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An Analysis of Lithic Debitage From Mound C at the Winterville Mounds Archaeological Site (22WS500)

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AN ANALYSIS OF LITHIC DEBITAGE FROM *MOUND C* AT THE *WINTERVILLE MOUNDS* ARCHAEOLOGICAL SITE (22WS500)

By

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Abstract

The Winterville Mounds, located in Northwest Mississippi, was once home to one of the largest chiefdoms in the Southeast. It served as a both a religious and political center and housed the ruling class atop its twenty-three manmade mounds. Recent excavation on Mound C at Winterville has uncovered an unusually large quantity of lithic artifacts. In an effort to shed light on the presence of such utilitarian tools where elites resided, this study utilized individual flake analysis on 830 pieces of lithic debitage, including cores, flakes, shatter, and tools. After documenting significant evidence of early through late stage lithic reduction as well as use-wear on many artifacts, I suggest that curated lithic production and domestic activities were taking place atop Mound C.

Keywords: lithic analysis, lithic debitage, Winterville Mounds, Mississippian Period.

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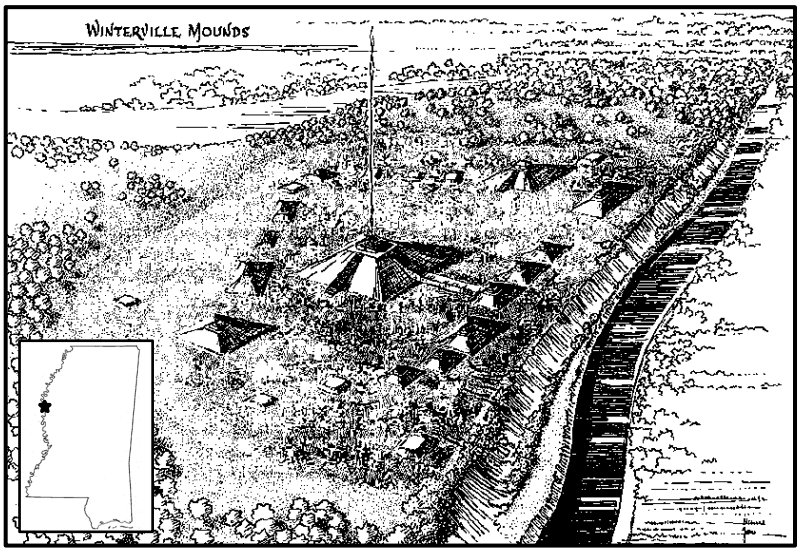
Chapter One: Introduction

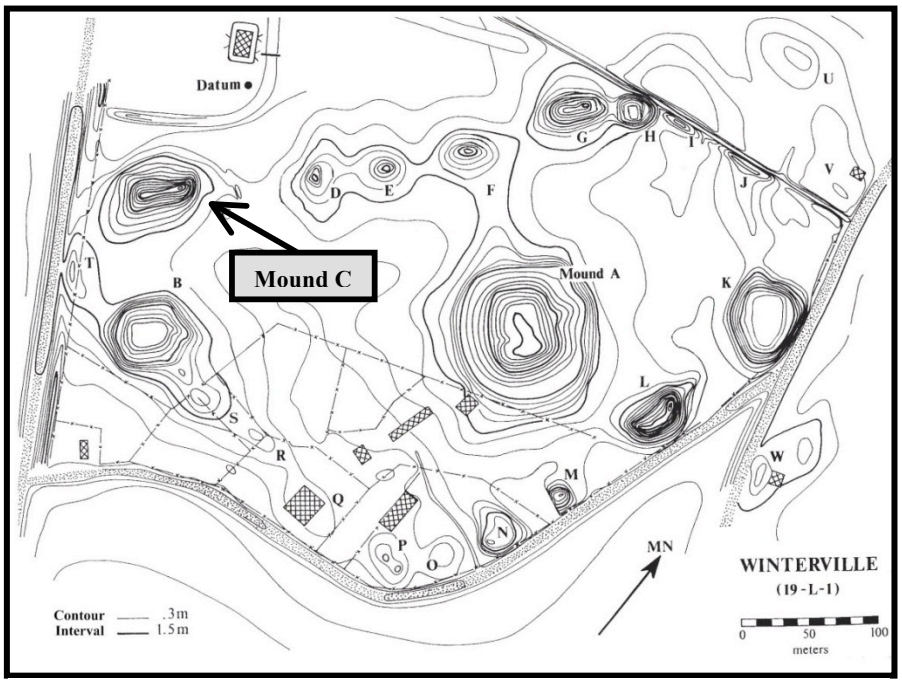
The Winterville Mounds, archaeological site number 22WS500, located near Greenville, MS, is one of the most impressive Native American prehistory sites in the Southeast. Currently owned by the Mississippi Department of Archives and History, the site has been used most recently as the location for the 2005, 2006, 2007, 2009, and 2011 summer archaeology field schools of the University of Southern Mississippi and, therefore, has been the focus of several pieces of student and professor work at this campus. The USM field school director, Dr. H. Edwin Jackson, plans to return to the site in the coming field seasons to conduct further work.



