Fish		Total ident.	Unident.
	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	Wt. (g)	Wt. (g)
162N/105E														
123	62	37.56	3	2.08	4	1.21	1	.16	0	0	1	.32	41.33	5.87
127	30	132.54	13	7.19	10	3.35	19	6.59	4	1.40	8	1.48	152.55	83.11
133	36	62.75	5	4.65	6	6.16	10	2.60	1	.15	6	.94	77.25	44.11
253	19	22.00	2	1.38	4	2.22	6	2.22	0	0	0	0	27.82	0
261	46	38.10	11	2.75	2	1.03	4	1.40	1	.07	8	.91	44.26	8.23
164N/105E														
104	44	44.15	4	.67	4	2.89	19	5.45	3	.35	0	0	53.51	47.44
109	285	400.97	17	12.06	42	21.80	100	55.99	20	3.12	39	6.62	500.56	227.60
114	51	106.82	9	11.54	13	5.00	15	11.77	3	.59	11	3.00	138.72	55.35
163	5	23.22	0	0	1	.18	1	.21	0	0	0	0	23.61	8.74
287	7	32.73	0	0	0	0	0	0	0	0	0	0	32.73	0
289	1	7.49	0	0	0	0	3	4.81	0	0	0	0	12.30	0
290	0	0	0	0	0	0	4	12.21	0	0	0	0	12.21	0
166N/105E														
85	16	50.06	3	1.27	6	7.13	4	1.14	0	0	3	.32	59.92	0
91	109	138.84	17	4.63	7	4.79	22	12.51	5	1.20	7	1.21	163.18	90.09
97	186	227.76	7	6.10	36	14.59	76	32.39	5	.39	25	2.97	284.20	62.72
193	39	100.75	24	13.00	15	5.07	35	34.75	4	.63	11	1.26	155.46	71.06
207	16	46.83	0	0	3	1.72	10	2.04	0	0	5	.62	51.21	11.60
267	54	94.73	20	26.34	8	3.21	32	2.94	4	.61	11	2.76	130.59	44.34
158N/107E														
59	47	63.65	11	3.39	4	1.42	14	3.73	5	.58	1	.12	72.89	56.92
162N/107E														
42	11	6.14	0	0	0	0	0	0	0	0	0	0	6.14	7.82
46	19	22.08	3	.87	0	0	6	.26	1	.98	0	0	24.19	25.31
50	8	9.34	6	7.39	2	2.38	12	2.18	0	0	2	.32	21.61	15.16
259	9	21.60	3	1.11	0	0	4	1.01	0	0	0	0	23.72	6.54
272	0	0	0	0	0	0	0	0	0	0	0	0	0	1.29
273	4	4.95	0	0	0	0	0	0	0	0	0	0	4.95	3.43
164N/107E														
54	26	18.99	2	1.70	2	1.70	0	0	0	0	29	3.39	25.78	2.73
56	47	104.29	5	1.93	4	1.13	7	1.45	1	.11	4	.39	109.30	3.50

Bone by gross taxonomic category (continued)

