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Beads, Bifaces, and Blade Cores from the Middle Archaic

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Introduction

The Middle Archaic (6000-4000 BC) was long regarded within the archaeological community of the Southeast U.S. as a transitional time period without extraordinary characteristics. Considered as an extension of lifeways from the Early Archaic into the Late Archaic, Smith (1986:21) described it as a time period without any "technological innovations of a revolutionary nature." Caldwell (1958) coined the term "Primary Forest Efficiency" to describe subsistence patterns for the Late Archaic which promotes thinking of the Middle Archaic as transitional in a general progression of increasing exploitation of the natural environment. Referred to by geologists as the Mid-Holocene or Altithermal, the Middle Archaic is becoming recognized as an environmentally and archaeologically distinctive time (Bense 1994). In particular, archaeologists are beginning to investigate the rise of cultural complexity in the Middle and Late Archaic (Gibson and Carr n.d.).

Despite the amount of research accomplished at Middle Archaic sites in the Southeast, little is known about the lifeways of that era. Cultures of the Middle Archaic were based on hunting and gathering; lifeways are commonly reconstructed as small bands of multiple families moving between short term settlements in a single river valley (Bense 1994). Middle Archaic technology and settlement patterns have often been described as relatively simple (Smith 1986). However, thick middens such as those along the Tombigbee River, large earthen mounds such as Watson Brake, and sites with non-utilitarian stone artifacts such as the John Forrest site, are forcing archaeologists to reconsider previous conceptions of Middle Archaic lifeways. Do the inhabitants of the John Forrest site fit the traditional description of a simple pre-agricultural group that

lived in "small, ephemeral encampments occupied by a few people eating, sleeping, scraping hides, and only occasionally reproducing" (Price and Brown 1985:3)? It is now necessary to develop fresh interpretations of Middle Archaic lifeways based on new evidence.

In recent years, cultural complexity has developed as an important topic of investigation for archaeologists studying prehistoric hunter-gatherers. Archaeology is the only means available to investigate the rise of cultural complexity and increasing evidence demonstrates that prehistoric hunter-gatherers were far from simple. Price and Brown (1985) effectively argue that contemporary hunter-gatherers do not represent the range of variability in hunter-gatherer societies of the past. Also important to the study of cultural complexity is the realization that the term "complexity" can mean many things. However, the term is best applied to the archaeological record as meaning an "increase in size, scale, and organization" of cultures (Price and Brown:8). More recently other researchers have reached a similar conclusion or built on this conception (e.g. Arnold 1996, Feinman 1995, Hayden 1995). In the case of the John Forrest Site, cultural complexity will be addressed in terms of craft specialization.

The John Forrest Site is located in Claiborne County, Mississippi, just east of the Mississippi River. The site is situated on a large, flat ridge above James Creek. Today, the John Forrest Site appears to be nothing more than a large field, with woods bordering its extreme edges and slopes. However, years of surface collection by the landowner, John Forrest, has produced a large collection of artifacts. This surface assemblage contains a wide variety of stone tools and production debris, as well as some relatively rare types of stone artifacts. Blade cores, microdrills, and stone beads are absent at most

Middle and Late Archaic sites, but contained in the John Forrest assemblage. The focus of this thesis is a thorough description and analysis of the surface collection from the John Forrest Site. The significance of this assemblage is that it provides evidence with which to investigate aspects of culture not usually associated with the Middle Archaic, namely craft specialization and how it may be related to the rise of cultural complexity. A comparison with other Middle Archaic sites in the region allows the John Forrest assemblage to be placed in a broader context. I conclude by discussing the implications of the John Forrest site for reconstructing Middle Archaic lifeways.

Middle Archaic

Environment

Environmental change during the Middle Archaic resulted from post-glacial warming that occurred in the Southeast and across the world. This geologic period, the Mid-Holocene, is marked by stabilization of the environment (Schuldenren 1993). Major shifts in vegetation and hydrology occurred as the climate became warmer and drier across the Southeast. In many areas hardwoods died and savannah spread east from the Mississippi River (Bense 1994). The John Forrest Site is located in a narrow corridor along the Mississippi River that remained sufficiently wet to support a mixture of hardwoods during the entire Holocene (Smith 1986:4-5). Mid-Holocene climatic changes affected river systems across the Southeast. Most river currents slowed and stabilized, creating large swamps and oxbow lakes as persistent environments attractive for semi-permanent human settlement (Smith 1986:25). These new environments supported large populations of freshwater mollusks, a resource increasingly exploited during the Middle Archaic as evidenced by the many shell middens found throughout the

mid-Southeast, such as those along the Tombigbee and Tennessee Rivers (Smith 1986:24).

Cultural Background

Interpretations of mortuary practices have generally shaped archaeologists' views of the past. However, the few excavated burials that can be assigned confidently to the Middle Archaic come from only three sites (Smith 1986:26). This limited sample of skeletal remains dating to the Middle Archaic reveals that malnutrition was not an issue, nor were any major chronic diseases that leave traces on bones (Bense 1994:80). Common health problems people deal with today, such as arthritis, anemia, broken bones, and kidney stones, were also problems during the Middle Archaic (Bense 1994:80-81).

Stone artifacts are the most common remnants left by the people of the Middle Archaic and these can be studied to shed light on their lifeways, particularly through the use of an organization of technology approach (Nelson 1991). Common hafted biface types such as Morrow Mountain, Sykes-White Springs, and Eva are diagnostic for the time period. These hafted bifaces often exhibit multiple uses, such as points converted to drills or end scrapers, which were then exhausted before being discarded (Bense1994). Heat treatment was commonly used to make raw material easier to knap into tools. Other artifact types frequently recovered from Middle Archaic sites include ground and pecked stone tools, and bone and shell with various uses (Bense 1994; Smith 1986). Some researchers consider the increased number of heavy groundstone artifacts on sites as an indicator of decreased residential mobility, although this is still debated (Smith1986).

Settlement patterns during the Middle Archaic have been grossly oversimplified

as shown by the most recent documentation of a variety of site types. According to the traditional view, small bands were thought to occupy single river valleys in which they hunted and gathered (Bense 1994). Sites were presumed to result from short term occupations lasting no longer than a season (Smith 1986). This description of settlement patterns has in turn led to a simple interpretation of social structure. Only recently has the dating of mounds to the Middle Archaic been accepted at sites such as Horr's Island Archaic, Tick Island, and Watson Brake. Over sixty other mound sites in the Southeast are now known to date to the Middle and Late Archaic (Russo1996). The presumed labor and organizational demands of mound building do not fit simple interpretations of settlement patterns and social structure. Furthermore, some prehistoric sites such as John Forrest, Denton, Jaketown, Slate, Watson Brake, and Keenan Bead Cache exhibit a complex and involved stone-bead manufacturing industry, inexplicable in simple reconstructions of Mid-Holocene lifeways.

The John Forrest Site

The John Forrest Site is located in Claiborne County, Mississippi, south of Port Gibson, about three km east of the present channel of the Mississippi River. The site is situated on a ridge above James Creek, occupying an area 420 meters north-south by 245 meters east-west, as determined by shovel testing. Today, the property is used as a hunting camp.

Over the last ten years, the John Forrest Site has been plowed and planted with deer feed. This has allowed the landowner, John Forrest, to surface collect the site. According to the landowner the site has been surface collected a countless number of

times under a variety of conditions. However, surface assemblages are often biased toward artifacts that can be easily seen or with formal shapes, such as bifaces or cores. Despite these biases, the John Forrest Site surface assemblage is large and very diverse.

I was introduced to the John Forrest Site during a field archaeology course directed in the summer of 2000 by Drs. Amy Young and Philip Carr. Formal archeological investigations at the John Forrest Site are limited to work done that summer. Shovel tests were excavated on a 5-meter grid at the southern part of the site with additional shovel tests excavated at various intervals to determine site boundaries. The investigation of the southern portion of the site was more intensive because the landowner had observed that beads and Middle Archaic hafted bifaces were most common there. Shovel tests also provided an understanding of stratigraphy and artifact density. A total of 534 shovel tests were screened through 1/8-inch mesh which resulted in the recovery of a large sample of lithic artifacts, including several microdrills. Shovel tests revealed no archaeological deposits below the plow zone. Also, seven 1x1-meter units were excavated to further examine site stratigraphy, recover a larger artifact sample, and search for features. No features were found, but the depth of the plow zone was consistently 20-25 centimeters in the southern end of the site and a large lithic assemblage was recovered. Unlike the landowner's collection, the excavated assemblage is systematic and unbiased. However, this thesis is an examination of the surface collection only, as it is larger and more varied.

The John Forrest surface collection and the data recovered from the test units and shovel tests are very different. A subjective examination of the two assemblages suggests that generally the artifacts collected by the landowner are larger and brighter in color.

The surface collection is further biased in containing more formal artifacts such as hafted bifaces, beads, and groundstone, but John Forrest was aware of the importance of cores and routinely collected these and the surface assemblage even contained a minor amount of flake debris.

Regional Sites for Comparison

Research in Mississippi and Louisiana has revealed other Middle and Late Archaic sites with similar artifact assemblages as the John Forrest Site (Figure 1). These sites have the potential to play a significant role in examining the rise of cultural complexity in the region. Recent excavation and artifact classification of the Watson Brake Site assemblage make it particularly useful for comparisons to the assemblage from John Forrest. In contrast, most of the site reports contain only minimal data and use a variety of classificatory schemes, which makes inter-site comparisons difficult. However, descriptions of artifacts, explanations of fieldwork, and understanding the scientific paradigms that were dominant at the time reports were produced helped in transferring the information to a comparable form. Six sites were chosen for comparison with the John Forrest collection and these are: Watson Brake (Johnson 2000), Jaketown (Ford, Phillips, Haag 1955), Denton (Connaway 1977), Keenan Bead Cache (Connaway 1981), Slate (Lehmann 1981), and Cad Mound (Gibson 1968). Due to the presence of mounds or certain artifact classes, such as chert beads, these sites have the potential to aid in reinterpreting Archaic period lifeways.