Winterville thrived in what is known as the Mississippian period, approximately 1000-1500 A.D. (Bense 1994: 183). The mounds originally consisted of 23 flat-topped structures arranged around a central plaza, with Mound A—the largest—standing fifty-five feet high in the center of this plaza. Unfortunately, many of the mounds have been damaged due to erosion and human effects on the environment; only approximately eleven of the earthenworks can still be recognized today. These mounds, as was typical for the time period, were used for ceremonial purposes in addition to serving as the residences of select members of the elite. The political structure of Winterville culture has been classified as a chiefdom on the basis of "institutionalized social ranking and the

presence of permanent political offices" (King 2003:4), as evidenced by the residential structures of the highly ranked classes built on the summit of many of the mounds. We know from other chiefdom sites, such as Moundville in Alabama and Cahokia in Illinois, that elites in the Mississippian era had the power to exact tribute goods or services from the lower class, orchestrate feasts, and organize manpower for building structures. However, knowledge about these levels of authority and exactly what privileges members of the elite were allowed is sparse at Winterville. Therefore, this project intends to advance understanding of the authority, privileges, and abilities possessed by elites at Winterville.

The earthwork central to this project is Mound C, a heavily eroded ridge shaped mound which was passed over by the first large-scale excavation of the site—Jeffrey P. Brain's 1960s doctoral research (Brain 1989). However, in the summers of 2009 and



2011, Dr. Jackson and his students and volunteers taking part in the University of Southern Mississippi's archaeology field school undertook the excavation of this mound and, in the course of the field work, unearthed an unusually large amount of

lithic debris. Since this mound, like others throughout the Mississippian period, served as the residence of elites, we would not expect to find such a large assemblage of utilitarian tool-making debitage. Presumably, elites would have had the resources to contract out such labor if the product of the labor was necessary to them (and there is even question that they would have needed domestic tools in the first place). Therefore, the mystery this large collection of lithic debris presents is a second area at Winterville which requires research. In order to shed some light on both of these areas—the elite life patterns at Winterville and the extensive collection of lithic materials—I performed analysis on the stone artifacts from Mound C, including flakes, cores, broken, and finished products uncovered there. My analysis included individual flake analysis and comparative study in order to answer the question, "What can the nature of the lithic debris on Mound C at the Winterville Mounds site reveal about the lifestyle of the elites living there?"

Chapter Two: Review of Literature

Mississippian Social Structure and Elites

According to Judith A. Bense, who has published a definitive work on Southeastern archaeology, the main type of social organization during the period of Mississippian cultural tradition was the chiefdom. This particular model of society consisted of the ruling elite and the commoners which were subjected to this rule. Status was attributed by virtue of birth and often legitimized through religious ideology (King 2003: 4). The overall "chief" of the community resided atop the largest and often most central mound—Mound A at Winterville, for example—and the leaders of lesser ranked clans would inhabit the smaller mounds (Kidder 1998: 143). In general, elite members of society had special access to goods and authority denied to commoners (Bense 1994; Jackson and Scott 2010; Kidder 1998; King 2003). The elite were permitted to live on top of the mounds and were also the contractors for these structures; in other words, they possessed the power to organize and direct the labor of commoners and their kinspeople to quite an extensive degree in order to build such monuments—the largest of almost two dozen mounds at Winterville stands an impressive fifty-five feet tall.

The works of many archaeologists refer to the religion which thrived throughout Mississippian chiefdoms as the Southern Cult or the Southern Ceremonial Complex; this spiritual system emphasized ancestor worship, warfare, and fertility (Bense 1994; Knight 1986). The mounds were an important factor in this religion. In addition to serving as elite residences, select mounds often served as temples and places of worship. Knight suggests that mounds are the physical representation of the communal cult and that they represent the earth in Native American philosophy (1986:678). Elites

reigned over this belief system—they legitimized their rule through appealing to a kind of divine right and served as intermediaries between the supernatural and man. According to Jackson and Scott, "the chief's close link with the supernatural enables and justifies his/her role as decision maker" (2010: 326). Based on this religious and political power, elites could demand tribute in the form of goods and food. Specifically, Jackson and Scott argue that the considerable quantities of choice cuts from large mammals which excavators uncovered at the Moundville site indicate that elites had the power to demand these tribute meats from the commoners who obtained them.

The religious aspect of mound life would seem to be of particular importance at Winterville. Jeffrey P. Brain's work at this site identified a "general lack of subsistence tools," "low population density," and "choice cuts of meat" being brought in (1989: 110). He used this evidence to suggest that the site was not typical Mississippian in which we might see a high population density and therefore more indications of daily life. Winterville seemed to be a site which was primarily used as the religious center of the chiefdom rather than serving mainly as the center of habitation in the region (Brain 1989: 110). However, since Brain's study, recent excavations at this site have uncovered off mound residential structures, in particular Area A, which might account for at least a portion of the seemingly missing commoner population (Jackson 2007).

Thus far, Mississippian elites have been characterized as wielding power and authority enough to command their subjects and employing this power often. Some scholars view this characterization as overly materialistic and propose alternatives. Mesoamerican anthropologist Richard Blanton of Purdue University suggests that a

chiefdom may operate on an exclusionary strategy or on a corporate strategy. In the exclusionary strategy, chiefs build a "political system [based] around their monopoly control of sources of power," while those utilizing a corporate strategy are more community-oriented (Blanton et al. 1996: 2). King applies this dichotomy to Mississippian political strategies: in an exclusionary strategy,

> there will be marked differences in wealth and prestige between elites and non-elites… leaders also will be closely associated with nonlocal materials, symbols, or architectural styles, indicating the importance of external contacts to the maintenance of political authority. … [while] polities based in a corporate strategy are likely to exhibit fewer differences in wealth and status, as reflected in mortuary programs, material possessions, and architectural arrangements. … Important people or social segments are more likely to be associated … with the manipulation of agricultural produce and crafts, rather than exotica and prestige goods [King 2003:18].