Provenience	Large mammal		Small mammal		Bird		Turtle		Snake		Fish		Total ident.	Unident.
	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	Wt. (g)	Wt. (g)
68	3	16.37	0	0	0	0	1	.59	0	0	1	.06	17.02	3.43
61	15	15.40	0	0	0	0	0	0	0	0	1	0	15.40	2.54
69	4	44.63	20	4.45	0	0	3	1.66	1	.30	1	.13	51.17	5.06
146	12	20.23	2	.67	6	2.81	2	.70	0	0	0	0	24.41	16.12
205	0	0	0	0	0	0	0	0	0	0	0	0	0	3.20
206	4	4.45	0	0	0	0	2	.28	0	0	1	.17	4.90	4.17
252	13	17.13	2	.42	3	.75	19	7.42	0	0	1	.18	25.90	7.89
256	5	4.70	1	.18	0	0	3	1.67	0	0	2	.50	7.05	5.04
277	1	2.69	0	0	0	0	0	0	0	0	0	0	2.69	.78
166N/107E														
62	4	5.73	0	0	0	0	0	0	0	0	0	0	5.73	8.23
65	19	50.30	0	0	3	1.94	4	1.90	0	0	4	.73	54.87	11.89
70	3	7.04	1	.38	0	0	6	1.19	0	0	3	.31	8.92	4.47
72	3	3.71	0	0	0	0	1	.05	0	0	1	.05	3.81	2.90
226	0	0	0	0	0	0	1	.05	0	0	0	0	.05	.96
231	0	0	0	0	0	0	0	0	0	0	0	0	0	.88
233	15	33.59	0	0	0	0	1	6.50	0	0	0	0	40.09	8.74
262	2	1.44	0	0	0	0	8	2.58	0	0	0	0	4.02	3.62
162N/107.5E														
118	17	31.42	5	2.95	2	.86	11	4.83	0	0	1	.12	40.18	64.19
121	18	21.17	1	.36	0	0	8	1.87	0	0	0	0	23.40	45.04
153	14	15.80	5	2.64	4	2.69	16	4.65	0	0	1	.10	25.88	31.56
180	14	47.33	9	2.11	7	4.18	15	5.54	3	.29	3	.30	59.75	39.56
209	0	0	0	0	0	0	0	0	0	0	0	0	0	.28
238	17	51.08	1	.29	8	8.83	12	3.69	0	0	2	.22	64.11	15.21
223	16	24.87	1	.23	4	1.90	4	.87	0	0	0	0	27.87	16.65
269	1	.35	1	.40	0	0	5	1.40	1	.24	3	.97	3.36	1.54
270	44	79.71	5	3.24	3	.58	27	8.74	1	.10	3	.51	92.88	3.55
164N/107.5E														
75	25	22.33	2	.91	0	0	4	1.20	0	0	1	.09	24.53	26.95
78	67	196.95	8	2.53	0	0	19	3.81	8	.91	10	1.70	205.90	47.20
80	18	45.06	0	0	10	7.50	6	34.21	0	0	0	0	86.77	1.40
225	4	3.49	0	0	1	.08	2	.21	0	0	1	.08	3.86	4.09
172	10	31.66	1	1.50	0	0	3	1.68	0	0	1	.15	34.99	8.39
211	3	14.86	0	0	0	0	4	3.16	0	0	1	.56	18.58	2.20
220	2	1.72	0	0	0	0	0	0	0	0	0	0	1.72	0

Bone by gross taxonomic category (continued)

Provenience	Large mammal		Small mammal		Bird		Turtle		Snake		Fish		Total ident.	Unident.
	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	Wt. (g)	Wt. (g)
229	45	67.28	7	2.10	8	6.09	5	1.43	5	.51	7	1.34	78.75	30.72
264	33	47.47	7	1.64	15	4.46	18	5.97	2	.41	9	1.79	61.74	46.47
279	3	6.19	0	0	4	1.67	0	0	0	0	0	0	7.86	5.75
166N/107.5E														
87	1	1.08	0	0	0	0	3	1.00	0	0	0	0	2.08	2.69
93	41	69.29	2	.71	1	.28	4	1.28	0	0	0	0	71.56	23.30
96	6	14.98	1	.03	2	.72	0	0	1	.08	0	0	15.81	5.33
100	6	2.25	3	.55	0	0	0	0	0	0	3	.11	2.91	7.75

