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Chipped Stone Artifacts from the Mackey Site, A Large Black Midden Mound in the Fourche Maline Valley

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Chipped Stone Artifacts from the Mackey Site, A Large Black Midden Mound in the Fourche Maline Valley

A THESIS APPROVED FOR THE

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Introduction

Archaeology of the Fourche Maline Area

In 1939 and 1940, the University of Oklahoma sponsored a number of archaeological excavations by Works Progress Administration (W.P.A.) relief workers in LeFlore County in eastern Oklahoma. One of the most productive areas was along the Fourche Maline Creek and Poteau River convergence at the northern edge of the Ouachita Mountains (Figure 1). This area was preliminarily surveyed in anticipation of the construction of Wister Reservoir. Prehistoric cultural material was abundant, and excavations were conducted at many sites in order to preserve cultural material due to be inundated by construction of Lake Wister.

The artifacts and burials recovered from the W.P.A. excavations were also cleaned, sorted and catalogued by W.P.A. relief workers. The material was deposited at the Stovall Museum (now the Oklahoma Museum of Natural History) at the University of Oklahoma in Norman, Oklahoma. Quarterly reports were prepared and submitted to the W.P.A. offices by field directors Phil J. Newkumet and Lynn E. Howard. These reports now reside at the Smithsonian

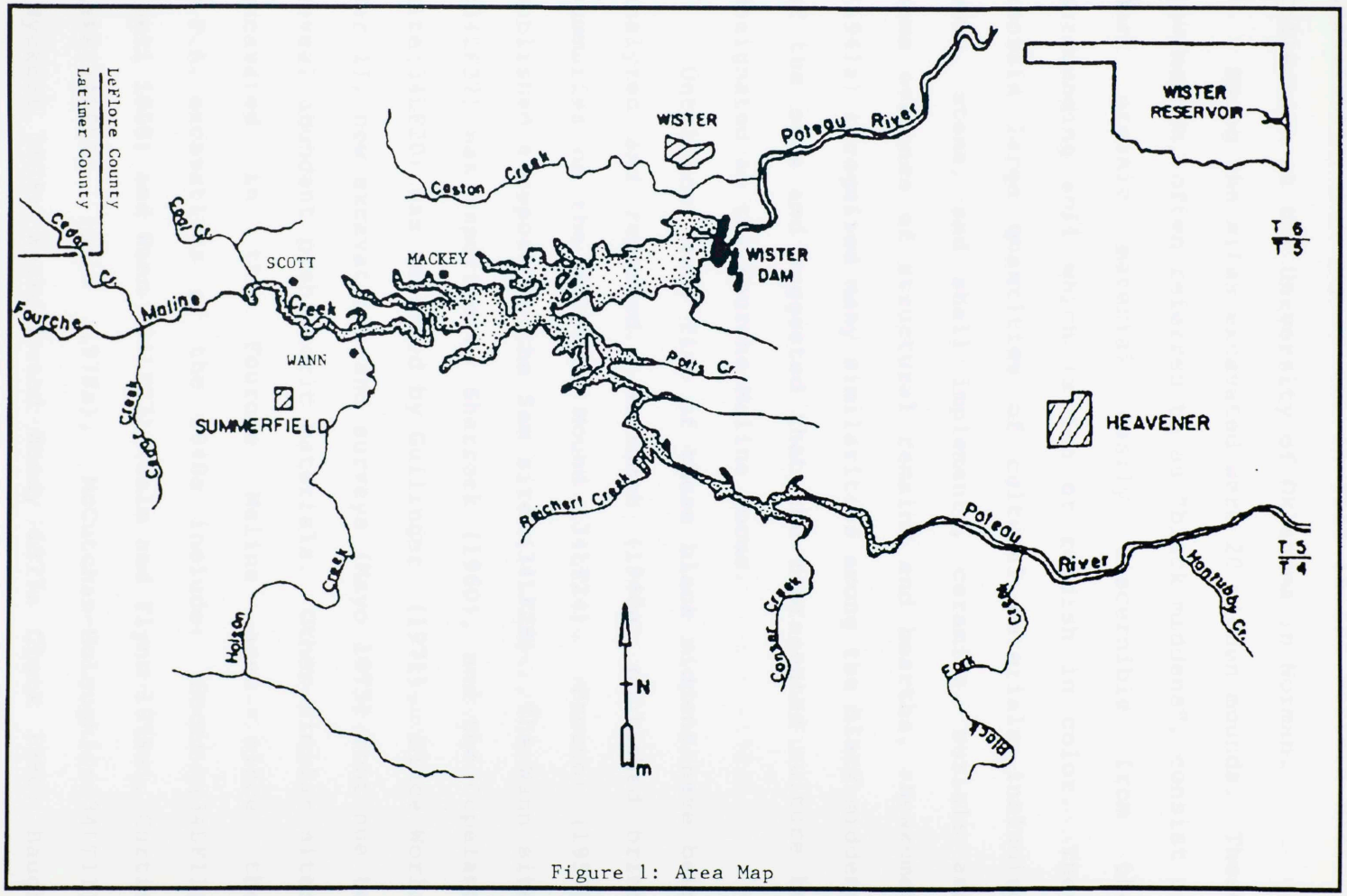


Figure 1: Area Map

Institution, but copies are on file in the Western History Collection at the University of Oklahoma in Norman.

Among the sites excavated were 20 midden mounds. These low mounds, often referred to as "black middens", consist of dark organic material easily discernible from the surrounding soil which is tan or reddish in color. They contain large quantities of cultural materials including bone, stone, and shell implements, ceramics, burials and some evidence of structural remains and hearths. Newkumet (1941a) recognized many similarities among the black middens of the area and suggested that the represented culture be designated as the Fourche Maline focus.

Until now, only five of these black middens have been analyzed and reported. Newkumet (1940a) published brief summaries on the Williams Mound (34LF24). Proctor (1957) published a report on the Sam site (34LF28). The Wann site (34LF27) was reported by Sharrock (1960), and the Copeland site(34LF20) was reported by Guilinger (1971). Since World War II, new excavations and surveys (Mayo 1975) continue to reveal abundant prehistoric materials. Other similar sites excavated in the Fourche Maline area since the W.P.A. excavations of the 1940s include: Scott (34LF11) (Bell 1953) and Wann (34LF27) (Galm and Flynn 1978a), Curtis Lake(34LF5A) (Galm 1978a), McCutchan-McLaughlin(34LT11) (Wyckoff 1976; Wyckoff and Woody 1977; Clark 1980; Baugh

1982) and Bug Hill (34PU116) (Vehik 1982; Altschul 1983). Physical anthropological studies of human skeletal remains have been done at Wann and Sam (McWilliams 1970), McCutchan-McLaughlin (Powell and Rogers 1980) and Mackey (Burns 1994).

The current project was initiated in 1990 to analyze artifacts and burials from one of the largest midden mounds, the Mackey site (34LF29). Newkumet (1940b) first reports the excavation of the site in the third quarterly report of 1940. He also mentions the site in the first and second quarterly reports of 1941 (Newkumet 1941b, 1941a). It is in the last of these three reports that Newkumet (1941a) first introduces the term Fourche Maline focus, to identify the culture represented by the black middens excavated along Fourche Maline Creek. The black midden mounds contain stratified cultural deposits that are largely similar with respect to formation processes, artifact types, burial configurations, faunal remains and other organic matter. These assemblages also serve to distinguish the sites in this area as being somewhat unique from the surrounding areas. Newkumet (1941b) recognizes artifact similarities to Woodland and Mississippian cultures in addition to a significant pre-ceramic tradition similar to the eastern Archaic.

The concept of the Fourche Maline focus has been a

topic of debate. Spatial boundaries have been extended beyond Fourche Maline Creek to encompass much of eastern Oklahoma, part of western Arkansas, northeastern Texas, and northern Louisiana. The Fourche Maline focus spans a very long period of time from the Archaic through late prehistoric. Bell (1980) and Galm (1981, 1984) suggest the concept of a Fourche Maline focus be abandoned, and that Wister phase (Archaic) and Fourche Maline phase (Woodland) be used instead.

Galm's (1981, 1984) analysis is probably the most thorough synthesis of the available data from the Wister Valley. His model of the cultural chronology is presented in Figure 2. Galm (1981) calls for continued refinement of the cultural sequences of the area. In particular, he points out that the Wister phase spans a very long period of time (1500 B.C. to 300 B.C.) and that further subdivision of this phase may be necessary. In addition, the early Fourche Maline phase seems to be poorly represented in the Wister Valley and there appears to be a break in the cultural sequence between A.D. 1 and A.D. 600.

Similarly, Schambach contends that "chronology is one of the weakest areas of Fourche Maline studies in southwest Arkansas" (1982). His time range for the Fourche Maline

TIME	PHASES	PERIODS	STAGES
1700	HISTORIC	CHOCTAW	INDIAN TERRITORY
	FORT COFFEE	COALESCENT	ETHNOGRAPHIC
1400	SPIRO	HABIÚKUT	MISSISSIPPIAN
1200	HARLAN		
1000	EVANS		
700	FOURCHE MALINE	ARKANSAS RIVER	SOUTHERN WOODLAND
A.D. / B.C. 300	WISTER	LATE ARCHAIC	ARCHAIC
1500	?	MIDDLE ARCHAIC	
6000	?	EARLY ARCHAIC	
8000	?	PALEO-INDIAN	EARLY FORAGING
12,000			

Figure 2: Cultural Sequence of the Poteau Basin (Galm 1981)

culture in southwestern Arkansas is between 800 B.C. to A.D. 900. This roughly coincides with the Wister and Fourche Maline phases proposed in Galm's model.

The Mackey site is of particular interest to research in the Wister Valley and eastern Oklahoma. It is one of, if not the, largest of the black middens excavated along Fourche Maline Creek. Newkumet (1940b) notes that the depth and extent of deposits at Mackey indicated a very long period of occupation. Proctor (1957) and Sharrock (1960) refer to Newkumet's reports to compare the Mackey site with the Sam and Wann sites, respectively. Galm (1978b) reports additional testing conducted at Mackey in 1978 and suggests that Mackey is one of four "somewhat unique" sites in the valley. He also lists Mackey as the only midden in the Wister Valley, other than the Scott site, that contains deposits from the Middle Archaic period (Galm 1981).

Research Problem

The primary purpose of this study is to describe the chipped stone tools in the black midden of the Mackey site. A major objective of this thesis is the identification and refinement of the cultural sequences represented at Mackey in relation to the cultural complexes of the area. The

depth of the site and recognition of a middle Archaic cultural component (Galm 1984) indicate that Mackey is a key site for testing and refining the previously defined cultural sequence for the Poteau Basin. This objective will supplement the current knowledge of the Fourche Maline area and increase the understanding of prehistoric occupations of eastern Oklahoma.