The lithic assemblage from Watson Brake closely resembles that from John Forrest. During the analysis of the artifacts from the John Forrest Site, several methods

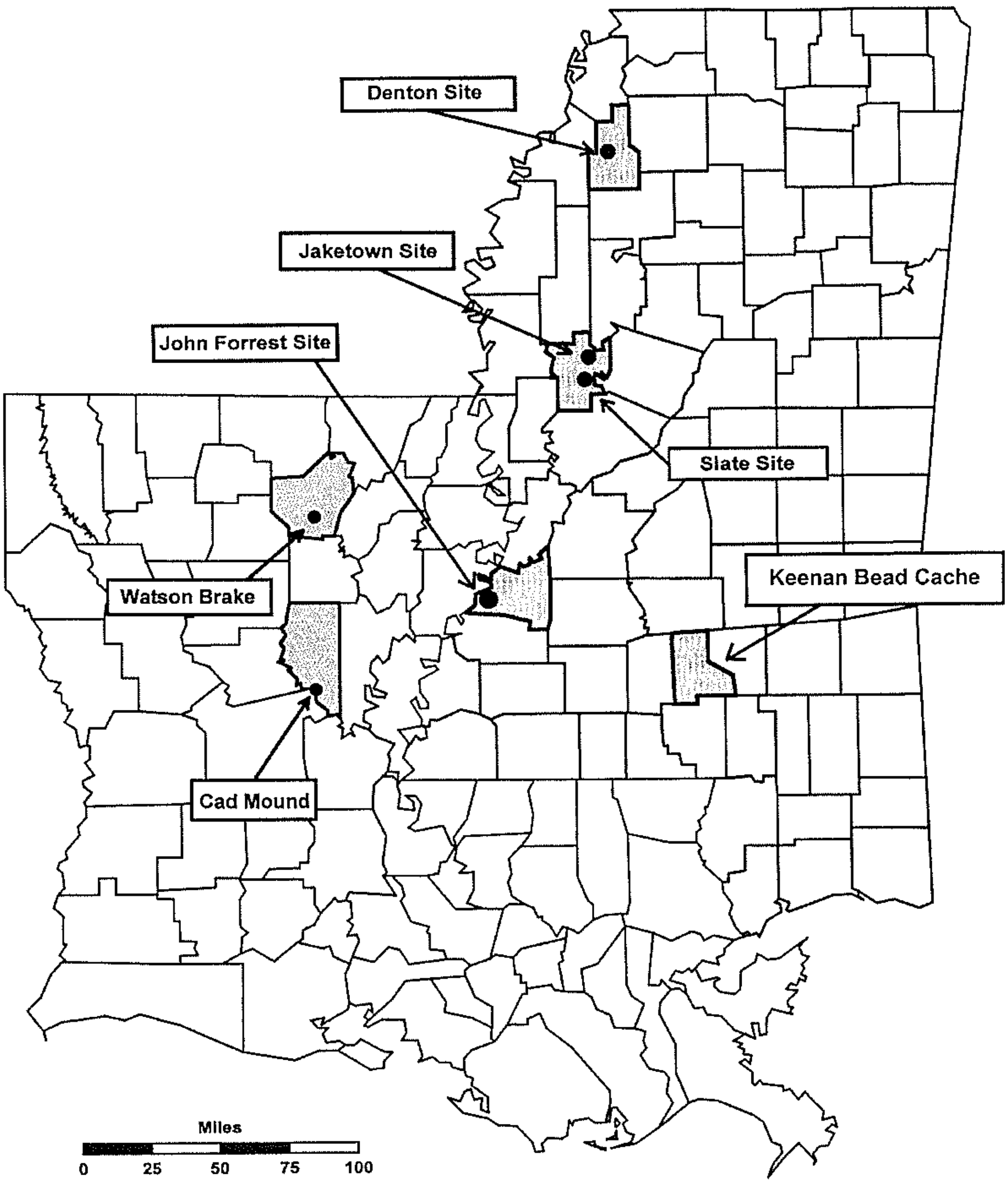

Figure 1: Map of site locations discussed in text.

used by Jay Johnson (2000) in the analysis of the Watson Brake lithics were replicated to make comparison between the two sites direct and straightforward. Johnson's methods were the best for this purpose because his analysis was the most recent and emphasized artifact attributes that are similarly important in the interpretation of the John Forrest lithic assemblage.

Watson Brake is a Middle Archaic site located in Northeast Louisiana, just south of the city of Monroe. The site is made up of 11 mounds built on an oval embankment (Johnson 2000). Excavations at Watson Brake were limited to eight test units located in the mounds and the lithic assemblage is thought to represent an "industry with strong evidence of adaptation to a specific set of functional demands" (Johnson 2000:95). Over half of the Watson Brake lithic assemblage is comprised of flakes smaller than ¼ inch, which could not be used in comparison with John Forrest surface assemblage due to differing recovery techniques. Artifacts at Watson Brake that were important for comparison were bifaces, hafted bifaces, beads, flake cores, blade cores, groundstone, and plummets.

Jaketown is located in south-central Mississippi four miles north of Belzoni in Humphreys County. Jaketown is a mound site discovered first by the infamous antiquarian Clarence B. Moore in 1908, but he did not excavate there (Ford, Phillips, and Haag 1955). The site was rediscovered in 1941 and a large surface collection was made with formal excavations in 1946, 1950, and 1951. Much of the site is a large mound complex with Poverty Point objects demonstrating Jaketown's temporal overlap with Poverty Point, during the end of the Late Archaic. Poverty Point objects are clay balls thought to be employed as part of a cooking technology. Some of the smaller mounds on

the site and the areas of surface collection were described as pre-ceramic but within the Poverty Point Period (Ford, Phillips, and Haag 1955).

The artifact assemblage recovered during the Jaketown project was vast. Artifact classification was thorough, containing many specific subgroups. Several artifact types were first described in the 1955 Jaketown report, which is a source cited ubiquitously in the literature concerning stone tools for this region. Jaketown produced a large lithic collection consisting of microdrills, bifaces, scrapers, hammerstones, groundstone, and polished ornaments (Ford, Phillips, and Haag 1955).

The Denton Site dates to the Middle Archaic and is located in Quitman County, Mississippi near the town of Lambert (Connaway 1977). Denton is similar to Jaketown in that it is located on an oxbow lake of the old Ohio-Mississippi River (Connaway 1977: viii). The site was excavated in 1969 after some bulldozing of the site had already taken place (Connaway 1977: 1). The Denton assemblage includes flake cores, numerous bifaces, hafted bifaces, beads, and groundstone, the classification of these artifacts is similar to the Jaketown typology.

In 1876 in Jefferson Davis County, Mississippi, a farmer plowing his field uncovered a feature containing 469 stone objects, both human modified and unmodified (Connaway 1981). The collection, minus 16 objects kept by the landowner and four others recorded as being "disposed of," were reported by Charles Rau and donated to the Smithsonian in 1878. The collection contains an array of beads, bead preforms, and zoomorphic beads including 295 chipped stone beads comparable to those at the John Forrest Site and Watson Brake.

The Slate Site is located directly south of Jaketown along an abandoned belt of

the Mississippi River in Humphreys County, Mississippi (Lehmann 1981). The site was determined to be contemporaneous with the Poverty Point culture based on similarities in the lithic assemblages (Lehmann 1981:50). Slate, however, lacks as many artifacts diagnostic to Poverty Point as it contains, including a lack of Poverty Point objects. Gary and Ponchatrain hafted bifaces were recovered from Slate and these date to the Late Archaic. The Slate collection includes mostly beads with a few plummets, bifaces, and blade cores.

Cad Mound, a LaSalle Parish site, is located six miles southwest of Walters, Louisiana and directly south two hundred yards from Catahoula Lake (Gibson 1968). The site contains one conical mound described as "sixty feet in diameter and six feet high" before it underwent modifications due to land alterations (Gibson 1968:3). Limited testing at Cad Mound resulted in the recovery of projectile points dating to the Late Archaic and many polished stone artifacts and Jaketown perforators. Gibson refrained from defining the site as dating to the Poverty Point period because of the absence of Poverty Point objects and he outlined the differences in Poverty Point beads and Cad beads. The Cad Mound assemblage also contains bifaces, hafted bifaces, groundstone and cores, but no data specifics or counts were reported for these artifact classes.

The sites chosen for comparison with John Forrest are not the only Middle or Late Archaic sites with mounds or beads in the Southeast. However, finding published data for comparisons was difficult and each site chosen here has a published report of some kind. Also, while comparative data from Middle Archaic sites lacking beads or mounds would further contextualize the John Forrest assemblage, such a comparison is beyond the scope of this thesis.

Analysis of the John Forrest Site Assemblage

The analysis of the John Forrest Site assemblage proceeded through many stages over a three year period. First, artifacts were grouped into techno-functional categories such as biface, bead, core, etc. The next stage was analysis within categories, some concentrating on morphology, such as the bifaces, and others on a production trajectory, such as the beads. Re-analysis of portions of the assemblage was conducted as the variability in specific artifact classes, such as cores and bifaces, was better understood.

Raw material was an attribute recorded for each individual artifact and some characterization of size for each artifact was also made. Raw material analysis at the John Forrest Site employed a macroscopic approach due to its simplicity and wide employment, as well as the prior observation that the majority of artifacts were manufactured using lithic materials that fall within the range of variability of secondary creek deposits in the area. In examining groundstone artifacts, identification of raw material was based on composition according to rock morphogenesis: igneous, metamorphic, and sedimentary (Andrefsky 1998). Raw material types were compared to those reported at Middle Archaic sites in the region, with a focus on whether local or non-local materials were used.