Counts and weights of deer/large mammal bone by anatomical unit

Provenience	Skull		Axial		Forelimb		Hindlimb		Feet		Wt. unid. (g)
	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g))	No.	Wt. (g)	
162N/107.5E											
123	7	3.10	0	0	0	0	1	5.14	1	1.43	27.89
127	4	3.01	3	10.54	1	6.11	0	0	5	23.24	89.64
133	2	3.62	1	4.24	2	7.45	1	6.64	5	5.32	35.48
253	2	.46	0	0	0	0	0	0	0	0	21.54
261	13	6.80	0	0	0	0	0	0	2	1.16	30.14
164N/105E											
104	4	3.70	0	0	0	0	0	0	1	7.90	36.25
109	10	4.39	16	31.02	5	7.42	9	112.08	16	38.08	207.26
114	0	0	11	8.36	0	0	3	39.13	3	8.77	50.56
163	0	0	0	0	2	18.43	0	0	0	0	4.79
287	0	0	0	0	0	0	7	32.73	0	0	0
289	0	0	0	0	0	0	1	7.49	0	0	0
166N/105E											
85	0	0	0	0	1	17.87	0	0	1	.62	31.57
91	6	7.31	11	15.45	1	4.74	1	20.51	6	4.75	86.06
97	12	11.99	14	36.20	1	13.90	4	37.15	12	23.67	104.85
193	3	2.36	6	9.14	0	0	1	8.90	9	32.59	47.76
207	1	1.35	5	20.63	0	0	0	0	2	3.38	21.47
267	5	2.68	2	.70	0	0	2	6.87	7	48.49	35.99
158N/107E											
59	15	10.42	5	7.48	1	11.11	0	0	6	8.24	26.40
162N/107E											
42	0	0	0	0	0	0	0	0	1	.23	5.91
46	2	.38	1	2.19	0	0	0	0	2	1.40	18.11
50	0	0	2	3.59	0	0	0	0	0	0	5.75
259	0	0	5	16.48	1	1.40	0	0	3	3.72	0
273	1	.71	0	0	0	0	0	0	0	0	4.24
164N/107E											
54	1	.22	0	0	1	1.78	0	0	1	2.93	14.06
56	0	0	3	4.60	0	0	4	62.18	4	7.65	29.87
68	0	0	1	14.01	0	0	0	0	0	0	2.36
61	0	0	0	0	0	0	0	0	6	5.60	9.80

Deer/large mammal bone (continued)

Provenience	Skull		Axial		Forelimb		Hindlimb		Feet		Wt. unid. (g)
	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g))	No.	Wt. (g)	
69	0	0	1	2.09	0	0	1	35.93	1	4.99	1.35
146	0	0	1	3.21	0	0	0	0	1	2.67	14.35
206	1	.31	0	0	0	0	0	0	1	1.48	2.66
252	1	.20	0	0	1	3.60	0	0	2	12.19	1.74
256	0	0	1	1.32	0	0	0	0	0	0	3.38
277	0	0	0	0	0	0	0	0	1	2.69	0
166N/107E											
62	1	2.80	3	5.45	0	0	0	0	0	0	0
65	2	.36	2	18.02	1	12.84	0	0	1	7.88	11.20
70	0	0	3	7.04	0	0	0	0	0	0	0
72	0	0	1	.69	0	0	0	0	1	.86	2.16
233	0	0	3	3.39	1	5.58	1	1.72	4	11.07	11.83
262	0	0	1	.35	0	0	0	0	1	1.09	0
162N/107.5E											
118	3	6.99	0	0	0	0	0	0	2	6.39	18.04
121	0	0	0	0	0	0	0	0	2	.56	20.61
153	1	4.42	1	.83	0	0	0	0	0	0	10.55
180	4	1.51	1	2.25	1	36.34	0	0	2	.65	6.58
238	0	0	1	1.16	2	13.32	0	0	4	2.42	34.18
223	0	0	0	0	1	5.80	0	0	2	2.17	16.90
269	0	0	1	.35	0	0	0	0	0	0	0
270	1	2.49	1	1.66	0	0	4	34.08	2	5.72	35.76
164N/107.5E											
75	1	.89	0	0	0	0	0	0	5	4.12	17.32
78	5	2.17	7	35.64	1	7.44	3	67.25	4	32.04	52.42
80	1	2.80	1	9.42	2	5.44	1	4.98	0	0	22.42
225	0	0	0	0	0	0	0	0	0	0	3.49
172	0	0	2	1.89	0	0	1	16.03	1	1.22	12.52
211	0	0	1	1.37	1	5.00	0	0	0	0	8.49
220	0	0	0	0	0	0	0	0	0	0	1.72
229	3	1.92	7	5.72	1	9.10	0	0	3	1.64	48.90
264	3	1.27	2	1.37	0	0	0	0	2	5.07	39.76
279	0	0	0	0	0	0	0	0	0	0	6.19
166N/107.5E											
87	0	0	0	0	0	0	0	0	1	1.08	0