Artifact form and distribution are basic levels of analysis in research on technological organization (Nelson 1991). Artifact form is defined through resolving questions of raw material selection and manufacturing processes. Distribution is defined in the identification of temporal and spatial relationships of the artifact forms. These definitions provide the basic data from which questions of social, economic and technological strategies can be addressed (Nelson 1991). Assemblages of lithic tools, and particularly projectile points, have long been utilized by archaeologists as cultural and temporal diagnostic indicators. Lithic tools provide the oldest known evidence of human culture. Lithic technology is a universal human tradition that spans hundreds of thousands of years. Because of their durability, much of our knowledge of ancient peoples is based on the analysis of their tools. Tool forms enable the identification of spatial boundaries or ranges of related peoples. Changes in tool forms reflect

the technological and cultural changes of the inhabitants of an area. (Cotterell and Kamminga 1987; Cahan et. al. 1979)

Artifact assemblages from the middens are dominated by chipped stone tools. Points are the primary chipped stone category and contracting stem points are the prevalent type. Contracting stem points are found in very early assemblages and continue through a long period of occupation (Baerreis et. al. 1958; Bell 1958; Galm and Flynn 1978b). This contracting stem point tradition/technology is represented across a wide geographical area, including northwestern Louisiana (Webb 1977) and western Arkansas (Stahle 1986a; Dickson 1991) as well as most of eastern Oklahoma (Baerreis et. al. 1958; Bell 1958; Galm 1981). In fact, contracting stem points, such as the Gary type (Bell 1958), are one of the important cultural diagnostic markers of Fourche Maline cultures (Bell 1980).

There is a very wide range of variability among contracting stem point attributes, yet they are commonly grouped together as one type. A few studies of variation among contracting stem points have been conducted. Proctor (1957) identifies and describes seven sub-types of Gary points and three sub-types of Wells points among the contracting stem points from the Sam site. In an analysis of contracting stem points from 10 sites in northeastern Oklahoma, Baerreis et. al. (1958) identify three distinct

sub-types of Gary points and three sub-types of Langtry points. Wyckoff (1967) describes 10 types of contracting stem points at the E. Johnson site, which include Desmuke, Langtry, and six Gary types. Schambach (1982) also identifies three distinct sub-types of Gary points from southwest Arkansas. Schambach (1982) also contends that his sub-type classification scheme is one "whose temporal significance has been confirmed and which can be identified and sorted consistently." Overall, there has been little consistency in classification of the various forms of contracting stems and functional analysis of contracting stems are very limited (Ahler 1971).

The abundance of contracting stem points and tools indicates they were a very important component of the technological strategies and cultural traditions of the area. A refinement of our knowledge of the contracting stem technology is a key component in understanding the social and economic strategies of their makers. Lithic studies in the Fourche Maline area should include careful examination of the contracting stem tools and attempt to explain their abundance and variations. One of the objectives of this analysis is to examine and describe variations in contracting stem form and distribution to provide a basis for understanding the technological, social and economic strategies they represent.

The identification of raw material sources and their distribution in the archaeological record are important components of lithic analysis. Lithic raw material was, for prehistoric peoples, a necessary requirement for efficient subsistence activities. Lithic procurement and utilization strategies were an integral part of everyday life. A reliable source of high quality lithic material was undoubtedly an important consideration in decisions regarding settlement and mobility. Lithic raw materials were also a component of trade relations. One aspect of the lithic analyses of the Fourche Maline culture that could be improved upon is the evaluation of raw material selection. Although material sources have been identified (Galm 1978a, Banks 1990), the significance of variations in lithic material procurement and use is somewhat understated. The lithic raw material sources represented at the Mackey site will be identified and evaluated on the basis of geographic origin and change through time.

In order to contribute to the understanding and refinement of the cultural sequences of the Wister Lake area, raw materials and artifact forms must be identified. Stratigraphic sequences and changes in these parameters will be compared with other sites in the area. This thesis should provide a relevant and long-overdue analysis of one of the most important sites in eastern Oklahoma. The

analysis of chipped stone artifacts from the Mackey site will supplement previous studies of the area and test some of the models designed to describe the cultural sequences there. Although this analysis is confined to chipped stone artifacts, limited references to other artifact categories will be included to enhance interpretation.

A secondary objective of this analysis is the evaluation of the research potential of the material excavated by the W.P.A. This evaluation is a complementary and necessary process to the research objectives of this study. Analysis of archaeological materials is inevitably biased by the procedures of recovery. Archaeological survey and excavation procedures have changed a great deal in the past 50 years to improve the quality and quantity of data that are recovered. W.P.A. excavation procedures were, by today's standards, crude. As a result, invaluable information has been lost forever. This is not to say that 50 years in the future, today's excavations will not be considered crude as well. The important point is that these materials were saved from the floodwaters of Lake Wister because their cultural value was recognized and appreciated. It is the challenge for today's archaeologists using modern tools, techniques, and theories to maximize information that these collections have to offer.

One of the most important problems with the Mackey

excavation was the absence of screening fill dirt, which is a standard practice today. No debitage or small flakes were recovered. In fact, the smallest lithic artifact in the collection is an arrow point, 1.5 cm long. The absence of debitage severely limits the information that could be obtained about site activities with respect to lithic tool manufacturing and maintenance.

Another major problem is the excavation unit size. Five by five by one foot units identify the context of most recovered artifacts. These units are almost five times as large as the 1 x 1 m x 10 cm units which are commonly used today. The result of using such large units is that the accuracy of the context from which artifacts were recovered is reduced by about 500%. The accuracy of any stratigraphic sequence postulated for this site is reduced by about 300%.

Another potentially significant problem with the W.P.A. procedures is the speculation that W.P.A. workers did not properly collect all of the artifacts that they found. Hearsay evidence would indicate that workers kept some of the artifacts for souvenirs. Speculation also exists that broken, or unidentifiable artifacts were discarded. If these speculations are true, then an unknown sampling bias is introduced into the collection. Conclusions based on frequency statistics must be accepted very carefully, if, at all. One of the objectives of this analysis will be to test

these speculations by comparing artifact frequencies with those produced from more recent, and more controlled, excavations in this area.

When this project is completed, there will still be collections from 16 sites that were excavated by the W.P.A. along Fourche Maline Creek that have never been systematically studied. The excavation biases must be identified and, if possible, quantified, in order to maximize the research potential of these collections.

Procedure of Analysis

The Mackey midden is a very large site, and it is suspected that many of the original artifacts were not collected. In order to maximize the site's research potential and minimize further sampling bias, the procedure of analysis should be as systematic as possible. The effectiveness of the analysis is dependent upon the validity of the data and the solidity of the logic applied to the data. The validity of the data is based on the extent to which the sampling bias is reduced. Formal similarities and differences should be recorded in enough detail to meet the objectives of the analysis. Classification is not an important focus of this study and is secondary to basic

descriptions of form. Therefore, artifacts are grouped, rather than classified, based on subjective observation of attribute clustering and are separated on the basis of minute differences. These groups and their descriptions provide the basic units of data used in this analysis.

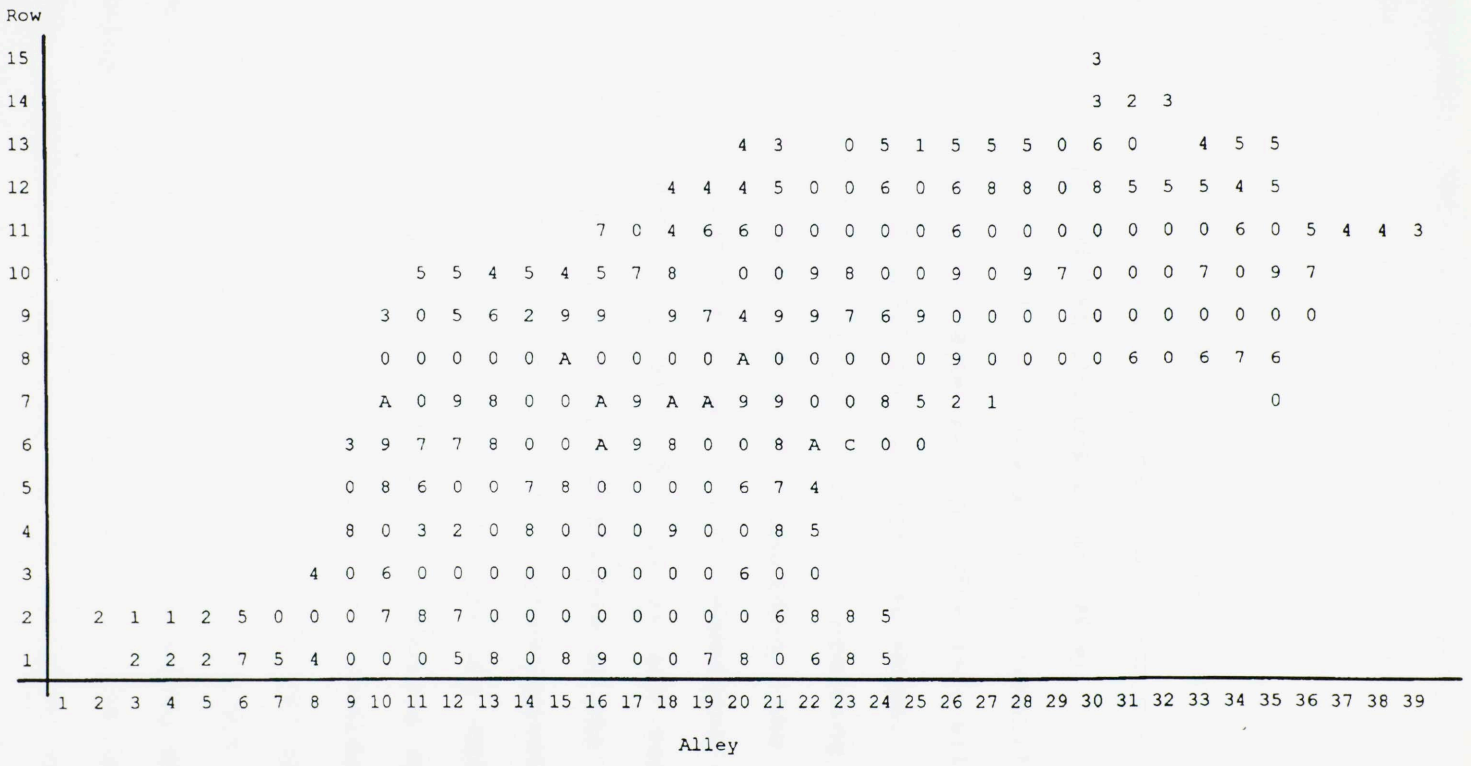
To facilitate the objective analysis of the formal variations among artifacts, a computer database was created. Data recorded for each artifact includes catalog number, provenience (row, alley, level), raw material and tool form (see appendix A). These variables are encoded in the record for each artifact. These codes can then be evaluated statistically and in a three dimensional framework. Changes in attributes through time and across the site should become apparent from careful manipulation and interpretation of these observations.

The four primary phases of the study are inventory, description, analysis and interpretation. The artifacts had not been inventoried prior to this study. The inventory process involved cataloging of the individual artifacts and the creation of a computer database with a detailed record for each artifact. When the Mackey site artifacts were retrieved from storage, they were in paper sacks, with all artifacts from a single square and level bagged together by type, such as chipped stone or bone. Each bag was labeled with site, provenience, date of collection, and artifact

category information. In addition, sack numbers had been assigned and written on the sacks. Each sack contained one to any number of artifacts which were not individually labeled or cataloged. In order to efficiently handle and reference the artifacts individually, new catalog numbers were assigned to each square and level. Each artifact was labeled with this new number. A suffix number was also used in this study to identify each specific artifact. The new catalog numbers, along with the sack information were entered into a computer database. The provenience of an artifact could then be determined by referring to the computer database and the sacks could be stored away.