Bifaces are a large part of the John Forrest Site surface collection and are defined by Andrefsky as (1998:xxi) "a tool that has two surfaces (faces) that meet to form a single edge that circumscribes the tool. Both faces usually contain flake scars that travel at least half-way across the face." In this study, bifaces were further differentiated into hafted and non-hafted types.

In the initial analysis, it was noted that many of the non-hafted bifaces exhibited polish suggestive of a distinctive use, as opposed to simply representing a stage in the production trajectory for hafted bifaces as projectile points/knives. For this reason, each non-hafted biface was assigned to a morphological type: 1) two square ends and parallel sides, 2) one square end and a pointed or rounded tip, 3) round, 4) square end and incomplete end, 5) medial section, 6) pointed or rounded tip and an incomplete end, 7) fragmented with only a corner of biface remaining, 8) triangular, 9) broken base of triangular shaped biface, 10) fragmented so that only one bifacial edge remains, 11) drill-like biface, and 12) amorphous or none of the above.

Additionally, each non-hafted biface was numbered and the following attributes were recorded: weight, length, width, thickness, polish, heat treatment, technology, cortex, and failure type. The weight was measured to the nearest tenth of a gram. Length, width, and thickness were measured with digital calipers to the nearest tenth of a millimeter. Polish was observed with the naked eye and recorded as present or absent. Heat treatment was recorded as present if there is a visible waxy sheen and color change and/or evidence of heat damage (i.e., potlids or crazing). Bifaces were further assigned to one of four categories based on the last type of technology used in the production process: (1) hard hammer; (2) hard hammer and soft hammer; (3) soft hammer and retouch; and (4) retouch. Cortex is the weathered outer surface of the rock and can commonly be detected by a color and textural difference. Cortex was recorded as one of three attribute states: (1) absent, (2) present on one face, or (3) present on two faces. Biface fractures were characterized following Johnson's (1979:25-26) typology. Fracture categories used were: none, hinge, incipient fracture, edge collapse, lateral snap,

perverse, reverse, thermal, impact, transverse hinge, lateral hinge, post-depositional, indeterminate, and longitudinal reverse. Combinations of these fracture types were occasionally observed on single bifaces.

Hafted bifaces were analyzed in a similar manner to bifaces, but with some additional attributes examined. Added metric measurements recorded with digital calipers to the nearest tenth millimeter were: blade length, haft length, total length, maximum width, haft width, shoulder width, neck width, maximum thickness, and blade thickness. Weight was recorded to the nearest tenth of a gram. Failure types were the same fourteen listed previously, with the addition of haft snap, and cortex was recorded exactly the same. Basal shape was designated as: (1) incurvate, (2) excurvate, (3) straight, (4) bifurcate, and (5) indeterminate. Polish was noted if present on any portion of the hafted biface. Finally, hafted bifaces were assigned to morphological types according to the recently published Mississippi projectile point guide produced by McGahey (2000).

Debitage is defined by Andrefsky (1998:xxii) as "detached pieces discarded during the reduction process" and these artifacts were sometimes surface collected by the landowner of the John Forrest Site. However, the collection of this artifact type is biased by what could be easily seen on the surface and therefore is not a good representation of flake debris variability at the site. Analysis of flakes was limited to determination of blades (flakes twice as long as wide) and non-blades. Macroscopic damage to flake edges was noted when present.

Andrefsky (1998:xxii) defines a core as a "nucleus of rock that shows signs of detached piece removal. A core is often considered an objective piece that functions

primarily as a source for detached pieces." John Forrest cores were initially divided into two types: blade cores and flake cores. Blade and flake cores were identified following Jay Johnson's (2000) definition employed in the analysis of the Watson Brake assemblage. Blade cores were those having at least one flake scar that is twice as long as it is wide. Flake cores were those lacking blade removals and having flake scars from more than a single platform. Attributes recorded for blade cores were: number of platforms, number of platform facets, number of platform flake scars, number of complete blade scars, number of blade remnants, and other flake removals. Cortex was recorded as 0%, 1-49%, and 50-99%. Weight, to the nearest tenth gram, and maximum dimension, to the nearest tenth millimeter, were the only metric measurements recorded. Three morphological types, Mushroom-shaped, Clam-shaped, and Other, were assigned during the analysis in an attempt to identify common production techniques. Mushroom-shaped blade cores were those with a large striking platform and tapering end. Clam-shaped blade scars were somewhat flattened with blades removed from opposite directions of the same platform. Those cores which did not fit either of these two types were classified as Other. Quality of blade cores was subjectively assessed based on how well the cores provided blades and recorded as good, moderate, or poor.

Flake core analysis was a simplified version of the blade core analysis, due to the conventional nature of this technology for the Middle Archaic. The same attributes recorded for Watson Brake flake cores were recorded for John Forrest flake cores: weight (in grams), maximum dimension (in millimeters), and number of flake scars.

Beads at the John Forrest Site are a major point of interest due to their relatively rare recovery at Archaic sites along with artifacts related to bead production. Bead

analysis followed Jay Johnson's (2000) "Watson Brake Bead Trajectory" model. Johnson (2000:100) designates four stages for bead production: stage one, rough trifacial and quadfacial chipping; stage two, grinding begins; stage three, grinding complete; stage four, hole drilled through middle. For this analysis, Johnson's stage two was subdivided into three parts: a) grinding limited to the ridges of flake scars, b) grinding on flake ridges and the lower part of the flake, and c) grinding nearly complete, but still some evidence of flake scars. An additional stage was added for this analysis, stage five, finished bead, with completely ground edges and a completed hole through the center. Additionally, heat treatment, amount of cortex (0%, 1-49%, 50-99%), and number of flaked faces (for stage one and two) were recorded. For stages two to five, a hand lens was utilized to check for striations from grinding, as observed in the Watson Break bead assemblage. For bead analysis, the diameter of the drilled hole, whether complete or not, was recorded in millimeters. Length, weight, width, and thickness were also recorded. For beads that no longer had distinguishable facets, the thickness and width were recorded as the maximum thickness. For beads that had not been completely ground smooth and rounded, width was recorded as the greatest measurement between two facet edges, and thickness was the greatest measurement between the two flat surfaces.

Ground," pendant-like" beads are another part of the collection. These beads were put through nested screens to determine a size grade; weight was recorded for each size grade. For each size grade, a count was obtained for each of the three types: ground, incised line, or both.

Groundstone and pecked stones were a challenging part of the analysis because of the fragmented state of the stones, but each was assigned a morphological type. Raw

material was recorded for each piece, along with weight. If a tool was complete, length, width, and thickness were also recorded. The presence of use-polish was recorded when observable macroscopically.

Results and Comparisons

This section begins with a short discussion of raw material at John Forrest, followed by discussions of individual artifact classes. The results of the artifact analysis are presented with comparisons to the five other assemblages (Table 1). In Gibson's Cad Mound report, there was no specific data on each artifact class and Lehmann's discussion of the Slate Site had counts for only two of the artifact classes that were relevant to comparison with John Forrest.

Table 1: Comparison of five site assemblages to the John Forrest surface collection.

	Bifaces	Hafted Bifaces	Chipped Beads	Flake Cores	Blade Cores	Ground & Hammer-stones
John Forrest: Count Total %	1,283 57.2%	368 16.4%	99 4.4%	100 4.5%	322 14.4%	70 3.1%
Watson Brake: Count Total %	51 17.2%	24 8.1%	7 2.4%	159 53.7%	16 5.4%	39 13.2%
Jaketown: Count Total %	551 48.4%	177 15.5%	2 0.2%	0	374 32.8%	35 3.1%
Denton: Count Total %	504 50.5%	293 29.3%	88 8.8%	102 10.2%	0	12 1.2%
Keenan Bead Cache Count Total%	0	0	295 100%	0	0	0

Raw Material

Some variability exists, but the majority (n=1205, 94%) of raw material used in the production of chipped stone tools at John Forrest was tan gravel chert. Gravels of a specific size and shape were chosen for individual artifact classes and perhaps of a certain color for beads. Blade cores were almost exclusively made out of "egg-shaped" pebbles, at John Forrest, Jaketown (Ford, Phillips, and Haag 1955), and Watson Brake (Johnson 2000). Ford, Phillips, and Haag (1955:137) note that at Jaketown these pebbles were "selected" for their size and shape, and Johnson (2000:98) alludes to the convenient shape and size of the raw material for blade core production at Watson Brake. With regard to color, information from Denton (Connaway 1977:75), Jaketown (Ford, Phillips, and Haag 1955:126) Keenan Bead Cache (Rau 1878:293), Slate Site (Connaaway1981:40), and Cad Mound (Gibson1968:5) all mention beads made of red "jasper." Over two-thirds (n=71; 72%) of the John Forrest beads had a reddish color either naturally or by heat treatment. This pattern of red beads leads to the hypothesis that red was a commonly desired color for chert beads and that raw material may have been chosen specifically for that color or modified to produce that color as in the case of John Forrest.

The gravels represented in the John Forrest collection can be obtained from nearby James Creek. Samples from the creek collected during the 2000 fieldwork compare favorably with the artifact assemblage and the James Creek gravel bars are the assumed source of raw material. Other raw material used for knapping included small amounts of Fort Payne chert (n=61, 5%), an even smaller percentage of Tallahatta Quartzite (n=7, 0.6%), and unidentified raw materials (n=10, 0.8%). The presence of

these materials may indicate a minimal amount of trading took place, because these materials are not available locally. Tan or yellow chert pebbles were reported as the major raw material utilized for the manufacture of chipped stone tools at Watson Brake (Johnson 2000), Denton (Connaway 1977), and Slate (Lehmann 1981) and these were locally available at each site. No data is available for Cad Mound.