Deer/large mammal bone (continued)

Provenience	Skull		Axial		Forelimb		Hindlimb		Feet		Wt. unid. (g)
	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g))	No.	Wt. (g)	
93	11	18.38	1	.96	1	11.52	0	0	6	18.96	19.47
96	1	1.56	0	0	0	0	0	0	0	0	13.42
100	0	0	0	0	0	0	0	0	0	0	2.25

Counts of small mammal bones by provenience unit

Provenience: 162N/105E L.1 FS #: 123

Castor canadensis 1
Procyon lotor 1

Provenience: 162N/105E L.2 FS #: 127

Didelphis marsupialis 4
Procyon lotor 1
Sylvilagus aquaticus 2
Sylvilagus floridanus 2
unidentified 2

Provenience: 162N/105E L.3 FS #: 133

Canis sp. 2
Sciurus carolinensis 1
unidentified 2

Provenience: 162N/105E L.4 FS #: 253

Procyon lotor 2

Provenience: 162N/105E L.4 FS #: 261

Canis sp. 1
Didelphis marsupialis 3
Procyon lotor 1
Sciurus carolinensis 4
Sylvilagus aquaticus 1
unidentified 1

Provenience: 164N/105E L.1 FS #: 104

Canis sp. 1
Didelphis marsupialis 1
Sciurus carolinensis 1

Provenience: 164N/105E L.2 FS #: 109

Canis sp. 3
Didelphis marsupialis 3
Procyon lotor 2
Sylvilagus aquaticus 1
Sylvilagus floridanus 1
Sylvilagus sp. 1
cf. Vulpes fulva 2
unidentified 4

Provenience: 164N/105E L.3 FS #: 114

Canis sp. 4
Procyon lotor 3
Sciurus sp. 1
unidentified rodent 1

Provenience: 166N/105E L.3 FS #: 97

Canis sp. 1
Sciurus carolinensis 1
Sciurus sp. 1
Sylvilagus aquaticus 2
unidentified rodent 1
unidentified 1

Provenience: 166N/105E L.5 FS #: 267

Canis sp. 5
Didelphis marsupialis 2
Procyon lotor 3
Sciurus carolinensis 1
Sylvilagus aquaticus 1
Sylvilagus floridanus 1
Sylvilagus sp. 1

Provenience: 164N/107E L.1 FS #: 54

unidentified 2

Provenience: 164N/107E L.2 FS #: 56

Didelphis marsupialis 2
Sciurus carolinensis 1
Sylvilagus aquaticus 1
unidentified 1

Provenience: 164N/107E L.3 FS #: 69

Sylvilagus aquaticus 1
cf. Sylvilagus aquaticus 19

Provenience: 164N/107E L.5 FS #: 146

Procyon lotor 1
Sylvilagus floridanus 1

Provenience: 164N/107E L.11 FS #: 252

Sylvilagus floridanus 2

Provenience: 164N/107E L.12 FS #: 256

Sciurus sp. 1

Provenience: 162N/107.5E L.2 FS #: 121

Procyon lotor 1

Provenience: 162N/107.5E L.3 FS #: 153

Procyon lotor 1
Sylvilagus sp. 1

Provenience: 162N/107.5E L.12 FS #: 223

Sylvilagus aquaticus 1

Provenience: 162N/107.5E L.12 FS #: 238

unidentified 1

Provenience: 162N/107.5E L.13 FS #: 269

Sciurus carolinensis 1

Provenience: 162N/107.5E L.14 FS #: 270

Sus scrofa 1
Sylvilagus floridanus 2
unidentified 2

Provenience: 164N/107.5E L.1 FS #: 75

Procyon lotor 2

Provenience: 164N/107.5E L.2 FS #: 78

Didelphis marsupialis 2
Procyon lotor 2
Sylvilagus aquaticus 1
Sylvilagus sp. 1

Provenience: 164N/107.5E L.4 FS #: 172

Didelphis marsupialis 1

Provenience: 164N/107.5E L.13 FS #: 229

Procyon lotor 1
Sciurus carolinensis 2
Sciurus niger 2
Sylvilagus aquaticus 1
unidentified 1