The re-cataloging process began with row one. It was soon determined that the total number of chipped stone artifacts would be inappropriate for the scope of this thesis and that a sample subset should be selected for study. The decision was made to select for analysis only artifacts from squares that did not contain burials. A preliminary computerized inventory completed by Rain Vehik enabled the early identification and plotting of burial and nonburial squares. Figure 3 illustrates the locations of burials across the site. Of the 263 squares, 117 contain at least one burial. Selecting only artifacts from nonburial squares reduces the mixing effect of interments and improves the consistency of the stratigraphic sequences that can be

Figure 3: Mackey Site Grid



The numbers in the grid represent the deepest level of each square. 0=Burial square, letter A=level 10, B=level 11, C=level 12.

established. This can only be proven, however, by analysis of the burial squares and comparison of results between the burial squares and nonburial squares. The potential benefit of this sampling criteria is sufficient to justify its application. From this point, cataloging of chipped stone artifacts from nonburial squares was completed, and the initial database information was established.

The description process involves the identification of relevant physical attributes of the individual artifacts and recording this information in the database. Two main problems with this process are: 1) deciding what are "relevant" attributes, and 2) recording the attribute descriptions in a manner that is both expedient and useful in the interpretation phase. Attributes are selected for description to serve the stated objectives of the research. In order to address some of the chronological problems encountered by other studies in the Fourche Maline area, attributes comparable to those used in previous studies are selected. This is especially important considering that absolute dating techniques are not a viable option for this site. Relative dating of diagnostic artifact forms is probably the best we can hope for in addressing problems of chronology. Therefore, at every point in the descriptive process, comparisons are made with artifact forms from nearby sites, and descriptions of similarities and

differences are recorded as relevant.

The first step in the process is to sort artifacts by material type, identify and describe the different raw materials as well as possible and add the material types to the database. Next, the artifacts are resorted based on gross characteristics of shape. At this point, general tool types could be defined. However, these categories require further subdivision in order to efficiently record as much detail as possible. At some point, however, the subdivision has to cease to prevent the differences among artifacts from overshadowing their similarities. In some cases, the differences among artifacts in the lowest level of grouping are so subtle that questions of craftsmanship could be entertained. These smallest groups are assigned codes which are then entered into the database record for each artifact.

Groups of material types and groups of tool forms are recombined based on less specific criteria to form larger "generic" higher-level categories. The smallest and lowest level categories are referred to as 'types'. The larger, more general categories will be referred to as 'groups'. Statistical analysis and three dimensional modeling is conducted at both levels to ensure a balance in emphasis between similarities and differences. Analysis of lower level types reflects subtle differences, whereas

consideration of the higher level groups emphasizes gross similarities.

The analysis phase involves sorting and summarizing the data by attribute and provenience. Frequencies and relationships are established. From these observations, patterns of stability and change can be discovered.

The interpretive phase of the study includes the identification of stratigraphic sequences and changes in artifact characteristics through time. Diagnostic artifacts are identified as well as possible and used to establish relative dates for various stratigraphic components by comparing with other sites in the area. Significant similarities and differences may lead to suggestions about site occupation and function.

Chapter 2

Descriptions

Description of the Mackey Site

The Mackey site is on the northern bank of an intermittent stream which flows southeast a quarter-mile to join Fourche Maline Creek, which joins Poteau River 1.5 miles further east (Newkumet 1940b). South of the site, between the small stream and Fourche Maline Creek, is a low flat area that was subject to flooding. The north bank of the stream slopes up to a higher, rolling area where the midden forms the southern lower edge.

The midden was excavated in 1940 under the direction of Phil J. Newkumet. A grid of 5 x 5 foot squares was laid out over the midden. The grid originates at the southwest corner, which is designated as row 0, alley 0. South to north coordinates are rows 1 through 15. West to east coordinates are alleys 1 through 39 (Figure 3, page 17). The squares were excavated in one foot levels starting with the most southern row of squares running east-west. After several layers of the row were removed, excavation began in the adjacent row of squares to the north (Figure 4). This

Figure 4: View of 1940 Excavation of Mackey site from the west end of row 10.

process was repeated until the midden was, more or less, completely excavated. The excavations extend to a depth of up to 10 feet where the base of the midden was delimited by underlying rock and clay. The fill dirt was not screened.

North of the midden about 50 yards, a house site was also excavated. A post hole pattern was uncovered at about 1.5 feet below the surface. The pattern is a square, 25 feet wide, with four large center posts (Galm 1978b: 236-237). Charcoal from one of the post holes yielded a radiocarbon date of A.D. 1490 (Bell 1980). Another

potential house site was located nearby during the survey but it was not excavated.

Materials recovered from the midden include stone, bone, and shell implements, potsherds, unmodified animal bones and mussel shells, 160 human burials, and one dog burial. The material was sorted and bagged according to these types. It was then put into storage at the Stovall Museum in Norman, Oklahoma.

Lithic Raw Material Descriptions

Accurate identification of lithic raw materials is very complicated. Although microscopic and x-ray diffraction techniques are being developed, visual inspection and comparison are the standard methods used to process large quantities of materials. The process requires that the investigator be familiar with the available materials in the region. Heating of the lithic material, whether intentional or accidental, and weathering alter the appearance of many material types. Additionally, as in the case of the Mackey site materials, a calcium soil deposit adheres to the surfaces of the artifacts and obscures the colors and textures upon which the identifications are based. Identification of materials is based on color, texture,

translucence, glossiness, surface fractures and inclusions. It is an extremely subjective process and a margin of error is always present.

The identification of lithic raw materials in this study is aided by comparison with sample collections at the Oklahoma Archaeological Survey lab and through consultation with Survey staff members and others familiar with eastern Oklahoma materials.

The material types were sorted and resorted. This sorting resulted in 29 distinctive material types. Although these types could be useful in a detailed analysis, it is known that many material types occur as cobbles in the rivers and streams of the area, a fact that reduces the importance of their exact geological origin. The original assortment of 29 types was thus collapsed into 12 general groups, and these were further collapsed into five major groups. These five groups enabled a meaningful evaluation of lithic procurement. In general, these five groups correspond with the primary groups identified and described by Galm (1978a).

Quartzitic sandstone, or quartzite, is the predominate group. Its granular texture ranges from very fine to coarse. Colors range from greenish-gray to blue-gray to black. One of the identifiable sub-varieties of the quartzite group is a fine-grained, dark, banded material.

This material outcrops in the Jackfork and Stanley groups of the Winding Stair Range of the Ouachita Mountains (Banks 1990).

Quartzite is a very hard, resilient material and although it is difficult to work, it is used in a variety of forms. Because of its hardness, tools of quartzite are durable. Quartzite slabs and cobbles are abundant in streambeds and along the shores of Wister Lake. Quartzite was a very important resource for prehistoric inhabitants of the area.

Another locally available material is defined by Galm (1978b) and Lintz (1979) as simply Type A chert. This generic terminology was adopted because it includes a number of previously defined materials available as outcrops in the John's Valley shale of the Ouachitas (Banks 1990) and as stream cobbles, but which are nearly impossible to distinguish from one another. These are very fine, cryptocrystalline silica materials, with highly fractured, glassy surfaces. Their colors range from blue-gray and tan to nearly black. Many of the artifacts of this material contain brown sandy sections. Most are opaque to slightly translucent at the edges. Many of the artifacts retain small fragments of cortex, which has a weathered, tan, cobble-like appearance.

Type B chert is also locally available as cobbles in

nearby streambeds. This material is consistently black, very dense, and opaque. The surfaces are smooth with no glassy fractures. Galm (1978b) has defined Type B chert as Bigfork chert, a well-known material that originates in the Ouachita Mountains. The samples in this collection, however, may be of Woodford chert, which outcrops along the northern ridge of the Ouachitas and is very similar to Bigfork (Banks 1990).

At least seven other material types originating in the Ouachitas are identified. These are combined together to form the Miscellaneous group. Materials identified in this group include hematite, argillite, sandstone, slate, siltstone, greystone and Arkansas novaculite. Hematite, argillite, slate and sandstone are represented by large artifacts, such as axes and hoes. Slate and siltstone are represented by only one artifact each. The greystone materials are identified by comparison with samples obtained from the Clayton Lake project, and are described by Lintz (1979). The Arkansas novaculite was possibly the most heavily quarried material in the Ouachita area (Baker 1974; Early and Limp 1982; Banks 1990). This material is translucent with highly fractured surfaces. Novaculite colors are white, tan and pink.

The fifth group includes a variety of materials which originate north of the Arkansas River in the Ozark Mountain

uplift. Among the materials identified are Boone, Reed Springs and Keokuk cherts. These materials are opaque. Boone, Reed Springs and other similar cherts are gray and tan with dark, sometimes black, specks, bands, spicules and splotches. These materials are dense with smooth, dull surfaces. Keokuk chert is basically white with weathered surfaces of tan and gray. In contrast with the Boone and Reed Springs varieties, the texture of Keokuk is often chalky and granular. The texture of some of the Keokuk artifacts is smooth and waxy, probably due to heating. Some of the Ozark material is pink, which is also due to heating (Banks 1990).

Tool Descriptions

The lithic artifacts were sorted into groups based on formal characteristics of shape and design. This procedure resulted in defining seven major categories: contracting stem points, parallel stem points, expanding stem points, axes and hoes, blade and tip fragments, flakes and miscellaneous bifaces. The design of the hafting area is of primary interest because it represents the stage of tool manufacture beyond flintknapping. The stemmed tool is a part of a more complex tool and is intended to be attached

in some manner to another part. The stem is designed to "fit" onto another part of the final product (Kelly 1988, Odell 1994, Nelson 1991). It is also designed to be attached using a particular hafting technique and binding material (Ahler 1971). Because of the manner in which a point is attached to the shaft of the complete tool, the stem area is somewhat more protected from major damage during use. This is in contrast to the blade, or working area, of the tool which is exposed and more subject to major damage and repair. If the blade of a point is damaged, even severely, it may be resharpened, reshaped and reused. However, if the stem is damaged more than slightly, it will no longer "fit" into the design scheme of the complex tool. Because the stem design represents a more complex stage of tool manufacture and because it is more stable throughout the use-life of the tool, the shape and size of the stem is considered to be much more critical than the blade, or working section, in the identification of a tradition of tool manufacture.

Points, or small stemmed tools, are divided into three primary categories based on the overall design of the hafting area. Many tools classified as points are probably used for purposes other than projectile points. Ahler's (1971) hypothesis that "within a specific sample of a single formal class, 'projectile point', there are multiple

functional classes of tools" is accepted here. The adjective, 'projectile', is dropped and the term, 'point', is adopted to refer to all artifacts with a point on one end and a hafting facility on the other. It is beyond the scope of this thesis to determine actual usage although some observations will be made about possible usage based on general attributes of specific tools. The three general point categories are defined as follows: parallel stem points have stems with parallel sides; expanding stem points have stems that expand or diverge toward the base; and contracting stem points have stems with sides that contract or converge toward the base.

Each major category of artifacts is assigned a three-character code representing its formal type. The first character of the tool type is a letter designating the major category: A = axe or hoe, B = biface, P = parallel stem point, C = contracting stem point, X = expanding stem point, T = blade or tip fragment, F = flake. The second two characters of the tool type is a 2-digit number representing the subgroup of the tool within the larger category.