Both Blanton and his colleagues and King assert that there is room for abundant variation within this dichotomy, but they maintain that one of these strategies is usually dominant in a political structure (Blanton et al. 1996: 5-6; King 2003: 18). Were an exclusionary strategy system being employed at Winterville, we would expect to find lithics of rarer materials, perhaps prestige items, on mounds and utilitarian lithics away from elite residences. However, since elites are more often associated with local crafting in corporate strategies of rule, the ample lithic materials of local nature on Mound C might be evidence of dominance of the corporate strategy.

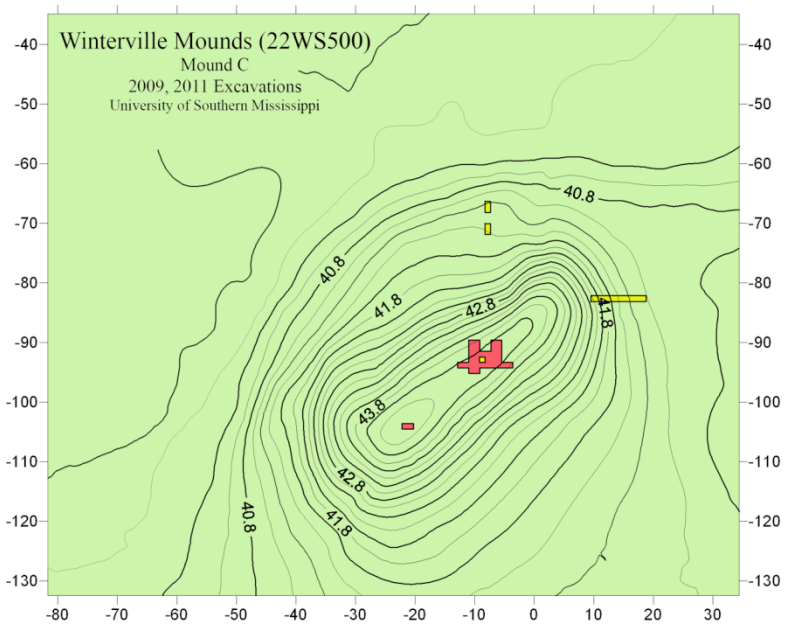
Winterville Background and Excavation

The Winterville Mounds site served as the political and ceremonial center of a late prehistoric chiefdom which thrived in the Mississippi Delta. As evidenced by potsherds found on the southeastern side of the site, this settlement was first permanently occupied during the Crippen Point phase, which is found throughout the lower Yazoo Basin region (Brain 1989: 93). The mounds of Winterville, of which there were originally 23, began to be constructed approximately AD 1200 in the Winterville phase (1200-1350 CE) of the Mississippian Period (Jackson and Kowalski 2010: 1). At this time the Plaquemine culture—which is characterized by Brain as the result of Mississippian culture contacting the Coles Creek culture and producing a system showing influences from both cultures—was affecting Winterville as well (Brain 1989: 110). Tristram R. Kidder, on the other hand, rejects Brain's view; he does not believe that contact from Mississippian culture was necessary for the Plaquemine to develop, it was simply the "logical outgrowth of Coles Creek cultural evolution" (Kidder 1998:131). But regardless of how they evolved, these three culture systems consecutively existed at Winterville and are represented in the artifact assemblage.

Period	Dominant Culture System	Phase in the Yazoo Basin	Date
Mississippian	*Coles Creek*	Crippen Point	1000-1200 CE
	Plaquemine	Winterville	1200-1350 CE
	Mississippian	Lake George	1350-1500 CE
		Wasp Lake Phase	1500-1700 CE

Table 1: Chronological procession of the cultures and phases of the Mississippian Period.

Winterville continued to be occupied into the Lake George phase of the Mississippian period and thrived until it was abandoned after 1500 AD (Jackson and Kowalski 2010: 1). The mounds form a shape that is unusual for the typical Mississippian chiefdom. Generally mounds are constructed in a rough circle or rectangle enclosing a central plaza from which all the mounds are accessed. However, at Winterville, the mounds were arranged in an oval, but Mound A, the largest and most prominent, was placed in the middle consequently cutting the area in half and forming two plazas.



Mound C, the location focused on in this study, is on the southwest corner of the site and helps form part of the southern plaza. This mound has received little attention from archaeologists throughout the modern age. Clarence B. Moore, who was the first archaeologist to professionally excavate the site, did place some test holes in the mound when he conducted research there in late 1907 (Jackson and Kowalski 2010: 1). However, Moore was disappointed in the lack of artifacts, specifically whole ceramic vessels, from Winterville, and his opinion of the site must have given it somewhat of a bad reputation, because there were no further excavations until Jeffrey P. Brain's research

in the late 1960s. In 1989, Brain published an Archaeological Report on Winterville which stemmed from his Yale dissertation work. Although Brain's study gives us a comprehensive view on the changes in the artifact assembly and, therefore, culture of Winterville over time, he did not excavate Mound C. The artifacts he did catalogue from other mounds at the site presented an unusual pattern. The non-pottery material represents less than one percent of the total artifact collection (only 200 artifacts). Brain describes the amount of tools found at Winterville "surprisingly low for a site of this magnitude" (1989: 89). He interpreted this to mean that Winterville served essentially as a ceremonial center instead of living area for anyone besides the elites. However, at Mound C, we seem to have found some of the missing tools, as discussed below.