Provenience: 164N/107.5E L.14 FS #: 264

Didelphis marsupialis 1
Sciurus carolinensis 1
Sciurus sp. 1
Sylvilagus aquaticus 3
unidentified 1

Provenience: 166N/107.5E L.3 FS #: 96

Didelphis marsupialis 1

APPENDIX C

BOTANICAL SAMPLES

Thirteen samples of carbonized botanical remains from the 1983 excavations at the White site were analyzed by Margaret Scarry. The analyzed samples included three flotation samples from above the structure floor (164N/105E L.1, 2, 3), four flotation samples of lenses within the floor deposit (164N/107E L.6, 7, 8, 9), and a flotation sample from each of two features filled with charred maize cobs (Fea. 22 west half, 168N/94E; Fea. 56, 162N/105E). Carbonized botanical remains from the 1/4 inch waterscreen material from 164N/105E L.2, and from flotation samples from three West Jefferson phase features were also analyzed.

The samples from above the floor and from the three West Jefferson phase features were floated in the field with a modified SMAP-type flotation barrel, with the light fraction caught on a cloth diaper. The heavy fraction, retained on 1/16 inch screen, was subsequently examined and all charred botanical material (mostly hickory nutshell) transferred to the light fraction. The flotation samples from the floor and the two cob-filled pits were processed in the laboratory. Each sample was rinsed through nested 2 mm and 0.5 mm geological sieves. Botanical material from the 2 mm fraction was removed by hand, and the 0.5 mm fraction was floated to separate the botanical material from non-botanical material. Since the flotation did not remove all the botanical material from the 0.5 mm fraction, both the light and heavy fractions were submitted for analysis.

Scarry used the same laboratory procedures for these samples as for the samples used in her study (1986) of West Jefferson phase – Moundville I phase subsistence change. All botanical material was screened through 1.4 mm mesh. Material other than charcoal and seeds retained on the 1.4 mm screen was identified to genus (when possible), and the number and aggregate weight of items by taxon was recorded. The fine fraction (< 1.4 mm) was sorted to remove seeds. All seeds were identified to genus when possible and the counts by taxon were recorded. When sufficient material was present, 20 pieces of charcoal (19 for Fea. 8, 92N/110E) from the coarse fraction were identified to genus if possible.

These data, along with information about the sample volume, weight, processing technique, etc., are presented in the following tables.

Provenience: 164N/105E L.1 FS #: 105
Type of deposit: Moundville III midden
Type of sample: 6 liter flot. Processed in: field
Sample weight (incl. contamination): 18.59 g Weight of plant remains <1.4 mm: 1.52 g

Identification	>1.4 mm	
	No.	Wt. (g)
Carya nutshell	64	40.00
Quercus nutshell	7	<.01
Acorn nutmeats	1	<.01
Wood charcoal	–	0.64
Zea mays kernels	15	.01
" " cupules	26	.06
Insect galls	2	–

Provenience: 164N/105E L.2 FS #: 112
Type of deposit: Moundville III midden
Type of sample: 6 liter flot. Processed in: field
Sample weight (incl. contamination): 26.58 g Weight of plant remains <1.4 mm: 9.54 g

Identification	>1.4 mm	
	No.	Wt. (g)
Carya nutshell	99	1.05
Quercus nutshell	116	0.18
Acorn nutmeats	61	1.54
Wood charcoal	–	5.59
Zea mays kernels	45	.13
" " cupules	161	.79
" " cobs & frags.	1	<.01
Insect galls	6	–

Seed identifications:

Diospyros; 14
Ilex cf. verticilliata; 2
Phalaris; 2
Phytolacca; 4
Poaceae unid. type 1; 1
Poaceae unid. type 2; 2
Vitis; 1
Unidentifiable; 21

Wood identifications:

Acer; 1
Pinus; 14
Quercus (white); 2
Zea mays; 3

Provenience: 164N/105E L.2 FS #: 109
Type of deposit: Moundville III midden
Type of sample: 1/4 inch screen Processed in: field
Sample weight (incl. contamination): 35.95 g Weight of plant remains <1.4 mm: 34.16 g