Contracting stem Points

Contracting stem points were sorted primarily by formal characteristics of the stems and secondly by shoulder properties.

Type Description

C01 N = 19. Stems are slightly contracting; bases are straight; shoulders are pronounced, with barbs; blades are wider than stems (Figure 5,a-c).

Types C02 - C08 have rounded bases.

C02 N = 12. Bases are rounded; stems are very wide and short; blades are wider than stems (Figure 6,a-c).

C03 N = 9. Bases are rounded; barbs extend toward base; blades are wider than stems (Figure 6,d-e).

C04 N = 13. Bases are rounded; shoulders are perpendicular to long axis; blades are wider than stems (Figure 7,c-d).

C41 N = 17. Very similar to C04 except that barbs are not quite perpendicular; shoulder forms obtuse angle with long axis; blades are wider than stems (Figure 7,b,e).

C05 N = 12. Very similar to C41 except shoulders are less pronounced; blades are wider than stems (Figure 7,a,f).

C51 N = 10. Very similar to C05 except that angle cut to make shoulders barely deviates from angle of stem; blades are same width or narrower than stem (Figure 8,f).

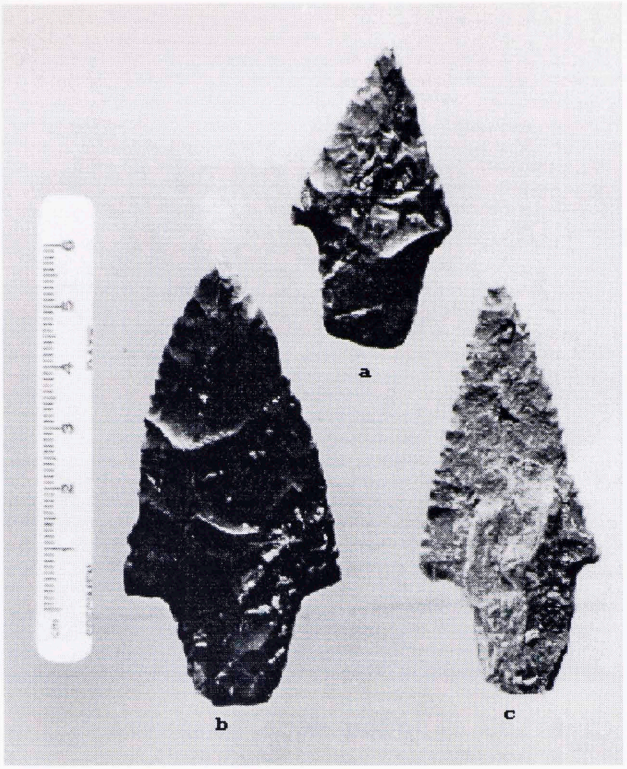


Figure 5: Contracting stem points. C01,a-c.

C06 N = 16. Very similar to C51 except shoulders are even less pronounced (Figure 8,a-c).

C07 N = 10. Very similar to C06 except shoulders are barely discernible; barbs nearly absent; stem as wide as blade (Figure 8,d-e).

C08 N = 20. Points are large or crudely made; shoulders are pronounced; bases are rounded (Figure 8,g-h).

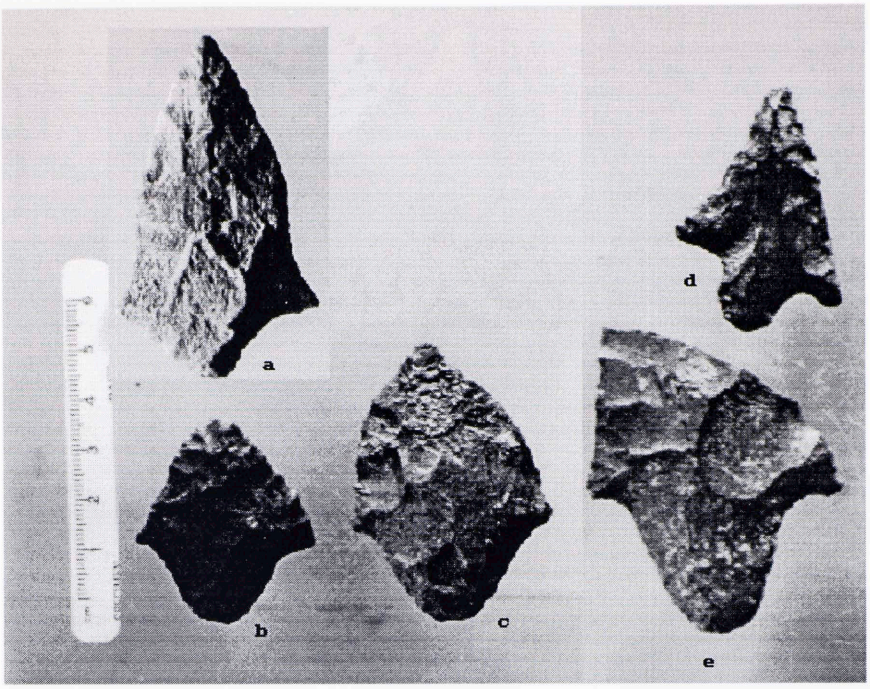


Figure 6. Contracting stem points. C02:a-c; C03:d-e.

The following types C09 - C12 have almost pointed but still slightly rounded bases:

C09 N = 6. Bases are narrow, nearly pointed; shoulders are slightly rounded and pronounced (Figure 9,a-b).

C10 N = 7. Bases are narrow, nearly pointed; shoulders are less pronounced than C09 (Figure 9,c-d).

C11 N = 3. Very similar to C10 except shoulders are even less pronounced (Figure 9,f).

C12 N = 4. Very similar to C11 except shoulders are barely discernible (Figure 9,e).

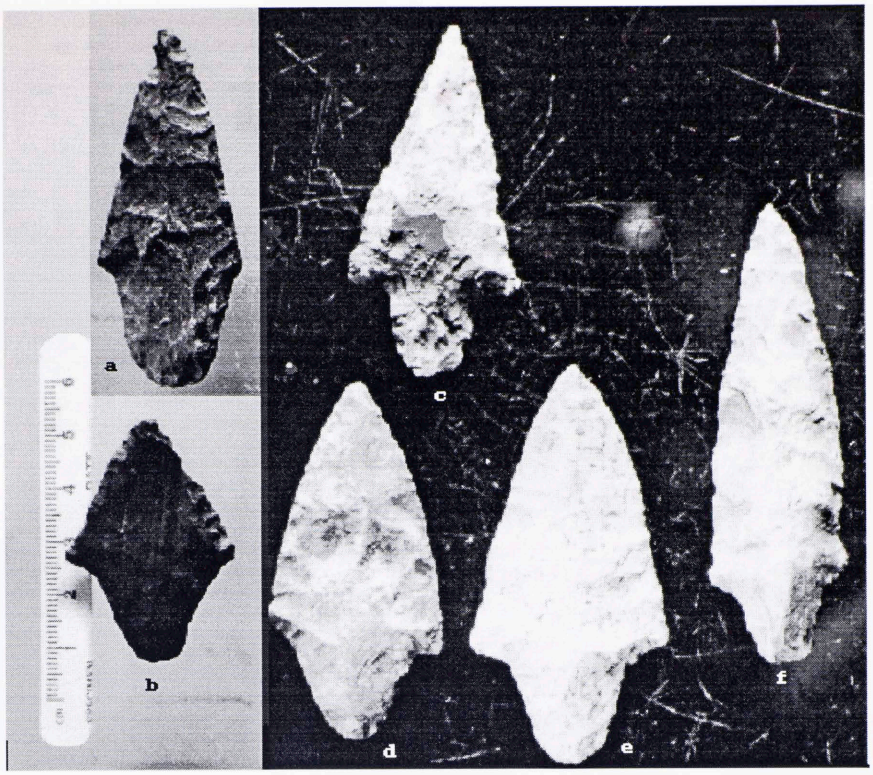


Figure 7: Contracting stem points. C04:c-d; C41:b,e; C05:a,f.

The following types C13 - 26 have pointed bases:

C13 N = 6. Similar to C12 except bases are more pointed; some shoulders not discernible (Figure 9,g-h).

C14 N = 10. Bases are pointed or very slightly rounded; shoulder angle nearly straight, i.e. little or no angle variation to form shoulder; stems are wide (Figure 9,j).

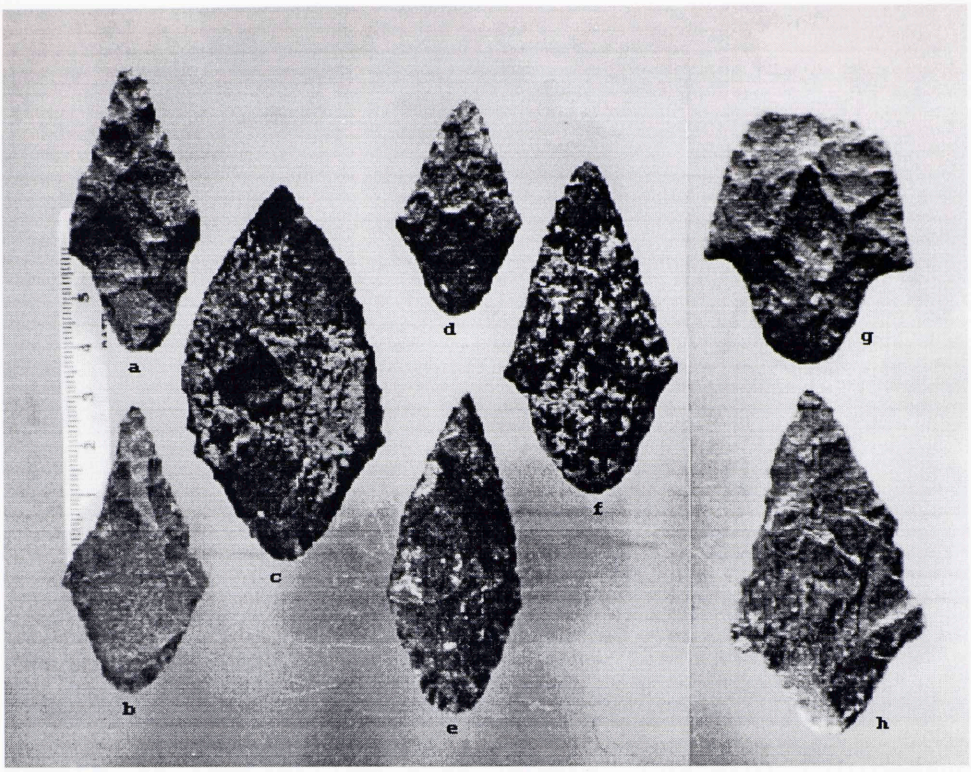


Figure 8: Contracting stem points. C51:f; C06:a-c; C07:d,e; C08:g-h.

C15 N = 2. Bases are pointed or slightly rounded; slight stem angle variation to form shoulder; stems slightly narrower than blades; blades long with respect to stem (Figure 9,i).

C16 N = 3. Bases are pointed; shoulder angle same as C15; stems shorter; end of base is broken off (Figure 10,a-b).