The groundstone raw material greatly differs from that of the chipped stone at John Forrest. The pecked and groundstone tools are mostly made up of quartz arenite sandstone, quartzite, or other well consolidated igneous or metamorphic material assumed to be available in local gravel bars. Denton (Connaway 1977), Watson Brake (Johnson 2000), and Jaketown (Ford, Phillips, and Haag 1955) all contain groundstone made of reddish sandstone, but no quartzite artifacts are reported. The Slate Site reported the use of slate for the artifact assemblage (Lehmann 1981). Unmodified petrified wood and quart crystals were also found at John Forrest and Watson Brake (Johnson 2000), but it is unknown where exactly these materials are available in relation to both sites. Overall, the John Forrest raw material shows little support for outside trade, but rather an extensive use of local gravels.

Bifaces

Bifaces (n=1,283; 53%) compose the largest artifact class in the John Forrest surface assemblage. Two stages of analyses were conducted on the non-hafted bifaces, with heat treatment, morphology, and amount of polish recorded in the second stage. To minimize bias in the observation of failure types (e.g. Beck and Jones 1989), this attribute was re-examined during the second analysis. The vast majority of the bifaces are broken

(n=1,098; 86%). All non-hafted bifaces were categorized by morphology: 1) two square ends and parallel sides (n= 42, 3.3%), 2) one square end and a pointed or rounded tip (n=90, 7.0%), 3) round (n=29, 2.3%), 4) square end and incomplete end (n= 327, 26.0%), 5) medial section (n=180, 14.0%), 6) pointed or rounded tip and an incomplete end (n=437, 34.1%), 7) fragmented with only a corner of biface remaining (n=41, 3.2%), 8) triangular (n=9, 0.7%), 9) broken base of triangular shaped biface (n=8, 0.6%), 10) fragmented so that only one bifacial edge remains (n=4, 0.3%), 11) drill-like biface (n= 27, 2.1%), and 12) other (n=89, 7.0%). The majority of the bifaces have incomplete lengths with squared, rounded, or pointed ends (Figure 2).

Length, width, thickness, and weight measurements were taken on all bifaces but only the data for complete bifaces are presented (Table 2). The size of the non-hafted bifaces in terms of width and thickness were fairly uniform, while length and weight varied more among specimens and were resharpened. This is probably due to the fact that these bifaces served a common function. It is difficult to compare the data to Watson Brake, because Johnson presents data for each production stage.

Table 2: Measurements of complete bifaces from the John Forrest surface collection

	Average	Std. Deviation	Minimum	Maximum
Weight (g)	29.20	18.13	2.7	139.0
Length (mm)	54.87	11.99	32.2	102.8
Width (mm)	35.46	7.74	12.8	71.8
Thickness(mm)	14.11	3.54	7.3	31.6

Polish was observed with the naked eye and approximately 81% (n=1,041) of the bifaces exhibit some degree of polish (Figure 2). Most often the polish was limited to the margins of the flake scars, such that flaking had occurred after the use of the tool. The high frequency of polished bifaces suggests a heavily repeated use for the tool. However,

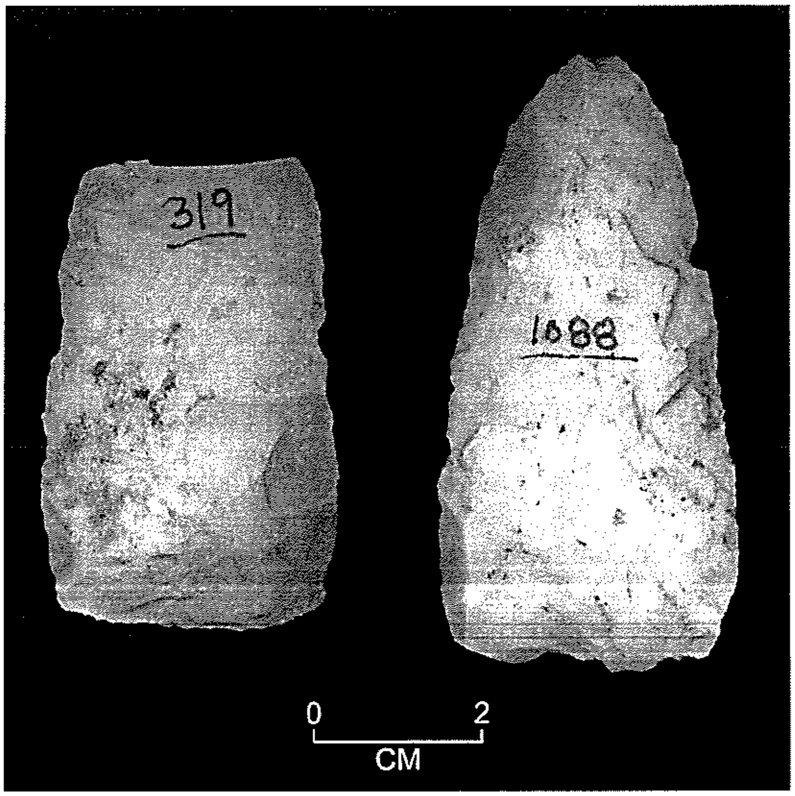

Figure 2: Typical examples of non-hafted bifaces exhibiting polish.

until experimental analysis is conducted on use-wear for bifaces made of tan gravel chert, the exact cause for the polish cannot be determined. It is tentatively suggested that this polish may have resulted from heavy wood working.

Polish was not observed on the bifaces from Watson Brake. Polish was reported on "many specimens", but not systematically recorded for Jaketown choppers, (Ford, Phillips, and Haag 1955:119). The descriptions and illustrations of Jaketown choppers are similar to John Forrest polished bifaces. Connaway (1977) noted polish at the macroscopic and microscopic levels on Denton bifaces, these counts only represent what was observed with the naked eye: adzes (n=2), choppers (n=4), and Baytown Period choppers (n=2). The high percentage of bifaces with polish at the John Forrest Site suggests a special activity or the intensive expression of an activity.

Heat treatment was determined by the presence of the characteristic waxy sheen, discoloration, or potlids. Only 25% (n=327) of the John Forrest bifaces had been heat treated and 30% (n=98) of bifaces that were heat treated were also fractured by thermal damage.

Bifaces were assigned to one of four categories based on the last type of technology used in the production process: 1) hard hammer (n=1, 0.1%); 2) hard hammer and soft hammer (n=33, 2.5%); 3) soft hammer (n=717, 55.9%); and 4) soft hammer and retouch (n=532, 41.5%). Surprisingly, all of the bifaces but one were modified by either soft hammer or retouch. This is extremely interesting because the site lacks a manufacture trajectory such as the one at Watson Brake. If such a trajectory were present, one would expect a relatively large number of manufacture failures during early and middle stages of production. Perhaps the early and middle stages of production

using hard and soft hammers were done at the gravel bar and only completed tools were then transported to the site for further reduction.

The raw material source for the tools recovered from the John Forrest Site are gravels, and the cortex is commonly a water-rolled outer surface. Cortical amount is important on John Forrest artifacts to determine the relative size of gravels before modification and to determine how much modification the raw material underwent. The majority of bifaces (67%, n=858) at John Forrest had no cortex when they were discarded. This data suggests the raw material was of an adequate size for making bifaces and a moderate amount of reduction was completed before it was ready for use.

Biface fractures were characterized following Johnson's Yellow Creek typology (Johnson 1979:25-26). The majority of the fractures observed were lateral snaps (n=337, 34.6%). Lateral snaps, according to Johnson (1981), have several subclasses of breakage patterns due to different forces causing the failure. It is noted that the occurrence of most of these failures is related to production, although end shock may be related to use, which is impossible to distinguish from production breakage in an archaeological assemblage (Johnson 1981:27). The occurrence of more than one fracture type for a single biface was observed on 506 bifaces, the most common fracture combination is incipient fracture and lateral snap (n=105, 10.7%). Johnson (2000:96) reports that Watson Brake bifaces were fragmented, but fracture types were not reported, and only a few were complete enough to measure (length n=31, width n=49). Data on biface failure types at the other sites are not available.

Overall, a large percentage of John Forrest bifaces (76% n=974) had recognizable fracture types (Figure 3). However, due to the amount of polish exhibited on the bifaces

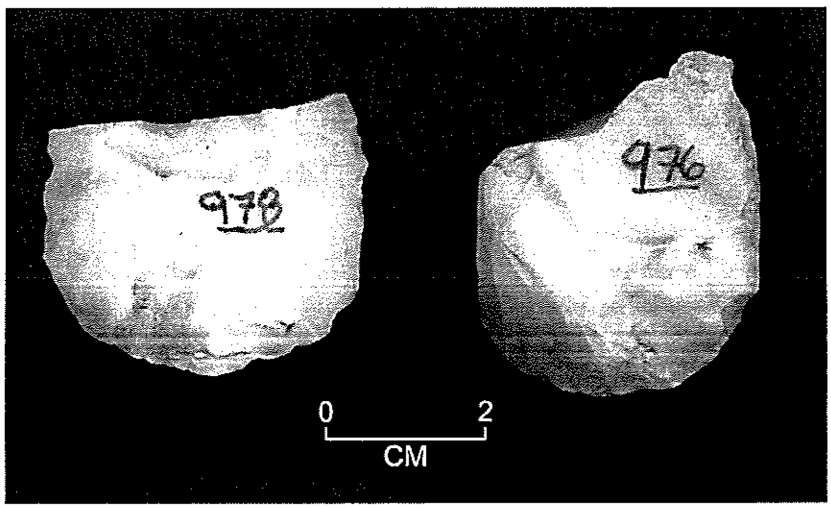

Figure 3: Typical biface fracture patterns.

it is apparent that they were used before breaking. Most of the tools show evidence of use and then resharpening, so it is possible that the bifaces represent rejects from a second or even a third resharpening which could account for the high percentage of lateral snaps. Overall bifaces at John Forrest do not represent unused tools, but reflect a specific use that created a highly polished edge and consistently fractured the bifaces before they could be exhausted by use and retouch. Experimental manufacture, use, and examination of resulting fracture patterns and polish would do much to shed light on this artifact class. In contrast to the John Forrest bifaces, Johnson (2000) found that Watson Brake bifaces were either unfinished (tools that had not been completely reduced due to some flaw or defect in the raw material) or hafted bifaces.