Identification	>1.4 mm	
	No.	Wt. (g)
Carya nutshell	138	8.61
Acorn nutmeats	121	11.71
Wood charcoal	–	12.72
Zea mays kernels	6	.09
" " cupules	3	.15
" " cobs & frags.	1 frag.	–

Seed identifications:

Diospyros; 4

Wood identifications:

Diospyros; 1
Fraxinus; 1
Liquidambar; 1
Pinus; 14
Quercus (red); 2
Ulmus; 1

Provenience: 164N/105E L.3 FS #: 115
Type of deposit: Moundville III midden
Type of sample: 6 liter flot. Processed in: field
Sample weight (incl. contamination): 33.45 g Weight of plant remains <1.4 mm: 13.74 g

Identification	>1.4 mm	
	No.	Wt. (g)
Carya nutshell	179	1.83
Quercus nutshell	350	.58
Acorn nutmeats	58	.79
Wood charcoal	–	9.45
Zea mays kernels	39	.13
" " cupules	107	.31
Insect galls	4	

Seed identifications:

Diospyros; 21
Ilex cf. vomitoria; 1
Oxalis; 1
Passiflora; 1
Phalaris; 1
Poaceae unid. type 1; 4
Poaceae unid. type 2; 1
Rhus; 1
Unidentified; 1
Unidentifiable; 6

Wood identifications:

Carya; 1
Liquidambar; 1
Pinus; 16
Quercus (white); 1

Provenience: 164N/107E L.6 FS #: 199
Type of deposit: Moundville III floor
Type of sample: 2 liter flot. Processed in: lab
Sample weight (incl. contamination): 163.04 g Weight of plant remains <1.4 mm: 2.36 g

Identification	>1.4 mm	
	No.	Wt. (g)
Carya nutshell	42	.49
Quercus nutshell	185	.32
Wood charcoal	–	.53
Zea mays kernels	6	.01
" " cupules	16	.02

Seed identifications:

Celtis; 2 (uncarbonized)
Diospyros; 4
Passiflora; 5
Poaceae unid. type 1; 3
Poaceae unid. type 2; 2
Unidentifiable; 1

Provenience: 164N/107E L.7 FS #: 203
Type of deposit: Moundville III floor
Type of sample: 1.5 liter flot. Processed in: lab
Sample weight (incl. contamination): 11.44 g Weight of plant remains <1.4 mm: 3.14 g

Identification	>1.4 mm	
	No.	Wt. (g)
Carya nutshell	151	1.25
Quercus nutshell	127	.18
Wood charcoal	–	1.39
Zea mays kernels	3	<.01
" " cupules	6	<.01

Seed identifications:

Diospyros; 17
Phalaris; 1
Poaceae unid. type 1; 5
Unidentifiable; 7

Provenience: 164N/107E L.8 FS #: 204
Type of deposit: Moundville III floor
Type of sample: 3.25 liter flot Processed in: lab
Sample weight (incl. contamination): 14.31 g Weight of plant remains <1.4 mm: 5.76 g

Identification	>1.4 mm	
	No.	Wt. (g)
Carya nutshell	166	2.56
Quercus nutshell	204	.35
Wood charcoal	–	2.19
Zea mays kernels	12	<.01
" " cupules	8	<.01
Insect galls	2	–

Seed identifications:

Amaranthus; 1
Chenopodium; 1
Compositae; 1
Diospyros; 47
Ilex cf. verticilliata; 1
Oxalis; 1
Phalaris; 3
Poaceae unid. type 1; 51
Poaceae unid. type 2; 26
Polygonum; 1
Portulaca; 1
Unidentified; 1
Unidentifiable; 22

Provenience: 164N/107E L.9 FS #: 205
Type of deposit: Moundville III floor
Type of sample: 3 liter flot Processed in: lab
Sample weight (incl. contamination): 12.71 g Weight of plant remains <1.4 mm: 5.34 g