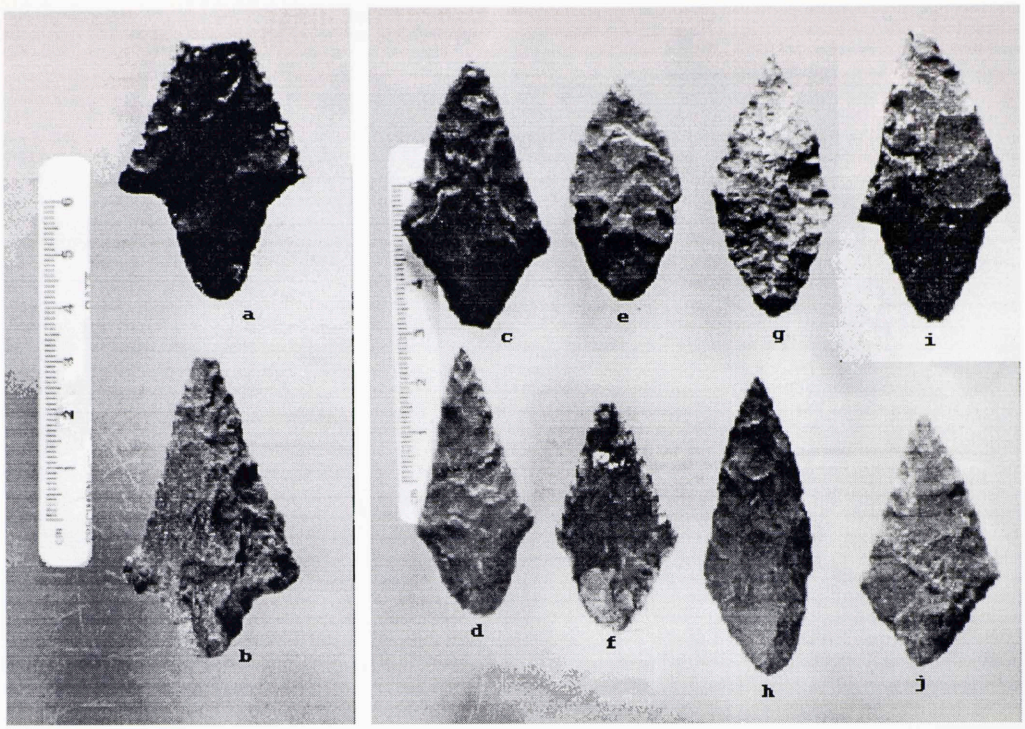


Figure 9: Contracting stem points. C09:a-b; C10:c-d; C11:f; C12:e; C13:g-h; C14:j; C15:i.

C17 N = 6. Bases are pointed; shoulder angle same as C15; stems narrower but almost as long as blades (Figure 10,c-d).

C18 N = 6. Bases not quite as pointed; stems and blades about the same length and width; shoulder angle nearly perpendicular to axis with pointed barbs (Figure 10,e-f).

C19 N = 11. Very similar to C18 except blades are longer, about twice as long as stems (Figure 10,g-h).

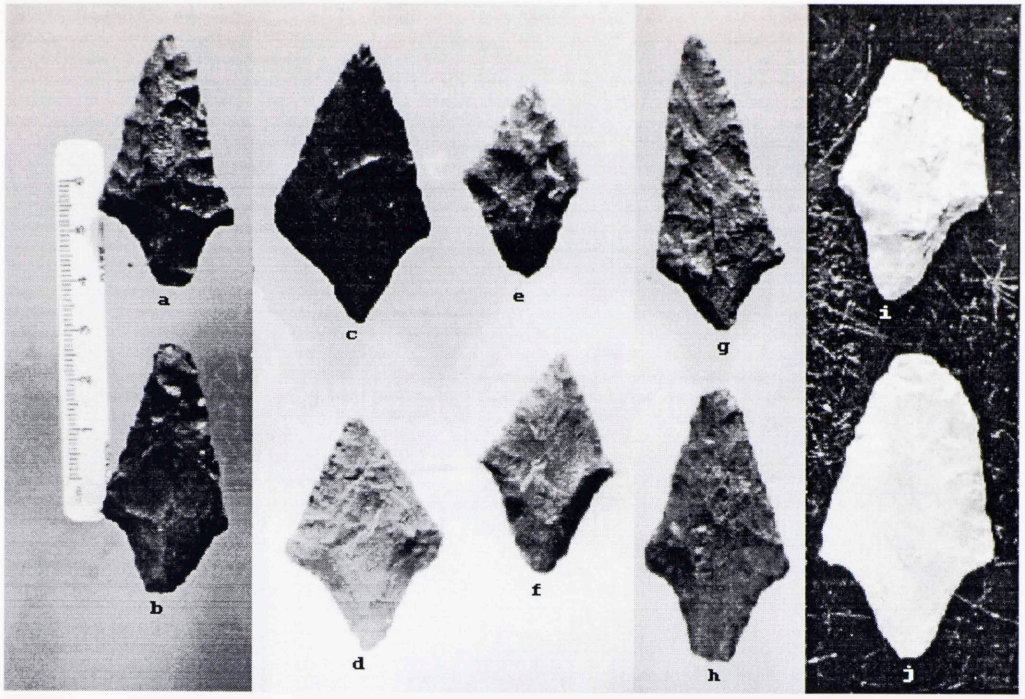


Figure 10: Contracting stem points. C16:a-b; C17:c-d; C18:e-f; C19:g-h; C20:i-j.

C20 N = 2. Bases nearly pointed or slightly rounded; stems thin and well shaped; blade edges are straight to convex; blade twice as long as stem (Figure 10,i-j).

C21 N = 7. Bases pointed or nearly pointed; workmanship crude, asymmetric shoulders; stem/shoulder angle is gradual curve with exaggerated, very wide shoulders (Figure 11,a-b).

C22 N = 21. Bases are pointed; base/shoulder angle almost perpendicular; base much narrower than blade which is two or three times as long as stem (Figure 11,c-e).

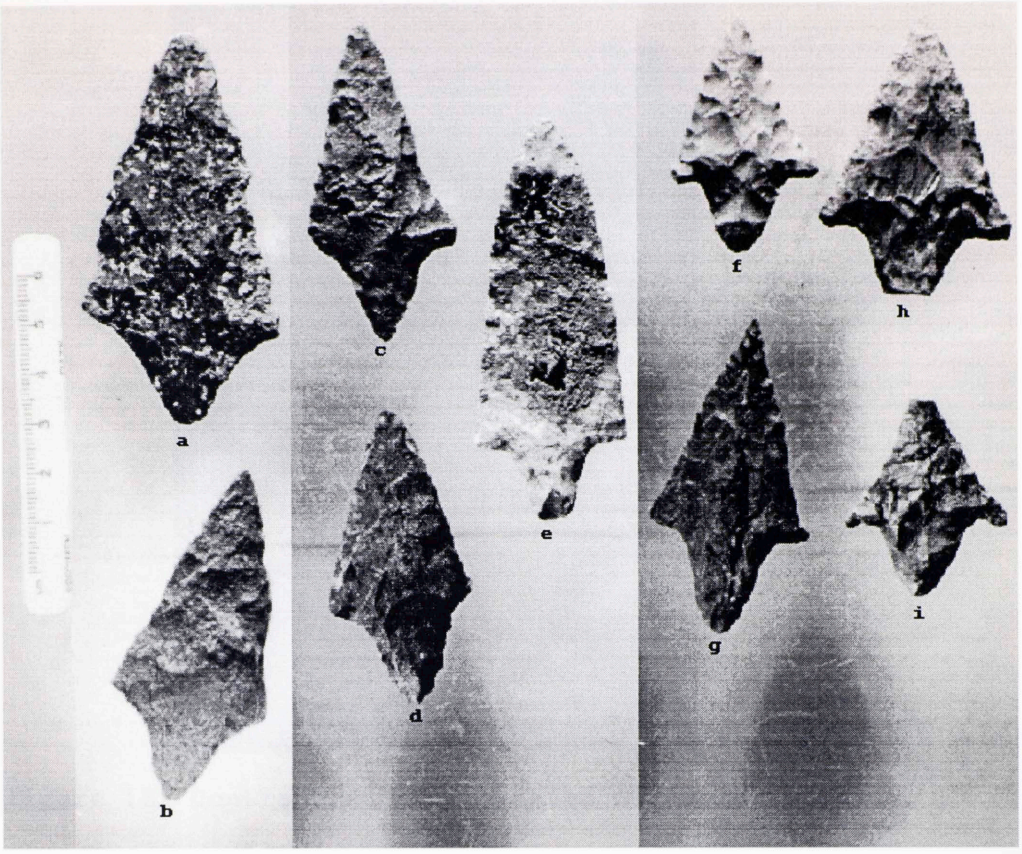


Figure 11: Contracting stem points. C21:a-b; C22:c-e; C23:f-g; C24:h-i.

C23 N = 15. Very similar to C22 except base/shoulder angle is abrupt and in some cases perpendicular; shoulders are wider, more exaggerated than C22 (Figure 11,f-g).

C24 N = 5. Stems are narrower and shorter than blades; shoulder/barb points toward baseline; base/shoulder angle is acute (Figure 11,h-i).

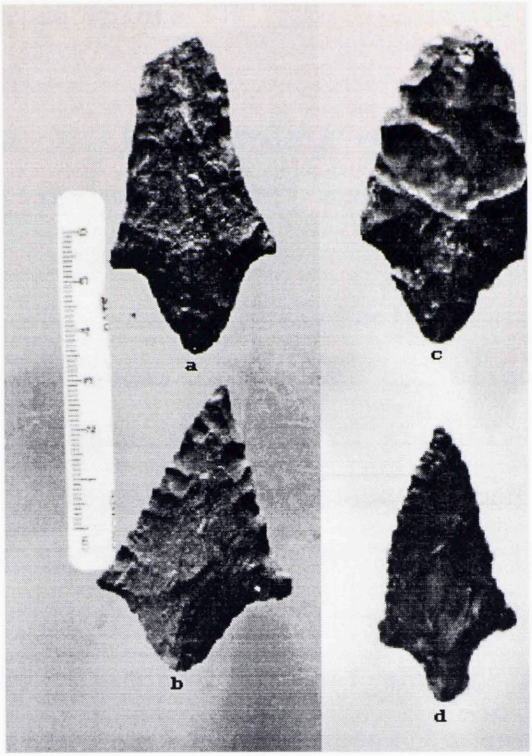


Figure 12: Contracting stem points. C25:a-b; C26:c-d.

C25 N = 4. Stems are nearly as wide as blades; shoulder is perpendicular to stem and less barbed than C24; base/shoulder angle is obtuse (Figure 12,a-b).

C26 N = 10. Rough, thick points; stems are very short and narrower than blades; blades edges are convex (Figure 12,c-d).

C N = 110. Contracting-stem points with bases so badly damaged that they could not be subdivided with respect to stem attributes.

Parallel Stem Points

The parallel stem points were subdivided into 16 groups which are labeled P01 - P11 and P13 - P17.

P01 N = 15. Large spear points with long, lanceolate blades; edges straight to slightly convex; stems square; bases straight to slightly convex; blade edges finely serrated; shoulders barbed to barely defined (probably due to retouch) (Figure 13,c-e).

P02 N = 6. Large spear points wider and shorter than P01; blades triangular to leaf shape; large irregular flake scars; shoulders pronounced to barbed; bases straight to slightly convex; stems irregular (Figure 13,f-g).