The only work done on this mound (besides Moore's test holes) was conducted in 2009 and 2011 during field schools directed by H. Edwin Jackson, professor of anthropology at the University of Southern Mississippi. The 2009 field season performed excavations on the northern and eastern flanks of the mound and on the summit. The units dug revealed a great amount of slopewash (85-100 cm in the north units and 40 cm in the east trench) which explains how the formerly rectangular mound developed its current elliptical shape. Jackson and Kowalski, in their 2010 report, describe the excavation at the summit of the mound, saying that it "produced a very large number of cobble cores and debitage, significantly more than we have found in other contexts" (17). Their initial assessment is that some form of crafting took place on Mound C. This impression of high lithic density seems to be reinforced by the 2011

extensive excavation into the summit of the mound. These units produced a large quantity of lithic material, consistent with that produced in 2009.

Lithic Analysis

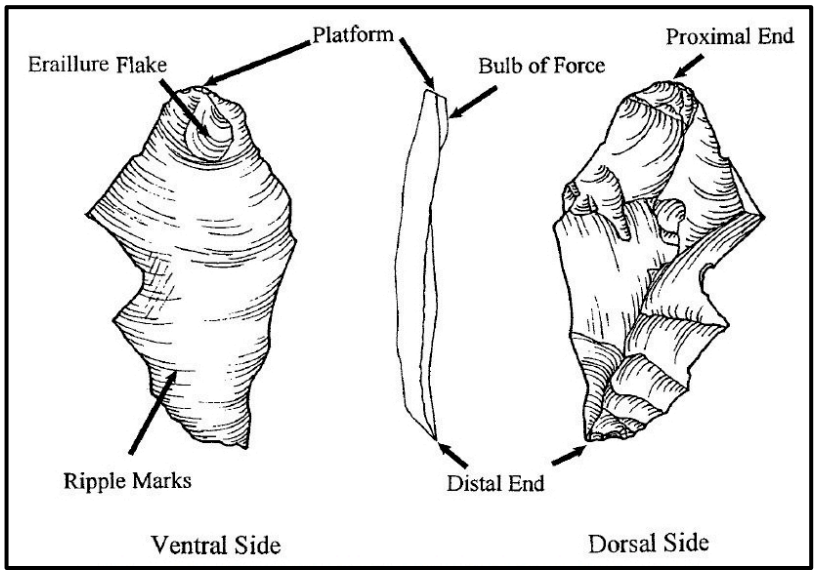
Lithic analysis has been successfully used to understand cultural systems throughout the globe (Andrefsky 2005; Johnson 1996; Markin 1997; Yohe 2006; etc.). The debris and products that result from stone tool production can provide a plethora of information concerning lithic tool production.

By analyzing stone tools themselves we can gather information about how that tool was used by looking at its morphology and patterns of use wear—for example, tools that regularly come in contact with wood, bone, or animal hide have distinct markings that can be differentiated on a microscopic level. Similarly to ceramic vessel shape and decoration (but perhaps not as precise), stone tools were made in certain ways at certain times and, therefore, can give us information about what culture was dominant where certain tools are found. For instance, Grant side notched projectile points denote middle Mississippian sites in the Upper Mississippi Valley (Boszhardt n.d.).

The debris from making stone tools, which is the primary focus of this study, can also tell us much about the circumstances surrounding prehistoric flintknapping. Debitage is especially useful for predicting what type of tool manufacture was being practiced. An assemblage comprised of large corticle flakes (those with a dorsal aspect completely covered with cortex, or weathered original stone surface) and broken early-stage tool forms would be suggestive of a site used for initial raw material reduction,

perhaps at a quarry. The number of dorsal scars and platform facets of a piece of debris can also give information about how much work the flintknapper was expending on the tool being produced immediately before the flake was removed.

Here it is necessary to describe the basic anatomy of flakes, as well as contrast them with other types of debitage, for the uninitiated reader. Flakes are defined as the portion of stone detached from a core or tool by means of percussion (striking with a hard or soft hammer) or pressure flaking (done by pushing rather than striking). These



applications of force will result in energy transfer in the form of a cone—known as the Hertzian cone, after the German physicist Heinrich Rudolf Hertz who first described the phenomenon. The flake that results from pressure or a percussion strike is part of this cone. Complete flakes usually possess a bulb of percussion (sometimes called bulb of force) on the ventral surface, a striking platform at the proximal end, and a termination at the distal end. Many flakes also have ripple marks on the ventral aspect which occur concave to the striking platform. On the dorsal aspect, a flake will either have dorsal scars, which are the marks of previous flake removals, or be partially or completely covered in cortex (the weathered surface of the stone it was struck from). Besides flakes, flintknapping can also unintentionally

result in angular debris, called shatter or blocky fragments. The stone from which flakes and shatter are struck is called a core or cobble. All of these artifacts—cores, flakes, and shatter—are studied in the archaeological analysis of lithics.