Identification	>1.4 mm	
	No.	Wt. (g)
Carya nutshell	195	2.89
Quercus nutshell	92	.14
Acorn nutmeats	3	<.01
Wood charcoal	–	1.65
Zea mays kernels	26	.02
" " cupules	19	.03
Insect galls	1	–

Seed identifications:

Diospyros; 51
Galium; 1
Ilex cf. verticilliata; 1
Poaceae unid. type 1; 18
Poaceae unid. type 2; 13
Polygonum; 2
Vitis; 1
Unidentified; 2
Unidentifiable; 44

Provenience: Fea. 56, 162N/105E FS #: 283
Type of deposit: Moundville II/III cob-filled pit
Type of sample: 3.5 liter flot. Processed in: lab
Sample weight (incl. contamination): 102.26 g Weight of plant remains <1.4 mm:

Identification	> 1.4 mm	
	No.	Wt. (g)
Carya nutshell	43	.28
Quercus nutshell	28	.03
Wood charcoal	–	10.62
Zea mays kernels	27	.08
" " cupules	approx. 5520	30.54
" " cobs & frags.	66	7.69

Seed identifications:

Fabaceae; 1
Phalaris; 1
Unidentified; 1

Wood identifications:

Pinus; 18
Quercus (red); 2

Provenience: Fea. 22 west half, part A, 168N/92E FS #: 170
Type of deposit: Mississippian cob-filled pit
Type of sample: 13 liter flot. Processed in: lab
Sample weight (incl. contamination): 337.58 g Weight of plant remains <1.4 mm: n.a.

Identification	>1.4 mm	
	No.	Wt. (g)
Carya nutshell	–[1]	–[1]
Quercus nutshell	–[1]	–[1]
Wood charcoal	–[1]	–[1]
Zea mays cupules	(thousands)	189.27
" " cobs & frags.	89	76.40
Cane	–[1]	–[1]

[1] Sample was not completely sorted; these materials were present in the unsorted portion but were not quantified.

Provenience: Fea. 3 west half, 133N/108E FS #: 17
Type of deposit: West Jefferson phase basin-shaped pit
Type of sample: 6 liter flot Processed in: field
Sample weight (incl. contamination): 6.32 g Weight of plant remains <1.4 mm: 1.31 g

Identification	>1.4 mm	
	No.	Wt. (g)
Carya nutshell	46	.14
Quercus nutshell	18	.01
Wood charcoal	–	1.07
Zea mays kernels	3	<.01
Insect galls	1	–

Seed identifications:

Hypoxis; 1
Phalaris; 6
Vitis; 4
Unidentifiable; 9

Provenience: Fea. 2 west half, lower part, 133N/108E FS #: 27
Type of deposit: West Jefferson phase basin-shaped pit
Type of sample: 6 liter flot Processed in: field
Sample weight (incl. contamination): 12.77 g Weight of plant remains <1.4 mm: 8.50 g

Identification	>1.4 mm	
	No.	Wt. (g)
Carya nutshell	131	.61
Quercus nutshell	790	1.67
Acorn nutmeats	14	.14
Wood charcoal	–	5.18
Zea mays kernels	15	.02
" " cupules	3	<.01
Pine cone frags.	–	.54
Insect galls	7	.01

Seed identifications:

Cyperaceae; 1
Sabal cf. minor; 2
Vitis; 1
Unidentifiable; 14

Wood identifications:

Carya; 1
Pinus; 18
Bark; 1

Provenience: Fea. 8 west half, 92N/110E FS #: 40
Type of deposit: West Jefferson phase cylindrical pit
Type of sample: 6 liter flot. Processed in: field
Sample weight (incl. contamination): 19.92 g Weight of plant remains <1.4 mm: 9.05 g

Identification	>1.4 mm	
	No.	Wt. (g)
Carya nutshell	228	1.24
Quercus nutshell	204	.42
Wood charcoal	–	7.03
Zea mays kernels	20	.07
" " cupules	21	.02

Seed identifications:

Amaranthus; 1
Diospyros; 3
Phalaris; 1
Vitis; 2
Unidentifiable; 13

Wood identifications:

Carya; 4
Castanea; 1
Fraxinus; 2
Pinus; 10
Quercus; 2

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