P03 N = 2. Short thick dart or well-worn spear points; bases rectangular; shoulders rounded to slightly barbed; blades are short and triangular and edges straight but very battered; one face of stem has a large bevel flake removed from base on both specimens; significant wear and retouch on all edges (Figure 13,h-i).

P04 N = 4. Dart points with stems that are narrow and parallel to slightly expanding; bases are straight or very slightly convex or concave; stems have long narrow flakes removed from base toward blade; blade is

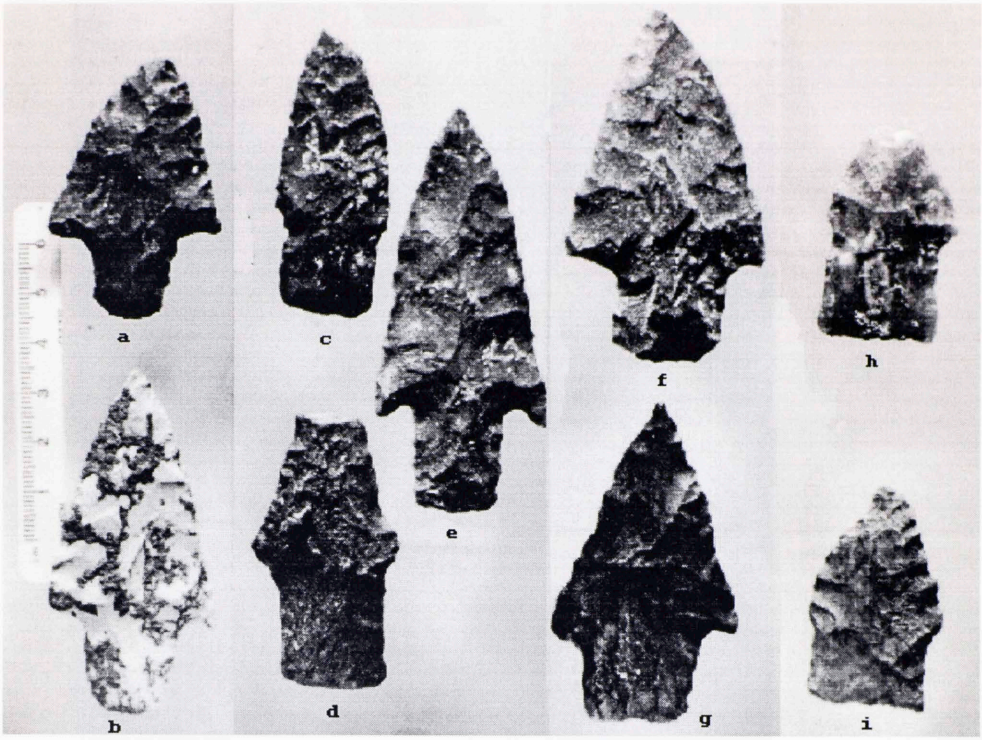


Figure 13: Parallel stem points. P05:a-b; P01:c-e; P02:f-g; P03:h-i.

triangular with straight edges; shoulders are pronounced and slightly barbed (Figure 14,d-e).

P05 N = 6. Stems are parallel or slightly contracting; some specimens have rounded corners; bases are convex and rounded; shoulders are pronounced to barbed and rounded; blades are convex (Figure 13,a-b).

P06 N = 11. Small to medium points with slightly contracting stems that are almost 1/2 the total length; bases are straight; shoulders are rounded to slightly

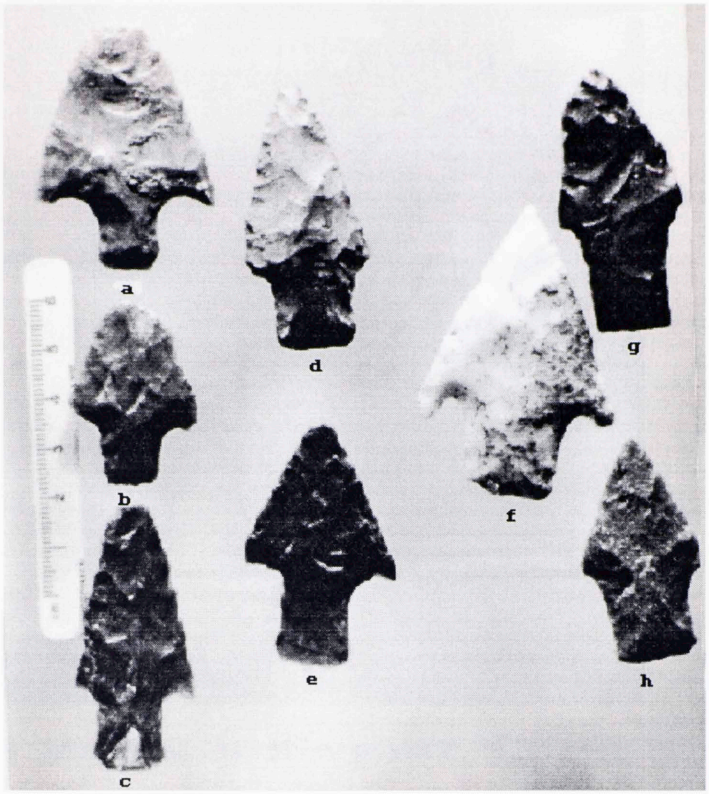


Figure 14: Parallel stem points. P07:a-c; P04:d-e; P06:f-h.

barbed; blades are triangular with edges straight to slightly convex (Figure 14,f-h).

P07 N = 8. Similar to P04 except stems are shorter, narrower and heavily reworked (Figure 14,a-c).

P08 N = 6. Finely made dart points with rectangular stems and straight or slightly convex bases; edges of stem are smoothed or crushed; shoulders have long barbs extending toward base; blade edges are convex (Figure 15,e-f).

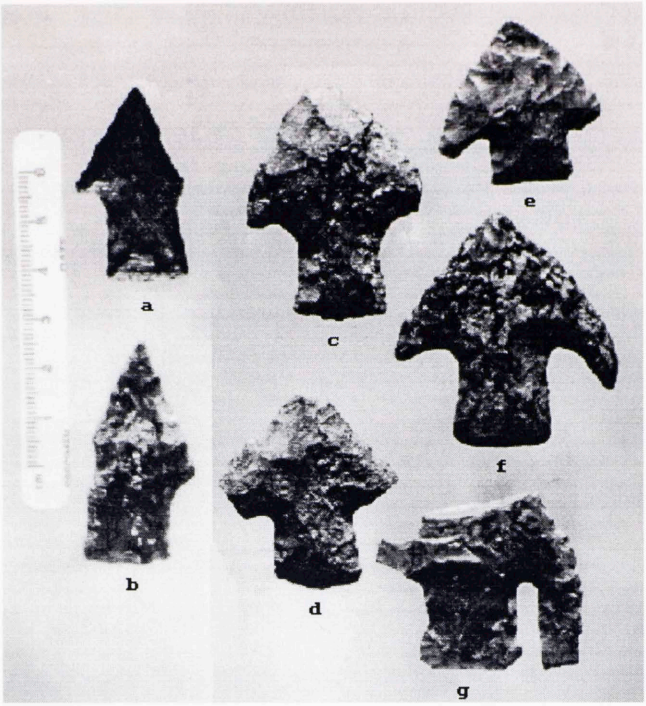


Figure 15: Parallel stem points. P11:a-b; P10:c-d; P08:e-f; P09:g.

P09 N = 1. Calf Creek (Perino 1968) point fragment with tip and 1 barb absent; form and workmanship very similar to P08 except barb extends down to base; stem is expanded at base (Figure 15,g).

P10 N = 4. Very similar to P08 in outline although P10 is a little smaller; smoothing and edge work is hard to identify because of material type (quartzite) and surface adhesives. One specimen might be a scraper because it has one flat face and a steeply beveled tip (Figure 15,c-d).

P11 N = 3. Very similar to P04 except blades are shorter and reworked and stems are slightly expanding; blade edges are very straight; points are small, i.e. stem is 1/2 of total length; shoulders are rounded to slightly barbed (Figure 15,a-b).

P13 N = 3. Large points with very short rectangular stems; blade edges are straight; barbs extend toward base; bases are very straight, wide, and rectangular. These specimens are similar to the Marshall spearpoint (Figure 16,g-i) (Bell 1958).

P14 N = 8. Very similar to P06 except stem corners are rounded; stems are slightly contracting; bases are straight to slightly convex with rounded corners; barbs range from extending slightly toward base to perpendicular to stem (not pictured).

P15 N = 7. Miscellaneous group of points with rectangular stems; bases straight with sharp corners; shoulders are barbed; four specimens have asymmetric/knife-like blades which are barbed on one edge only; two have significantly concave blade edges (Figure 16,d-f).

P16 N = 2. Point fragments with parallel stem edges; bases are not perpendicular, i.e. base corners form one acute angle and one obtuse angle (not pictured).

P17 N = 3. Small, very worn and damaged points; stems are rectangular; two specimens have critically damaged

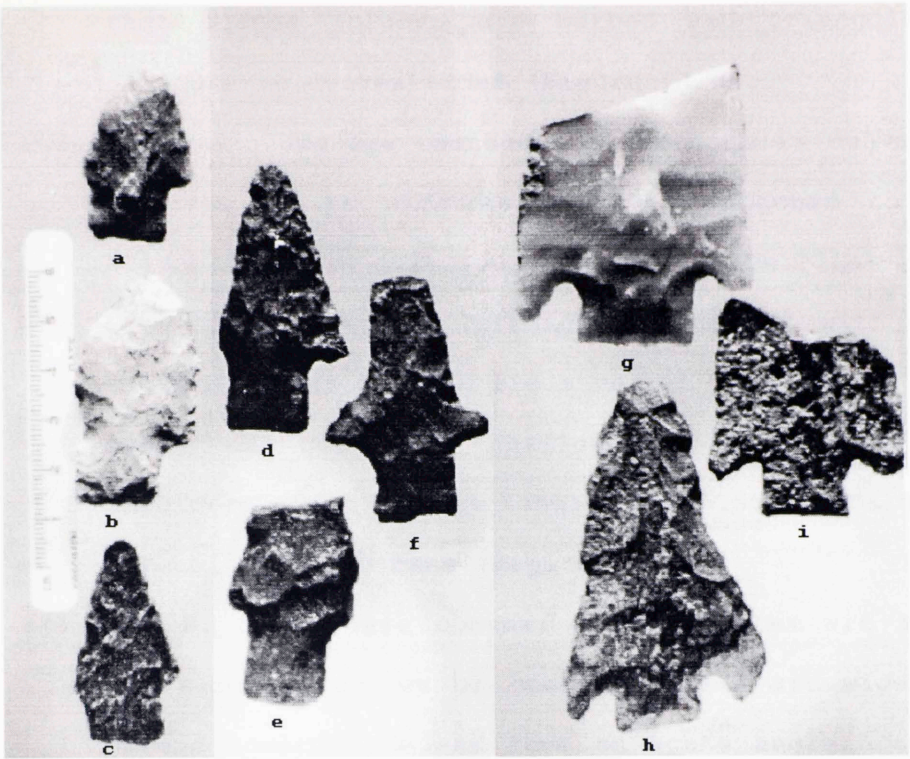


Figure 16: Parallel stem points. P17:a-c; P15:d-f; P13:g-i.

bases (Figure 16,a-c).