The traditional approach to lithic analysis, often called the PST method, consisted of classifying each flake as primary, secondary, or tertiary based on its amount of cortex (weathered original stone surface). Primary flakes are those removed during the first stage of reduction and have a significant amount of cortex present; secondary flakes are removed later than primary and have less dorsal cortex; and tertiary flakes are those generated during tool production which lack cortex (Bradbury and Carr 1995). Each of these flake types was thought to represent a stage in tool manufacture.

However, recent experimentation in the field of flintknapping (the process of making stone tools) has led to the conclusion that the traditional staged approach is not reliable (Bradbury 1998; Bradbury and Carr 1995). There are several assumptions that the PST method maintains about lithic assemblages which may not be the case. For instance, traditional analysis does not take into account different types of tool technologies. The most well-known technology is biface tool production which often results in projectile points—this is the manufacture method that PST presumes for all flakes. However, there are also manufacture methods that seek to only produce flakes to then use as tools. A second assumption of PST analysis is that flakes are produced from medium to large nodules; this assumption becomes erroneous when prehistoric flintknappers utilized small cores, such as those found in river beds like the Mississippi. Other criticisms of PST state that cortex recording is inconsistent, the categories are unstandardized, and the methodology can only be applied to complete flakes (Bradbury

and Carr 1995: 101). As a result of experimental studies, the erroneous assumptions of the "traditional" approach have been more clearly understood and the approach of focusing on just one attribute of retained cortex has become outdated (Bradbury and Carr 1995: 106); individual flake examination, multiple attribute recording, and mass analysis have largely filled the PST method's spot as the most dependable means of studying lithic debitage (H. Edwin Jackson, personal communication 2011).

Andrew P. Bradbury and Philip J. Carr's 1995 experimental study tested several types of lithic analysis and found that platform facet count, discussed in detail in chapter three, was the best single attribute for identifying the sequence of the production process that produced the flakes. However, this method only achieved 70% correct classification of flakes in their study (Bradbury and Carr 1995: 108). Therefore, Bradbury and Carr advocate using several attributes together to characterize flakes: platform facets, dorsal scars, weight, cortex, and platform configuration. This method, they suggest, will yield the most significant and reliable data about lithic assemblages.

Studies, such as Julie Markin's 1997 research at Moundville in Alabama, show that other chiefdoms comparable to Winterville display lithic assemblages on mounds. Some researchers suggest that these assemblages indicate craft "workshops" possibly orchestrated or even undertaken by elites (Johnson 1996; King 2003; Markin 1997). However, this conclusion is often made by looking at the non-local raw materials present in the lithic assemblages. At Winterville, the vast lithic assemblage from Mound C is mostly composed of local raw-material.

Jay Johnson of the University of Mississippi has identified several characteristics which could indicate craft specialization at ancient sites even in the absence of exotic

stone. Johnson argues that sites of pre-historic craft workshops will have large piles of debitage and few, if any, completed tools. Another indication of workshop production is when the quantity of tools produced—estimated based on the amount of lithic debitage—is deemed to be more than what the local population can use (Johnson 1996). The preceding studies can be applied to the lithic assemblage found at the Winterville Mounds site in order to derive information pertaining to the large amount of chert debris found there.

While the lithic material from Mound C has been relatively untouched by researchers, Jennifer Winter, a graduate student under Dr. Ed Jackson did perform lithic analysis on material from other locations at Winterville. Of particular interest is her work at Area A. This section of the site has been identified as a residential area, perhaps serving the non-elite population. Based on the large amount of shatter (non-flake debitage), cores and cobbles, Winter found that the lithic production here consisted largely of early-stage reduction—typical of the production of flakes for tools—and that 99.7% of the material used for manufacturing was local Citronelle gravel (2009: 1, 15). This "commoner" debitage will prove interesting and useful as a comparison with the lithics associated with Mound C.

Chapter Three: Methodology

During the 2009 summer field school held by The University of Southern Mississippi and directed by Dr. H. E. Jackson, professor of anthropology at USM, supervised students excavated at Mound C of the Winterville Mounds site in Greenville, MS. These participants put a 1m x 1m unit in at the summit of the mound, a trench on the east flank, and two units on the north flank (Jackson and Kowalski 2010: 6). Among the artifacts they uncovered was an unusually large collection of lithic debris, including cores and debitage (Jackson and Kowalski 2010: 17). At the conclusion of the field school session, these artifacts were taken back to the archaeology laboratory at USM where they were cleaned and catalogued; this laboratory is also where I carried out their analysis.

Dr. Jackson returned to the Winterville Mounds in the summer of 2011 to continue excavation as part of USM's annual field school. In those six-weeks, his team again focused on Mound C, putting several units into the summit of the structure. Akin to the 2009 excavations, the 2011 field season produced a large quantity of lithic artifacts from Mound C. Through study of the stratigraphic and ceramic evidence following the completion of these field schools, Dr. Jackson was able to decide which materials excavated came from actual midden and which were deposited on the Mound with the fill used to construct it. The lithics in the former group are used for this study; they are comprised of 830 artifacts including cores, flakes, shatter, and bifaces. These lithics composed the total sample for my study.