Hafted Bifaces

Hafted bifaces were identified as any biface with some type of basal modification, but not all specimens had diagnostic hafting. The total number of hafted bifaces is 368, which is 16.5% of the total surface assemblage and 140 (38%) of those are types thought to date to the Middle Archaic. The remaining specimens are either Late Archaic or are too fragmented to accurately assign to a type. Metric measurement data are provided for complete hafted bifaces in Table 3.

Middle Archaic hafted bifaces were assigned to morphological types according to McGahey's recently published (2000) Mississippi point guide. A total of 82 Sykes-White Springs points represent the bulk of the diagnostic hafted bifaces (Figure 4). They generally are broad points with short straight stems, the haft being nearly as wide as the point. The shoulders are square with short indentations for a haft and lack barbs, although they may slope slightly downward. McGahey (2000:102-104) used the John

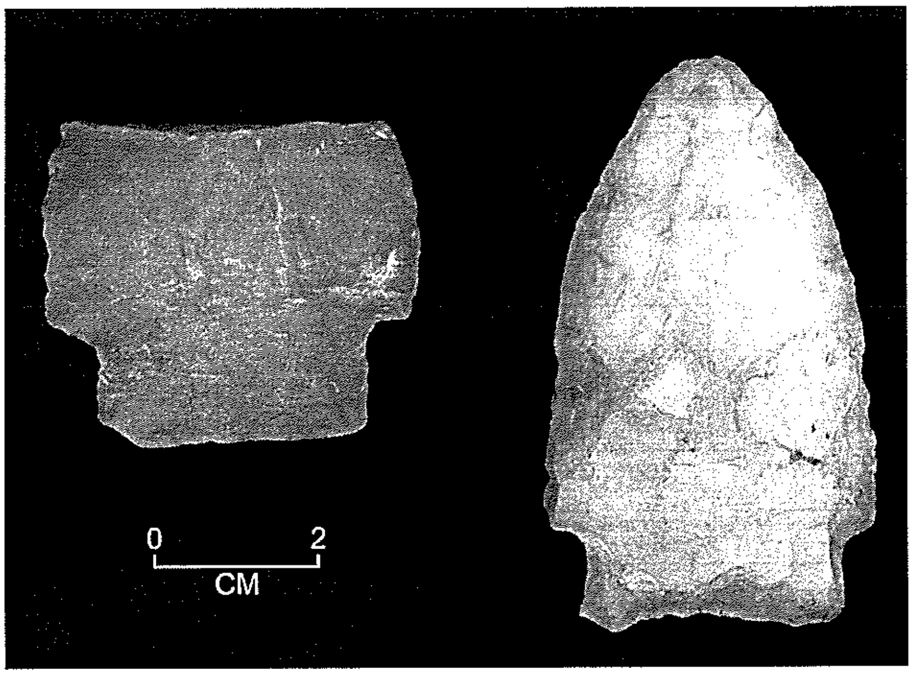

Figure 4: Typical Middle Archaic Sykes-White Springs hafted bifaces.

Forrest collection to illustrate the Sykes-White Springs type for the state. Of the hafted bifaces, 24 are Beachum points, but have similar characteristics to Ellis points. These points are usually medium in size with small corner notching and a short sometimes expanding base. The Watson Brake assemblage contains four Ellis points (Johnson 2000). Finding the same diagnostics at the two sites may indicate temporal overlap. Two points in the John Forrest collection are classified as Cypress Creek, and these have distinctively exaggerated corner-notching and an expanding base. Five points are Eva types. Fifteen points are Morrow Mountain type. Eight points are Denton type, with narrow shoulders and straight stems that can be fairly long. Denton points were first defined in Connaway's 1977 report of the Denton Site.

Table 3: Metric measurements for complete hafted bifaces.

(mm)	Average	Std.deviation	Maximum	Minimum	Total
Blade length	47.63	12.08	78.0	15.2	79
Haft length	14.04	4.77	50.7	7.2	310
Total length	56.14	13.23	87.6	14.7	80
Max. width	34.94	7.18	57.8	15.3	364
Haft width	22.20	7.64	46.1	9.6	217
Shoulder width	33.97	6.95	54.0	17.4	228
Neck width	22.77	6.64	44.8	10.5	347
Max. thickness	11.24	2.51	42.9	5.7	368
Basal thickness	9.82	1.86	14.0	5.6	99
Weight	18.62	9.15	52.3	1.5	368

Gary points total 42 at John Forrest. This point is "basically triangular" with "tapered bases" and "random" flaking patterns (McGahey 2000). This point dates to the Late Archaic. Gary points are part of the assemblages at Jaketown, Denton Site, Slate Site, and Cad Mound, but not recorded in the small assemblage from Watson Brake (Ford, Phillips, and Haag 1955, Connaway 1977, Lehmann 1981, Gibson 1968, and

Johnson 2000). Other hafted bifaces are included in the John Forrest collection, most of which are too fragmented to accurately type. Overall, the majority of classifiable points are Middle Archaic, a small percentage of types not mentioned here are diagnostic for the Late Archaic (i.e. Motley).

Failure types were the same fourteen failures recorded for bifaces, with the addition of haft snap. Haft snapping occurred on 18 (5%) of the hafted bifaces and indicate breakage during use (i.e., Titmus and Woods 1986). The most common fracture was incipient fracture occurring on 98 (26.6%) of the hafted bifaces. Fracture types followed the same pattern as the non-hafted bifaces with a large percentage of lateral snaps.

Basal shape has five designated categories: (1) incurvate, (2) excurvate, (3) straight, (4) bifurcate, and (5) indeterminate. Of the assemblage, 35% (n=112) of basal shapes were recorded as excurvate and another 35% (n=112) as straight. Identifying basal shape aided in assigning points to diagnostic types.

Cortex was recorded as absent on 70% (n=257) of the hafted bifaces, which is similar to the unhafted bifaces and suggests a similar reduction strategy. Polish was observed on some of the hafted bifaces, which is somewhat surprising. It is generally assumed that hafted bifaces served as projectile points or knives, and neither of these functions is thought to result in polish formation. A more thorough examination of this polish is needed before a conclusion is made as to the source of the polish, but it is tentatively suggested that these hafted bifaces were used for heavy woodworking.

Debitage

Debitage was surface collected by the landowner of the John Forrest Site. However, it is biased by his general lack of interest in collecting this artifact type and apparently only contains debitage that could be easily seen on the surface. Therefore, it is not a good representation of flake debris variability. Analysis of flake debris involved identifying blades (n=397, 32%) from non-blades (n=772, 62%). Flakes with continuous flake removals along an edge that may represent use were noted (n=81, 6%), but no specialized analysis was conducted. An unbiased sample of flakes was collected during excavations of John Forrest and the results of that analysis will be included in a report of the 2000 season fieldwork.

Cores

John Forrest cores were divided into two types: blade and flake cores. Blade or flake cores with a bifacial edge were not classified as bifaces as they were at Watson Brake. While this makes comparisons less straightforward, it is thought to best represent the use of the artifact, basically the production of flakes from cores. The assemblage of bifaces at John Forrest is large and fairly homogeneous in morphology, making the inclusion of bifacial cores less practical than it may have been for Watson Brake. A bifacial core, as opposed to a biface, is a biface has two relatively flat parallel faces, whereas a bifacial core may have more than two flaked faces, perpendicular faces, cubical shape, or spherical-shape.

Attributes were recorded on 322 (14.4% of the assemblage, Figure 5) blade cores and these are: number of platforms, number of platform facets, number of platform flake