Expanding Stem Points

The expanding stem points are subdivided into 30 groups labeled X01-X11 and X13-X31. All tools with stems that expand, or diverge, toward the base, including side-notched tools, are classified as expanding stem points.

X01 N = 8. Stems are completely rounded and bulbous; notches are worked in from sides; stems are narrower

than blades; blades are barbed and triangular with straight to convex sides (Figure 17,a).

X02 N = 6. Stems are rounded and the base is convex; tang of base is as wide as shoulder; notched on sides; blades are triangular and convex (Figure 17,b-c).

X03 N = 15. Bases are straight to convex with rounded corners; sides of stem are straight or slightly convex; notch is generally shallow and stems are wide; shoulders form obtuse angle with stem, barb never extending toward base (Figure 17,d).

X04 N = 8. Bases are convex; sides of stem are straight and slightly convex or concave; bases are wide; barbs extend toward base and form an acute angle; one large almost complete specimen (Figure 17,e) is similar to Castroville point (Bell 1960).

X05 N = 2. Small arrow points; bases very straight; shoulder barbed; blade triangular (Figure 17,f-g).

X06 N = 13. Bases and sides of stem very straight; barbs extend toward base; corners of base are sharp (Figure 17,h-j).

X07 N = 7. Bases straight to slightly convex with concavity caused by apparent damage; corner of base is rounded; blades are triangular and slightly convex; barbs are perpendicular or create obtuse angle with stem (Figure 18,c-d).

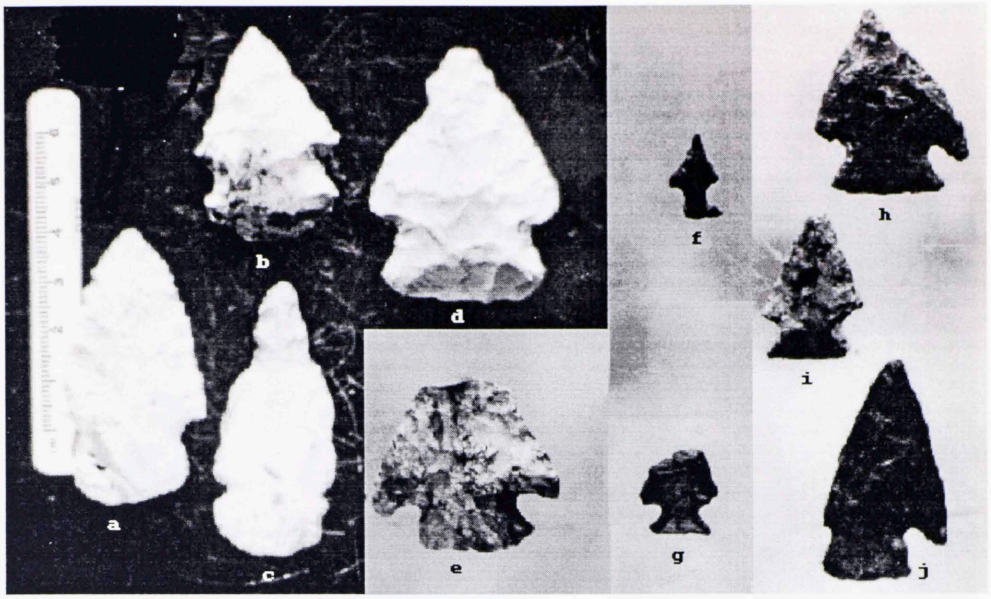


Figure 17: Expanding stem points. X01:a; X02:b-c; X03:d; X04:e; X05:f-g; X06:h-j.

X08 N = 7. Similar to X07 except barbs extend toward base; notch forms acute angle (Figure 18,e-f).

X09 N = 11. Similar to X07 and X08 except stems are narrower in proportion to blade and more rounded (Figure 18,a-b).

X10 N = 5. Longer blade and stem; stem narrower than blade; bases are straight or slightly convex or concave; corners of stem are rounded with convex line beginning about midway toward base; stems are long; barbs extend a little toward base (Figure 18,h).

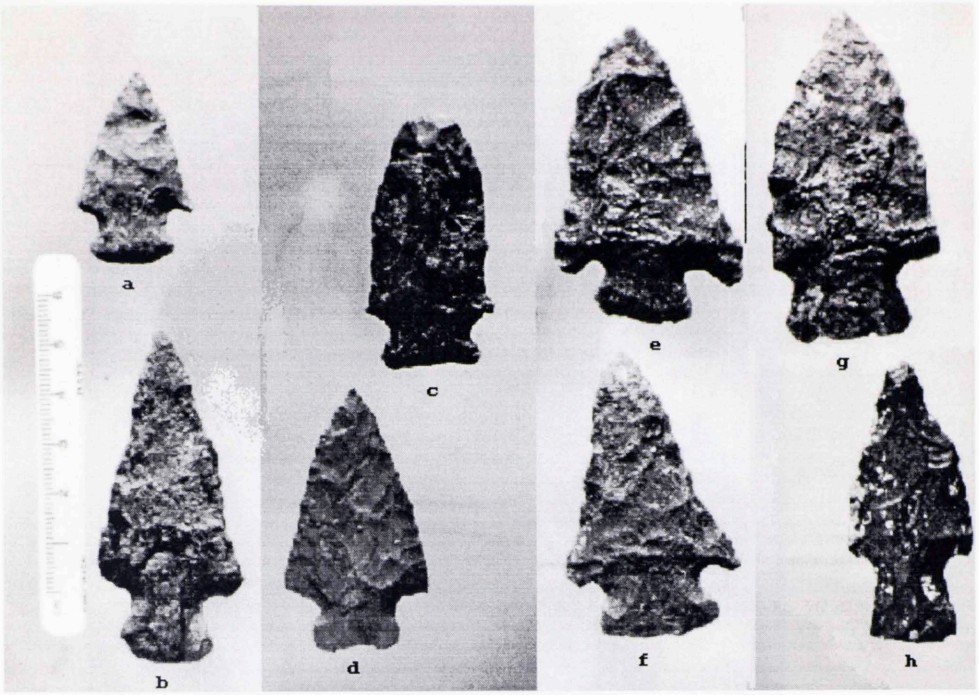


Figure 18: Expanding stem points. X07:c-d; X08:e-f; X09:a-b; X10:h; X11:g.

X11 N = 9. Stems are very similar to X10; shorter and wider than X10 (Figure 18,g).

X13 N = 5. Large points with wide stems and deep corner notches; similar to X32 except these are larger points and their stems are slightly more divergent; stems are nearly parallel or very slightly expanding; bases straight or slightly convex; barbs extend toward base; blades are wide with convex edges (Figure 19,a-b).

X14 N = 11. Stems are almost parallel or slightly expanding; bases are straight with sharp corners; two

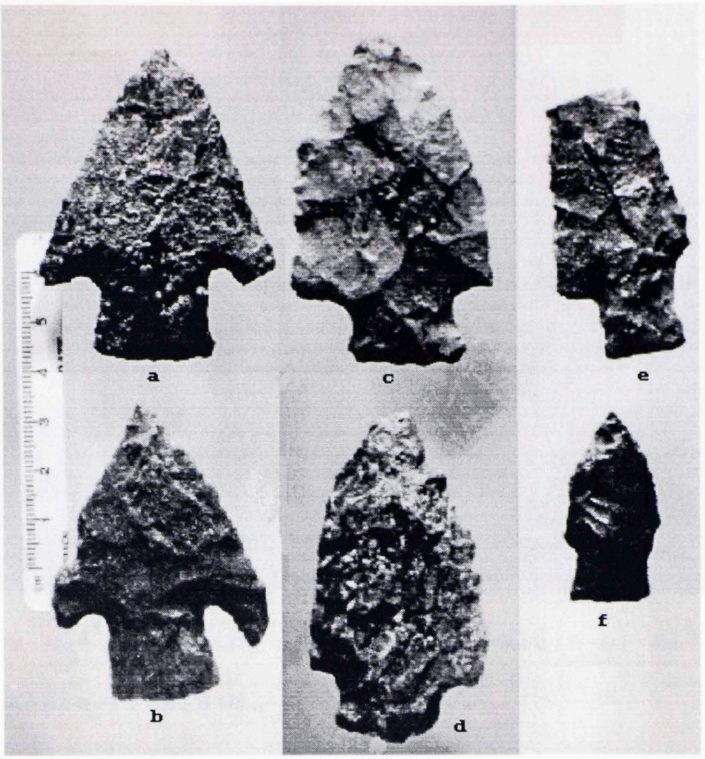


Figure 19: Expanding stem points. X13:a-b; X14:e-f; X15:c-d.

have barbs extending slightly toward base; all others have small shoulders perpendicular to blade; all but one are smaller than X13; blade edges are straight (Figure 19,e-f).

X15 N = 3. Short slightly expanding bases with rounded corners; similar to X07 but larger; blades on two are wide with convex edges (Figure 19,c-d).

X16 N = 4 fragments. Similar to X10 except stem expands more; barbs extend slightly toward base; base is

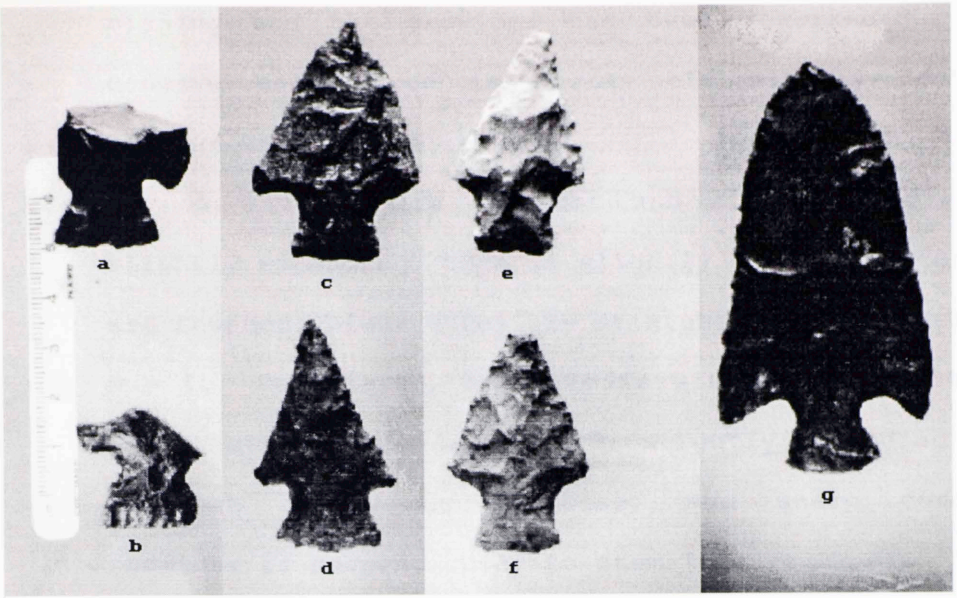


Figure 20: Expanding stem points. X16:a-b; X17:c-d; X18:e-f; X19:g.

straight (Figure 20,a-b).

X17 N = 8. Stem is strongly expanding; stem sides are concave shape, causing pointed tangs on base; shoulders are perpendicular to stem; blade edges are straight or slightly convex (Figure 20,c-d).

X18 N = 5. Very similar to X17 but concavity of stem edge is not as great and stems are narrower (Figure 20,e-f).