As noted in the review of the literature, the methods of stone tool analysis have been fairly well established. Although in the past a single attribute was used for classification (e.g. dorsal cortex), through experimentation, archaeologists have observed

that recording multiple attributes of flakes provides the most extensive and useful results for interpretation (Bradbury 1998; Bradbury and Carr 1995). As a guide to attribute selection, based on the recommendation from my thesis advisor Dr. H. E. Jackson, I primarily adopted the methods utilized by Andrew P. Bradbury and Philip J. Carr, which they described in their 1995 experimental research (Bradbury and Carr 1995: 106). In this project, I scored the size, weight, raw material, heat treatment, portion, number of platform facets, platform configuration, dorsal cortex, dorsal scars, presence of modification, and type of reduction of each artifact using the codes below in Figure 5.

Platform facet count, the most useful single attribute for identification, is measured by counting the number of faces on the striking platform of a lithic flake. In general, the higher the number of facets, the later in the production process the flake was chipped off its core (Bradbury and Carr 1995:108). This is because faceting on the striking platform results from platform preparation—in other words, flakes are being taken off the platform to ready it for an ideal blow that will result in a predictable flake removal. The more flakes taken off the platform, the more care was taken with the knapping process—such care is indicative of later stage production.

Dorsal scar count allows archaeologists to estimate how many flakes were knocked off the core prior to the flake being analyzed. Cortex is the natural weathered exterior of a stone and was measured using a percentage. Bradbury and Carr used four categories to describe platform configuration: "crushed, lipped, cortical, and non-lipped/non-cortical" and I used similar categories (1995: 115).

Heat treatment—which according to Robert M. Yohe, II, can be identified by noting a flake's "waxy or glossy appearance," color changes, pot lidding, and crazing (2006: 43)—was also among the modifications I recorded for each artifact. Intentional heat treatment, often done by building a fire on top of the buried raw materials and letting the rock bake, is used by many flintknappers to improve the flaking quality of stone.

INDIVIDUAL LITHIC ANALYSIS:
Winterville Mound C (22WS500)
DATA SCORING CODES

SG = Size Grade
(Will fit within __ Diameter Circle)
1 = ¼"
2 = ½"
3 = 1"
4 = 2"
5 = >2"

WT = Weight in grams

RM = Raw Material
0 = Unknown/other
1 = Local Chert Gravel
2 = Mounds Gravel
3 = Tallahatta Quartzite
4 = Quartzite Gravel
5 = Sandstone
6 = Agate
7 = Petrified Wood
8 = White Chert
9 = Dover Chert
10 = Fort Payne Chert
11 = Novaculite
12 = Burlington
13 = Dover KY
14 = Coastal Plain Chert
15 = Siltstone
16 = Mill Creek
17 = Kincaid Chert
18 = Brush Creek Chert
19 = Camden Chert

HT = Heat Treatment
0 = None obvious
1 = possible
2 = obvious

PO = Portion
1 = Complete Flake
2 = Proximal
3 = Medial
4 = Distal
5 = Blocky Fragment/ Shatter
6 = Split Longitudinally
7 = Fire Shatter
8 = Potlid
99 = other: go to LC

PF = Platform Facets
# = #
4 = 4 or more facets
100 = missing platform
101 = crushed platform

PL = Platform
1 = no cortex; non-lipped
2 = no cortex; lipped
3 = cortex; non-lipped
4 = cortex; lipped
100 = missing platform
101 = crushed platform

CO = Dorsal Cortex
0 = 0%
1 = 1-25%
2 = 26-50%
3 = 51-75%
4 = 76-99%
5 = 100%

DS = Dorsal Scars
(*facets* from removed flakes)
0 = cortex
# = #
99 = indiscernible

MO = Modification
0 = none obvious
1 = one edge retouched
2 = 2+ edges retouched
3 = possible utilization
4 = obvious utilization

RD = Reduction
1 = Bipolar
2 = Bifacial Thinning
3 = notching
4 = standard/other

LC = Lithic Category
1 = Unmodified Nodule
2 = Tested Nodule
3 = Core
4 = Complete Biface
5 = Biface Fragment
6 = Indeterminate Tool Fragment
7 = Drill Fragment
8 = Drill
9 = Groundstone artifact
10 = Firecracked Rock
11 = Polishing Stone
12 = Formal Scraper
13 = Hammerstone
14 = Split Cobble
15 = Pebble
16 = Abraider

Finally, I recorded the raw material for each flake, based on macroscopic comparison with examples from known sources, in order to derive information about how