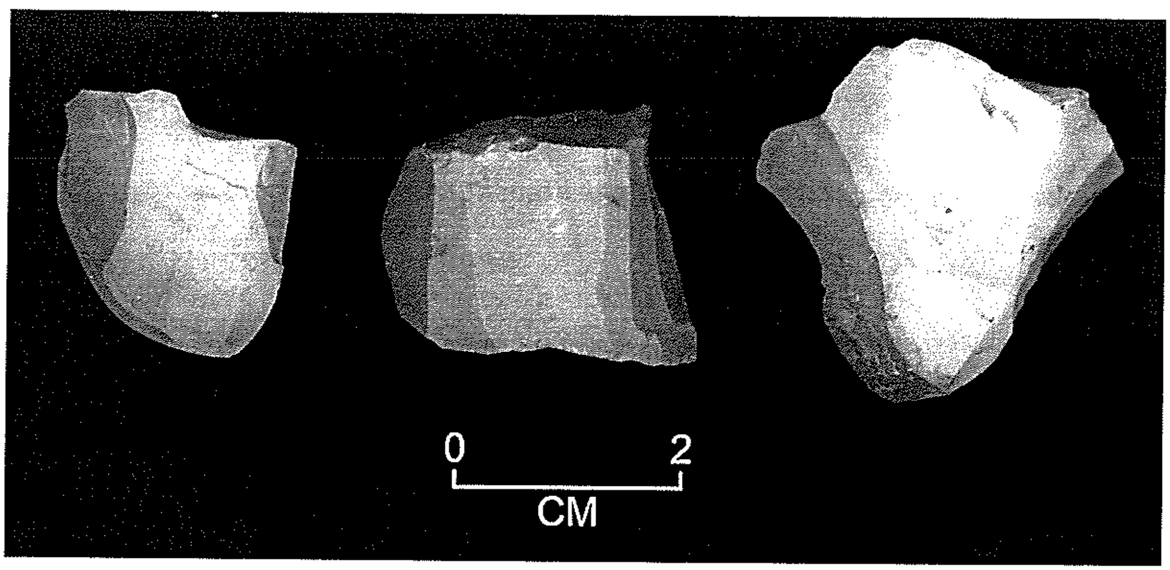

Figure 5: Typical blade cores in the John Forrest surface assemblage

scars, number of complete blade scars, number of blade remnants, and other flake removals. Platforms were defined as prepared flaked surfaces creating an edge from which blades could be taken off at a fairly obtuse angle. Often the angle of the blades in proportion to the platform was either 90° or very close to it. The maximum number of platforms on a John Forrest core was four, although the majority of cores had one platform (n=242, 75%). Watson Brake also had the vast majority of blade cores with only one platform, (n=14, 88%) (Johnson 2000). Platform facets were defined by Johnson to be "flakes removed in order to set up or maintain a platform" (personal communication, 2002). Platform facets varied, the most frequently occurring was zero, possibly representing an expedient technology at the John Forrest Site. Any other flake scars observed on the platform were recorded as well, although these were even less common than platform facets.

The number of complete blade scars was recorded. A blade scar was defined as any remnant flake removal twice as long as it is wide. For accuracy, if a scar appeared to closely approximate this definition of a blade, then the width and length were measured using digital calipers to make a final determination. All flake scars were counted and recorded separately for each unidirectional side. The maximum number of complete blade scars was five and, the average number of complete blade scars for each unidirectional core side was 1.2. Blade remnants were flake scars that were parallel with a blade, similar in shape and size, but incomplete because of additional flaking. The maximum number of blade remnants for a unidirectional side was 8, with an average of 1.3. The presence and high volume of blade remnants demonstrates the extensive work put into cores at John Forrest. The final count was of any other flake scar on each

unidirectional side, (average=5.8, standard deviation=3.9). Only 1% of blade cores had no cortex, which is probably a function of the size of the original nodule and only one or two faces being suitable for blade removal. Johnson (2000:98) and Ford, Phillips, and Haag (1955:137) all note that the use of these "egg-shaped" pebbles was appropriate for blade cores.

During the close analysis of these blade cores, several general shapes were observed. The classic blade core shape was the major type (n=242; 75%) and was termed "Mushroom-shaped" in this analysis. A less common form of blade core (n=44; 14%) was the "Clam-shaped" type. This type had blades taken off of the same platform in opposite directions, forming a bifacial edge. It is assumed that these artifacts would have been typed as bifaces in the Watson Brake collection. The Other category was composed of three very minor morphological shapes, which were: a shared platform and a separate platform from which blades were removed (n=4; 1.2%), blades removed at a 360° angle from a single platform (n=1; 0.3%), and the last had no prepared platform and had blades removed from a cortical surface (n=2; 0.6%). Quality of blade cores was subjectively assessed in respect to how well the cores provided blades, and the majority were considered of moderate quality (n=187; 58%).

The raw materials from which the blade cores were made are again the pebbles described as "egg-shaped" by Ford, Phillips, and Haag for Jaketown's similar core technology (1955). The average maximum dimension for John Forrest blade cores was 38.1 millimeters, and Johnson (2000) reports an average length of 32.7 mm for Watson Brake (Johnson 2000). Johnson (2000:98) notes that the Watson Brake blade cores are not intensively used because of the lack of platform rejuvenation and the low average of

blade scars (3.6). John Forrest blade cores do not compare to this because evidence of platform rejuvenation is more intense, although the combined data on remnant blade and complete blade scars is an average of 3.5.

Flake core analysis was modeled directly from Johnson's Watson Brake work. Flake cores were any cores not containing blade removals. The analysis of the 100 flake cores (Figure 6) in the John Forrest assemblage included: number of flake scars, maximum dimension, and weight. The maximum number of flake removals on a single flake core was 42 and a minimum of 8, an average of 18. On average, the size of the flake cores was slightly larger than blade cores (39.9mm), but there was less variability in size for the flake cores than with blade cores. The raw material was the same, small chert gravels, obtainable in James Creek. When compared to Watson Brake, it can be seen that the flake cores were more extensively utilized at John Forrest as well; the mean flake scar count on Watson Brake flake cores was reported as four (Johnson 2000). Raw material used for cores at both sites is similar. Johnson concluded the flake core technology was opportunistic and this description also fits the John Forrest flake cores.

Beads

Bead analysis for John Forrest followed Jay Johnson's (2000) "Watson Brake Bead Trajectory" model (Figure 7). The 99 artifacts representing various stages of bead manufacture in the John Forrest collection only make up 4.4% of the surface collection, but is over 14 times as many recovered from Watson Brake (n=7). Johnson (2000:100) designates four stages for bead production, in this comparison another stage was added and stage two was broken down into more specific categories. Stage one, (Figure 8) the

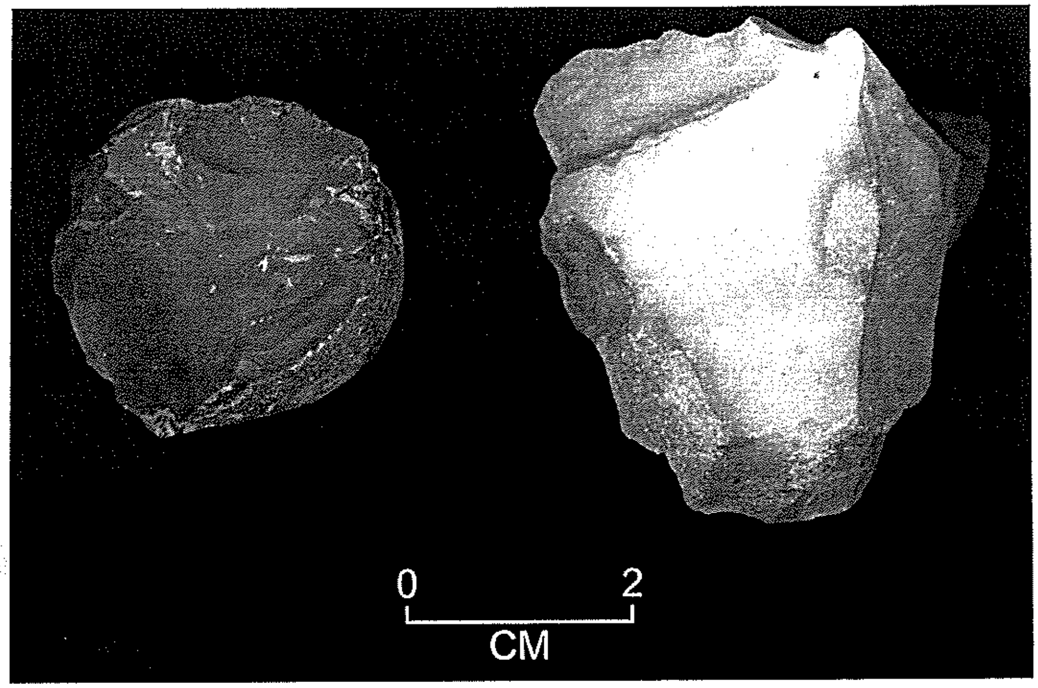

Figure 6: Typical cores in the John Forrest surface assemblage.

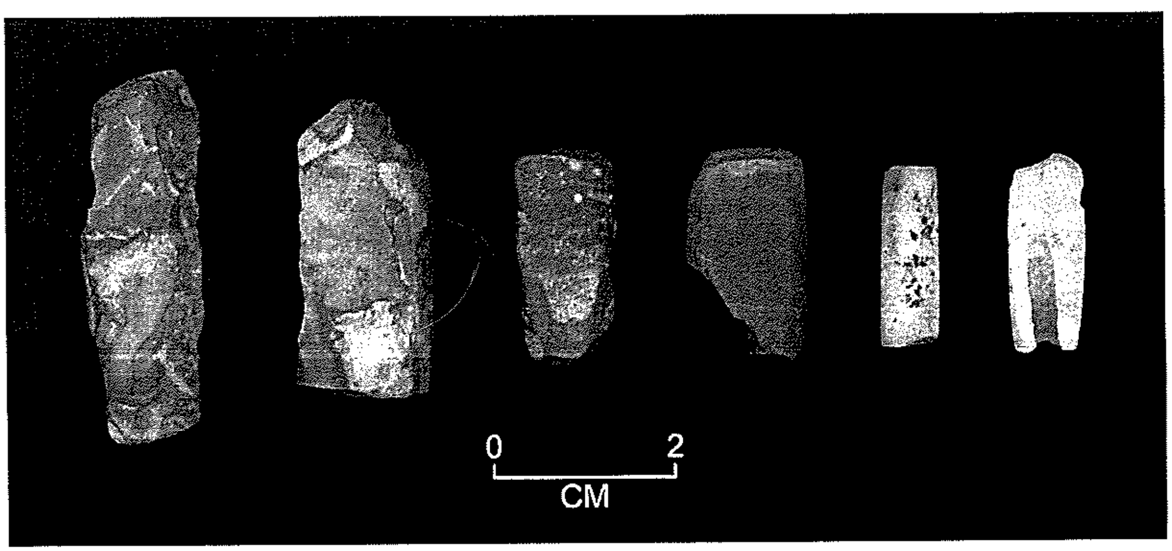

Figure 7: Stages of chert bead manufacture.