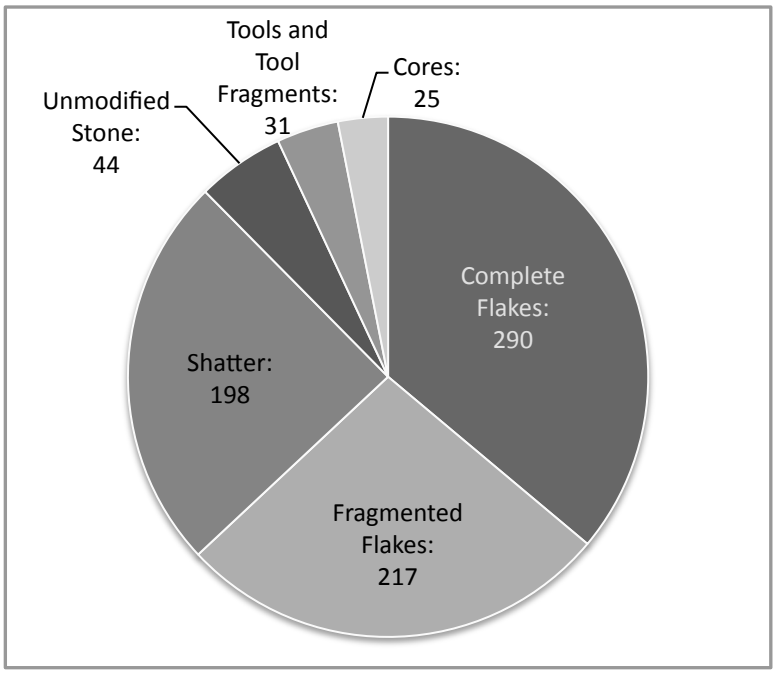
far the inhabitants of Winterville travelled or traded to obtain their stone. The lithic comparative collection at USM's archaeology lab was my resource for sourcing each lithic type.

Bradbury and Carr also found mass analysis to be useful, especially in conjunction with individual flake attribute recording (Bradbury and Carr 1995: 111). Unfortunately, mass analysis is best applied to samples resulting from one flaking episode. The assemblage at Winterville Mound C is the accumulation of debris from numerous flaking episodes occurring over many decades and, as such, mass analysis was not used during my project, but size and weight were interpreted in conjunction with other variables.

As a contrast to data on the lithic activity of Mound C, I compared my results with Jennifer R. Winter's study on the lithic material found at a residential area at the Winterville Mounds site to draw some conclusions on the difference between the activities being performed at commoner residences and those executed on mounds. Using these methodologies I will describe below the nature of the lithic production on Mound C and provide insight pertaining to the activities of the elites which inhabited it.

Chapter Four: Results

The 830 lithic artifacts from Winterville's Mound C were each scored on eleven characteristics which will be discussed both individually and in terms of their relation to other observations in the following chapters.



Thirty-five percent of the artifacts were complete flakes (i.e. exhibiting both a platform and termination); twenty-six percent were fragmented flakes, either proximal, medial, distal, or longitudinally broken; twenty-four percent of the artifacts were shatter or blocky fragments. There were also twenty-five cores, thirty-one tools and tool fragments, and forty-four unmodified stones in the assemblage.

Of the total assemblage, 755 artifacts could be confidently sourced by raw material using the comparative collection at the USM archaeology laboratory; although, macroscopic identification has its limitations and the only absolute method of lithic sourcing is through trace element analysis (Bradbury and Carr 2000: 121)—a method beyond the resources of this project. The vast majority of the debitage identified by macroscopic comparison, 91.5%, was local chert gravel. Twenty-eight artifacts were identified as Fort Payne chert, twenty-one were identified as Burlington, nine as Dover, two as Coastal Plain chert, and one each of Mill Creek, Kincaid, Brush Creek, and

Camden chert. Fort Payne is a widely dispersed flint with outcrops from Kentucky through Alabama, while Dover is most commonly found in Tennessee. Burlington, Mill Creek, Kincaid, and Camden are all varieties of stone found in Illinois. Interestingly, the average weight of the local gravel was 5.16g, and the average weight of the specimens identified as non-local was 1.43g.

Of the 358 flakes with intact platforms, 41.6% exhibited lipping and 44.4% exhibited cortex. Of the 341 specimens for which platform facets could be recorded, 70.9% had one facet; 20.1% had two facets; 5.8% had 3 facets; and 2.6% had greater than 4 facets.

The results of cortex percentage scoring and dorsal scar count are reported in Tables 2 and 3 below for all complete flakes, as incomplete flakes do not exhibit the entire dorsal aspect and, therefore, would erroneously distort the data.

Table 2: Flakes exhibiting Dorsal Cortex by percentage

No Cortex	59 (20.3%)
1-25%	123 (42.3%)
26-50%	41 (14.1%)
51-74%	25 (8.6%)
75-99%	22 (7.6%)
100% Cortex	20 (6.9%)

Table 3: Flakes by Dorsal Scar Count

100% Cortex	20 (6.7%)
1 scar	39 (13.4%)
2 scars	51 (17.5%)
3 scars	72 (24.7%)
4 scars	45 (15.5%)
5 or more	63 (21.6%)

Modification was confidently scored on 765 artifacts in the assemblage. 603 of these had no obvious modification; thirty-six had one edge retouched; twenty-seven had two edges retouched; and 99 had been obviously utilized. While non-modified artifacts had an average weight of 4.34g, the mean weight of those artifacts which had been

obviously utilized was 9.97g; of all retouched artifacts, average weight was 4.35; and the average weight of all modified artifacts was 8.63. This means that modified artifacts were, on average, twice the weight of non-modified lithics. A raw material modification, heat treatment—evaluated by crazing, color, and glossy surface—was obvious on 458 pieces, possible on 172, and lacking on 155 specimens in the assemblage.