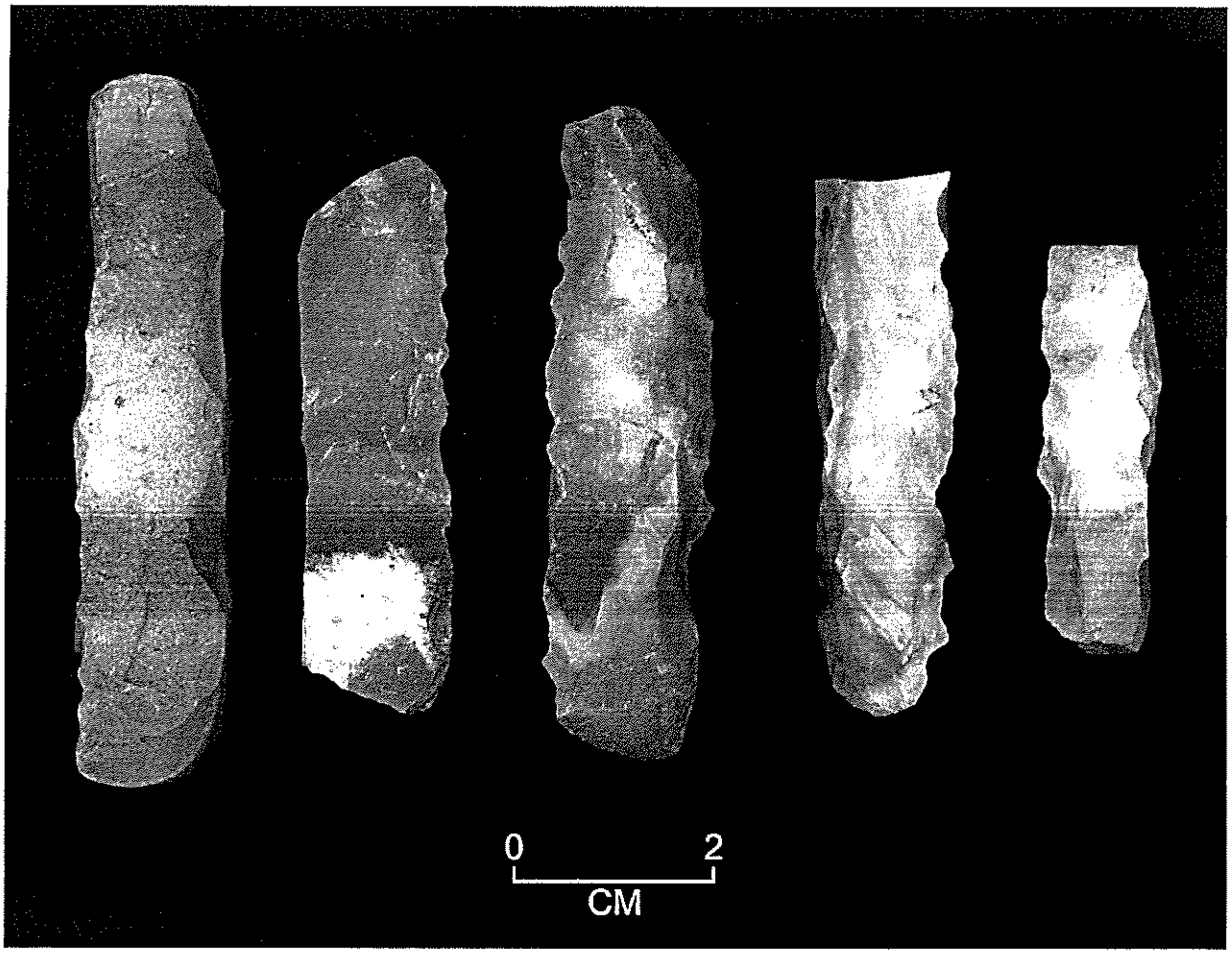

Figure 8: Chert bead preforms in the John Forrest surface assemblage.

bead is in the process of being chipped into shape and there is no evidence of grinding, was the largest category (n=66, 66%). Stage two was divided into three sub-stages: 2a designated as polish confined to the top of flake scar ridges (n=19; 19%); 2b polish on top of ridges smoothing them down and polish a little in the valleys of the flake scar (n=1;1%); and, 2c where ridges and valleys of flake scars almost completely ground down but still observable (n=6; 6%). Stage three with grinding completed had only one bead (1%), which was Johnson's hypothetical stage because he had no examples in his sample of seven beads (2000). Stage four, drilling begun (n=5), did not solely contain production rejects due to manufacture failures as did Johnson's stage four. Of the five beads (5%) that were assigned stage four, two were broken and the rest had the beginnings of drilled holes. Only one bead (1%) at the John Forrest Site was complete and assigned to stage five, but at Watson Brake there were two complete beads (Johnson 2000).

Fifty eight percent of the beads had evidence of heat treatment determined by the same methods used for bifaces. There are two possible explanations for the high percentage of heat treatment: 1) it was a method used to give the raw material a desired red color; 2) it was important to the manufacture process; or, 3) the reddish color made these beads stand out more against the soil and were more easily spotted during surface collection. These possible explanations need to be further examined, but ethnohistoric information of Southeast Native American lifeways does suggest that red may have had an important symbolic meaning to their ancestors.

Eleven of the 99 beads in the assemblage were so ground that it was impossible to detect any evidence of water-rolled cortex. Less than 50% of the beads (n=48) had cortex

still present. The raw material of the beads was mostly high quality chert pebble, and James Creek was probably the source utilized to obtain the chert pebbles for bead production; however, brighter colors make up the bead raw materials. At Denton, Keenan Bead Cache, and, Cad Mound the raw materials are called jasper instead of chert, but the same reddish color seems dominant. At the Denton Site (1977) a tubular bead is described as being made of a reddish quartzite, Keenan Bead Cache (1877) and Cad Mound (1968) describe their raw material for beads as red jasper. It is possible that these terms are actually describing the same type of raw material.

Johnson (2000) found that the beads at Watson Brake had striations from grinding perpendicular to the long axes of the beads. On beads with any evidence of grinding a hand lens was used to see if any striations were present. Of the 33 beads that had some amount of grinding, only 3 had what appeared to be striations. However, no distinct pattern was formed by these striations, although further analysis is warranted. In the report on Cad Mound, Gibson describes a chipped stone bead production that is identical to that of Watson Brake, John Forrest, and Keenan Bead Cache, with final products representing objects similar to these sites and the Denton Site. In the original 1877 Smithsonian Annual Report, Charles Rau illustrates a hand drawn image of Keenan Bead Cache chipped stone beads, one of which clearly show evidence of grinding and conforms to stage 2b.

Ground beads (n=4) are another part of the lapidary industry at John Forrest. These beads were not included in the total percentage at the site to make for straightforward inter-site comparisons. These beads are different from the chipped stone beads because the raw material is significantly softer. The soft greenstone can be easily

cut, ground, and drilled, without the chipping involved in production of chert beads. The collection contains two greenstone beads ground into cylindrical shapes, both approximately 39 mm long and 15 mm wide/thick. One similarly shaped greenstone bead has actually been drilled all the way through; its length measuring 27.9 mm and 17.1 mm wide. A tear-drop shaped pendant bead can be included in the greenstone bead manufacture (Figure 9). This bead may have been ground into this shape or its shape may be natural. Conical-shaped drilled holes (maximum diameter 4.2mm) are on both sides of the pebble, but not completely drilled through the stone. John Forrest also has 90 greenstone pebbles with sides that have been ground flat or with small grooves incised into them. These pebbles may represent a manufacture stage approaching, but not quite accomplishing, a recognizable bead. In an inventory of Keenan Bead Cache, 101 beads are described as "compressed or discoidal [in] shape" some of which have drilled holes (Rau 1877: 294). Gibson describes Cad Mound beads made by incisions, presumably by flake saws, into soft rock (1968:5). Both bead assemblages represent types present in the John Forrest collection. Denton Site had four drilled and 11 partially drilled pebbles similar to the "tear-drop" shaped preform found at John Forrest. Greenstone beads were not reported from Watson Brake, which makes their presence at John Forrest especially interesting.

Other Lithics

Groundstone and pecked stones contain the most raw material variability in the assemblage. The groundstone tools include five axe fragments (Figure 10), one made of chert, two of sandstone, one of quartzite, and one of unknown material. Two have highly

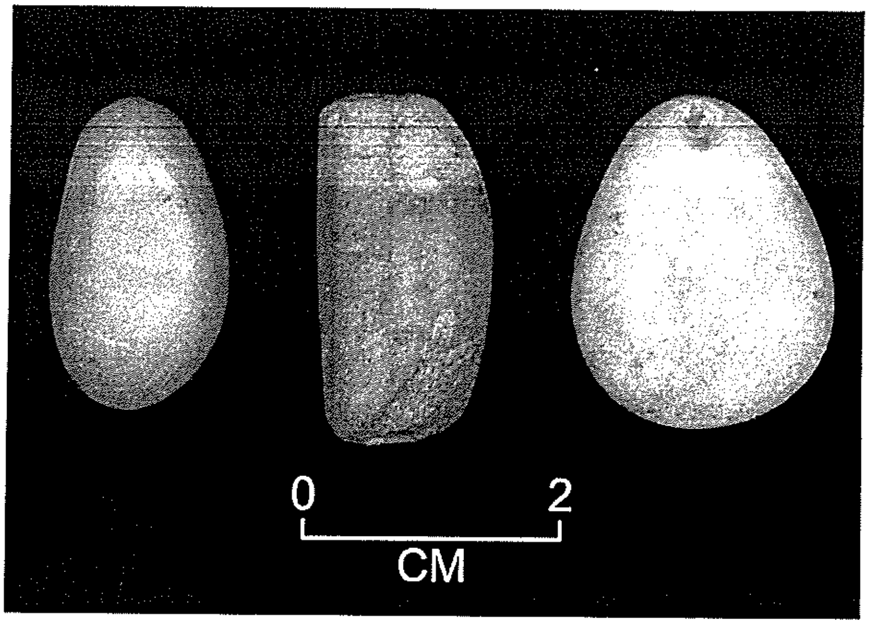

Figure 9: Examples of greenstone bead manufacturing stages.

Figure 10: Example of ground stone axe in the John Forrest surface collection.

polished bit ends. It appears that these stones were first pecked into shape and then ground.

Six polished stone fragments comprise a portion of the John Forrest collection. These artifacts are possibly the same as what is referred to at Cad Mound (Gibson 1968:4) and Jaketown (Ford, Phillips, and Haag 1955:122) as "bar gorgets." One of these polished stones is made up of a conglomerate rock with reddish-brown grains. Striations from polishing can be seen without a hand lens running parallel to the long axes of the stone. This stone was polished into a cylindrical shape weighing 88.4 grams. Three additional polished stone fragment are made of the same raw material as the smaller reddish-brown grain in the above conglomerate (possibly hematite). Weighing considerably less, 1.7 grams, one polished fragment does not show evidence of striations from grinding, while another does show striations parallel with the long axes. This fragment has sides highly smoothed and tapering to a perfectly flat bottom edge. The last one seems to have been broken during the drilling of a hole through the middle of it. The break is such that it appears to have snapped the stone in half, making it "L-shaped." Although it appears to have been polished, striations were not observed. The last polished stone with an unknown function appears to be made of deep red well-consolidated sandstone. It has been ground into the shape of a rectangle, expanding in thickness toward the center of the piece where it was broken (weight 48.2 grams). A last stone fragment made of quartzite weighs only 3.2 grams and is too fragmented to tell its original shape. The bar gorgets at Jaketown are theorized to be broken bannerstones, or atlatl weights. Table 4 records any object called a bar gorget in the atlatl weight count. The other sites report these artifacts as celts: Slate Site (n=3 Lehmann 1981), Cad Mound

presence noted (Gibson 1968), and Jaketown, the variety used for this comparison is termed "pebble celts," (n=3 Ford, Phillip, and Haag 1955:119).

An interesting artifact made of an igneous rock has been pecked into the shape of a plummet (weight 117.5 grams), but it lacks any evidence of a drilled hole. Johnson reports a high quality magnetite plummet at Watson Brake, with a biconical hole drilled through its apex (2000).

Abraders were defined for Watson Brake analysis as showing "evidence of wear on one or more facets and are small enough to have been moved back and forth while held in the hand" (Johnson 2000: 101). The John Forrest assemblage contains twenty-one abraders, most of which were made of quartzite and sandstone. They were all broken, with an average weight of 139 grams. Three broken hammerstones made of quartzite had a combined weight of 572.2 grams, all of which were made of quartzite gravels.

There are nine groundstones in the collection that were ground and then polished into symmetrical "diamond-like" shapes. It is possible the ultimate function of these artifacts would have been as atlatl weights, sometimes called bannerstones (Figure 11). One of these preforms has the beginnings of a drilled hole into its center, which atlatl weights required. The material they are made of are the same creek derived quartzite and sandstones.

Two large groundstone fragments are also contained in the John Forrest collection. One is a nutting stone (weight 194.4) with a ground circular area on one side and on the reverse side of the stone are a few shallowly incised lines. The other groundstone fragment was much larger (weight 386.3 grams) and only had evidence of

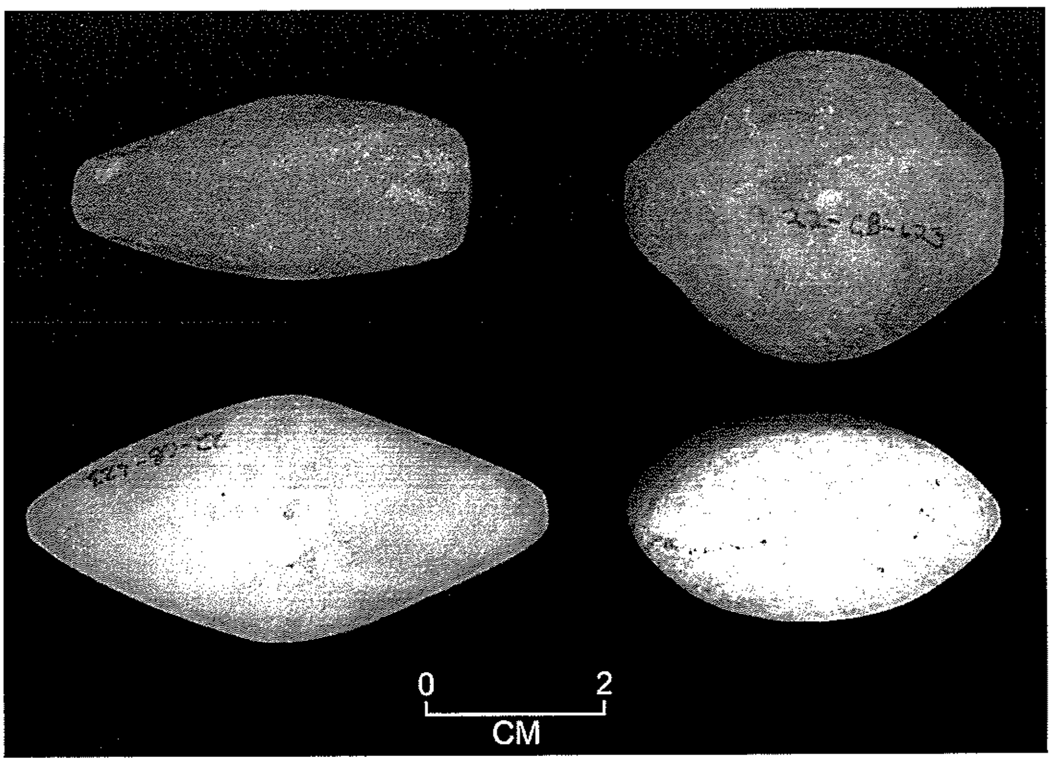

Figure 11: Examples of possible bannerstone preforms.

the lines ground into its surface. A total of 38 other groundstone fragments with unknown function make up the remainder of the John Forrest collection. The raw materials for all of the groundstone artifacts are homogenous, being mostly quartzite or well-consolidated sandstone available from any creek gravel bar. Watson Brake has similar groundstone artifacts and raw materials and is similar to Jaketown and Denton groundstone assemblages.

The John Forrest collection has an interesting assemblage of ground and pecked stone artifacts. Jaketown (Ford, Phillips, and Haag 1955), Cad Mound (Gibson 1968), Slate Site (Lehmann 1981), Denton Site (Connaway 1977), and Watson Brake (Johnson 2000) collections are more similar in terms of the ground and pecked stone assemblages than any other broad artifact category as demonstrated in Table 4.

Table 4: Ground and pecked stone artifact data.

	JohnForrest		WatsonBrake		Jaketown		Denton		Slate Site	
	Ct	%	Ct	%	Ct	%	Ct	%	Ct	%
Hammerstones	3	7.1%	13	20%	11	16.4%	5	10.9%	0	0
Abraders	21	50%	9	14%	3	4.5%	9	19.6%	0	0
Grinding stone	2	4.8%	42	64.6%	24	35.8%	25	54.3%	1	9.1%
Atlatl weights	15	35.7%	0	0	11	16.4%	7	15.2%	6	54.5%
Plummets	1	2.4%	1	1.5%	18	26.9	0	0	4	36.4%
Total	42	100	65	100%	67	100%	46	100%	11	100%

Conclusions

The John Forrest Site surface assemblage contains an interesting array of artifacts: stone beads, blade cores, polished bifaces, etc. At first glimpse, the John Forrest collection seems unique, however, with further inspection it becomes clear that other sites in the Lower Mississippi Valley have similar assemblages. At Watson Brake and Cad Mound assemblages are much smaller, but yield stone beads manufactured by the same

process and similar bifacial and core technologies as represented at John Forrest. Although Jaketown is contemporaneous with Poverty Point, the collection of stone tools mimics those found at John Forrest. The Slate Site actually has the same assemblage of artifacts as John Forrest, but was dated to Poverty Point because of an elaborate bead manufacture process, known only at Poverty Point. The Keenan Bead Cache is suggested to be either Middle or Late Archaic, but lacks any archaeological context to support this. Large portions of the Keenan Bead Cache ornaments are the same as the chipped and greenstone beads of John Forrest.

The study of these artifacts reveals a specific type of technology used in making beads and tools during the Middle Archaic. It is suggested that the John Forrest Site assemblage represents the work of craft specialists. While Johnson (2000) saw no reason to argue for craft specialists based on the Watson Brake assemblage, the larger and more diverse John Forrest assemblage suggests that possibility. Further, the requisite time assumed to be required to manufacture a chert bead is not in accord with lifeways commonly attributed to Middle and Late Archaic hunter-gatherers. Critical experimental work must be undertaken to understand the technology and time involved in chert and greenstone bead production.

The significance lies in considering hunter-gatherers as constrained by specific technological and functional in traditional reconstructions of Middle and Late Archaic life and the presence of artifacts, such as chert beads, that do not fit these reconstructions. Is it possible that a less traditional model of hunter-gatherers must be made for the Lower Mississippi Valley during the Middle Archaic? The data at John Forrest, Watson Brake, Cad Mound, Slate Site, Denton, and Jaketown demand a new interpretation of hunter-

gatherer cultures in the Southeast during the Middle and Late Archaic.

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