Chapter Five: Discussion

The results of this study have several implications concerning the nature of lithic debitage on Mound C at the Winterville Mounds archaeological site. One of the first subjects lithic analysis attempts to shed light on is method of production. It is clear that several means were used to produce debris at Winterville. Platform lipping, according to Bradbury and Carr, "occurs almost exclusively on flakes produced by soft hammer percussion, [although] many soft hammer flakes do not exhibit lipped platforms" (1995: 105). Therefore, since 149 flakes of the 358 flakes with intact platforms exhibited a lipped platform, *at least* 41.6% of the assemblage was produced by soft hammer percussion. As this type of flintknapping occurs in the latter stages of curated tool production, I suggest that a large percentage of the assemblage resulted from biface production, as opposed to early-stage reduction. This suggestion is further supported by the fact that the assemblage consisted of a majority of flakes and flake fragments—508 or 61.2%. However, there were also twenty-five stones used as cores, which means early stage reduction was carried out on the summit of the mound as well. Bipolar reduction, (in which a core is placed on an anvil and struck randomly with a hammerstone to produce flakes which are distinguishable by their two bulbs of percussion) was used in many later Mississippian sites, but seems to have been rejected at Winterville. Only one flake exhibited clear bipolarity, indicating that this method could not have been common. However, since it is struck randomly, the core is "unlikely to yield the desired result" (Bradbury and Carr 2009: 2790) and so, some of the shatter found at Winterville may have resulted from bipolar reduction.

Of the 290 complete flakes, 182, or nearly two-thirds, had 25% or less dorsal cortex. The majority of flakes had greater than three dorsal scars as well—both of which

indicate curated tool production rather than expedient flake-tool production. However, that is not to say flake-tools were never the end goal for Mound C flintknappers. Many of the flakes, and even pieces classified as shatter or blocky fragments, displayed obvious utilization (12.9%), and a smaller portion of those that could be scored on modification had been purposefully retouched (8.2%). As it seems unpractical to assume the tools would have been transported back up the mound after being used elsewhere, we must assume that everyday domestic processes were being completed in the same location as elite residences. In addition to actual flintknapping it seems that the raw materials were prepared atop Mound C as well. Heat treatment prior to reduction, which was positively noted for 55.2% and probable for another 20.7% of the sample, is evidence of this preparation, as are the many pieces of fire shatter within the assemblage. However, the ritual burning of structures atop Mound C probably accounts for a portion of the debris being burned—though intentionally heat treatment was also clearly taking place.

The raw materials used at Winterville's Mound C were mainly locally attained gravel (91.5%). The close proximity of the Mississippi River can at least partially explain this tendency as the riverbed would have provided ample gravel to use for flintknapping, eliminating the necessity of earnest trade of this material—although some was definitely transported long distances to Winterville. Raw material can also be compared with artifact weight for interesting interpretations. For example, non-local lithics have a mean weight of 1.43g while local lithics average at 5.16g. Since artifact weight is correlated with stage of production (Teltser 1991: 369), we can infer that the flintknappers of Mound C were using the non-local—and, therefore, more valuable—materials more conservatively in lithic reduction; large flakes of these rarer materials

were not discarded as often as local gravel flakes. Another interpretation of the smaller flakes being more likely to be exotic materials is that preforms (artifacts preliminarily shaped at the quarry site to reduce the weight of transport) or finished products could have been the main focus of trade. This would result in tools of exotic materials only needing to be reshaped or sharpened during their uselife at Winterville.

Jennifer Winter's analysis of lithic materials from Area A provides an interesting contrast for this study. While Winter's sample from the "commoner" residential Area A at Winterville consisted largely of shatter and cores and was highly indicative of the production of flakes for tools, the mound assemblage was composed mostly of flakes and flake fragments, many of which were utilized. The sample indicates that Mound C lithic production was more varied than that of residential areas at Winterville. Flintknappers on the mound were aiming toward flakes as tools as well as biface reduction. The mound lithics were also slightly more varied in their raw materials; Winter's lithics were 99.7% local gravel whereas 91.5% of Mound C's identifiable lithics were local gravel. This seems to indicate that the elites, or those crafting on Mound C, were carrying flintknapping to a later stage of production than the commoners, but that they either did not have access to, or did not need, significantly better lithic raw materials than those accessible to the masses.

Further inferences can be drawn from the overall assemblage as well. The large quantity of debitage and the near absence of any completed tools (only three projectile points were recovered) seem to suggest institutionalized crafting was taking place on the mound.

Through this analysis, a picture of lithic production on Mound C and Winterville as a whole is materializing. Flintknapping was clearly an active occupation atop the mound with curated lithic production predominantly taking place. These crafters seemed to have slightly more access to non-local goods than commoners, but for the most part, they utilized the convenient gravel they could easily procure in abundance. Flakes and shatter also show use-wear indicating that other domestic processes were being carried out in addition to flintknapping.

As a whole, the nature of lithic production on Mound C is very different from what we would expect to find the privileged elite engaging in. It is possible, of course, that the elite contracted out these daily tasks to their subjects, and the mound simply served as a convenient location for these activities. Conversely, a more corporate political system could be utilized by Winterville's elite. This may be substantiated by on-mound crafting and the lack of non-local raw materials. However, Winterville does show clear differentiation between the living activities and mortuary practices between elites and non-elites which is indicative of exclusionary elite power strategy. It seems Winterville's rulers were not so disengaged from domestic life as we imagine the highest class to be, and might have been utilizing a mixed exclusionary/corporate strategy of rule.

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