X19 N = 1. Motley point (Webb 1977); base is convex; notches are wide and deep; barbs extend toward base; blade is convex (Figure 20,g).

X20 N = 1. Stem has convex sides; deep notches; barb extends toward base; blade is spade shaped; one barb is

missing and the shoulder has been reworked to form concave edge; base is broken off bluntly; outline similar to X32 (Figure 21,a).

X21 N = 5. Stems are straight and almost parallel or slightly expanding; base is slightly convex and corners are rounded; blade edges are straight (not pictured).

X22 N = 1. Very large, heavy knife with asymmetric blade edges; stem is similar to X03; slightly expanding with straight sides, convex base, and sharp corners; shoulder is perpendicular to stem (Figure 22,e).

X23 N = 3. Short stem with very shallow notches and slight shoulders; notch appears to be on side; sides of stem are slightly convex; base is straight (Figure 21,b-c).

X24 N = 2. Long triangular point with side notches; stem is wider than blade, large sections of the base are missing (Figure 21,d-e).

X25 - X30 are expanding stem points with concave bases.

X25 N = 2. Finely worked continuously concave bases; slightly expanding stems; shoulders perpendicular to stem (Figure 21,f-g).

X26 N = 6. Concavity near center of base; corners of bases are rounded; shoulders are pronounced; barb extends toward base (Figure 21,h-i).

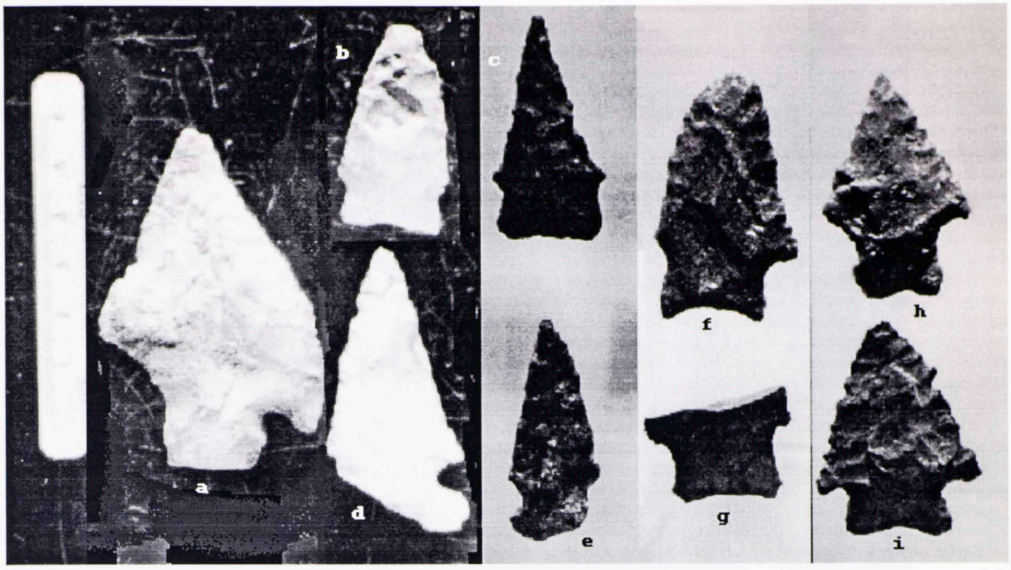


Figure 21: Expanding stem points. X20:a; X23:b-c; X24:d-e; X25:f-g; X26:h-i.

X27 N = 1. Stem is very slightly expanding with very rounded corners and deep basal notch. Similar to Cossatot River type (Figure 23,b) (Perino 1985).

X28 N = 1. Widely expanding, flaring stem with deep narrow notches; tangs of base are pointed; base is concave. This point is similar to the Martindale type (Figure 22,f) (Bell 1960).

X29 N = 1. Very small side notched point with very shallow, wide notches; base is concave (Figure 23,a).

X30 N = 3. Reworked Dalton points (Bell 1958); one has very shallow side notches; symmetrically beveled blade edges. Second specimen is a heavily reworked Dalton-

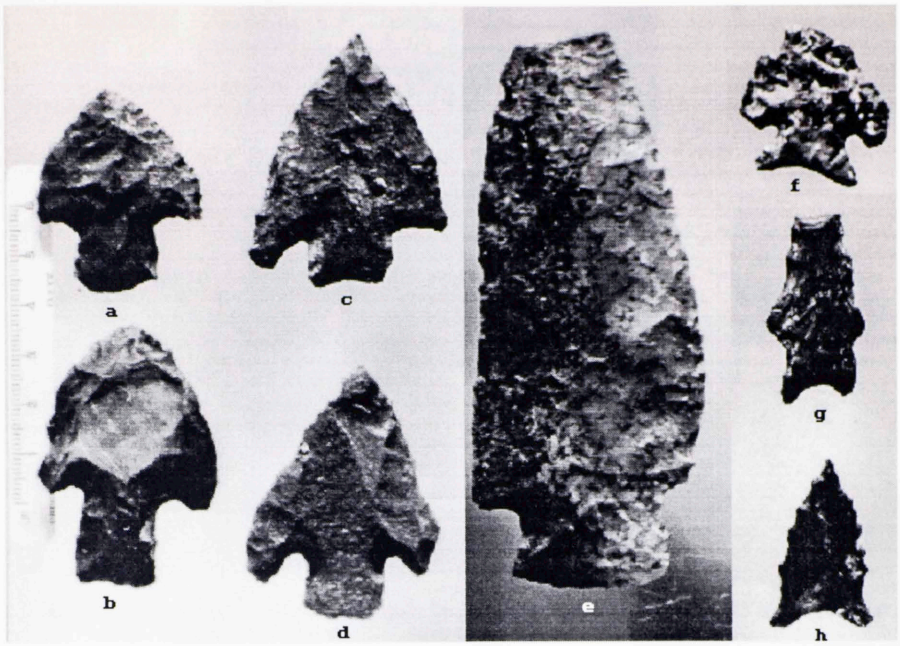


Figure 22: Expanding stem points. X22:e; X28:f; X30:g-h; X31:a-b; X32:c-d.

like tool; side notches are deeper than Dalton point; blade is similarly beveled (Figure 22,g-h).

X31 N = 6. Slightly expanding stem with convex sides and base and rounded corners; blades are spade-shaped (Figure 22,a-b).

X32 N = 5. Slightly expanding stem; base convex or concave; deep notches; wide blade; long tangs; similar to X31 (Figure 22,c-d).

X40 N = 6. Expanding stem with deep narrow corner notches; barbs extend toward base; base is convex (Figure 23,c).

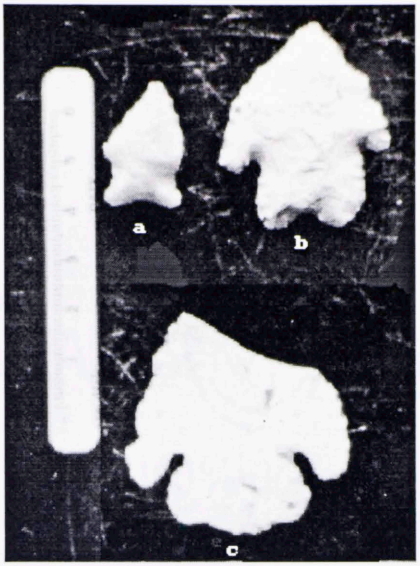


Figure 23: Expanding stem points. X27:b; X29:a; X40:c.

Axes and Hoes

The following group of bifaces exhibit formal properties of axes or hoes. These are generally the largest lithic artifacts in the study sample. Most have thick hafting areas and are very heavy tools.

A01 N = 6. Stemmed axes with a single bit, or working edge, which is convex or bulbous in outline (Figure 24,a-b).

A02 N = 1. Similar to A01 except hafting area is nearly as wide as bit; stem base is broken off (Figure 24,c).

A03 N = 2. Hoes, thinner with less formal design than A01 or A02; one nearly triangular; one oval or rectangular

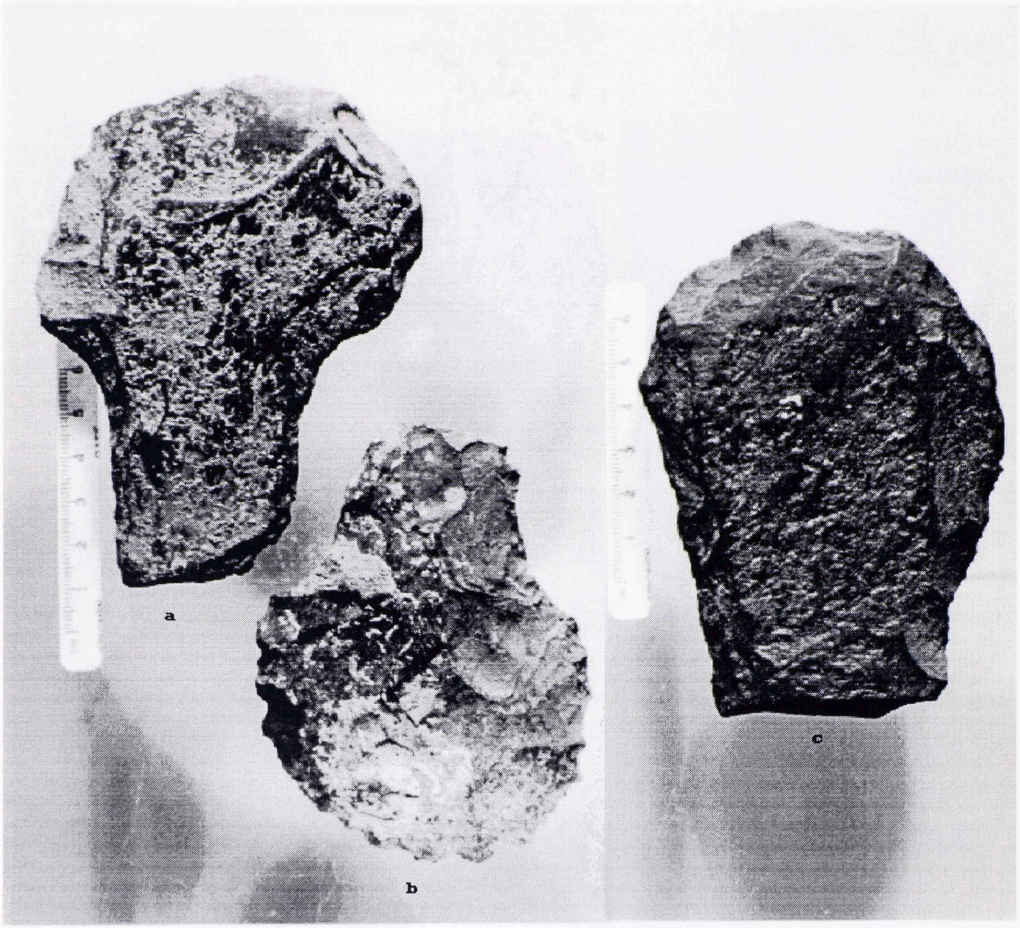


Figure 24: Axes and Hoes. A01:a-b; A02:c.

with asymmetric end (Figure 25,a-b).

A04 N = 3. Double-bitted, symmetrical axes with central hafting area; the working edges are convex and bulbous, similar to A01 (Figure 25,d).

A05 N = 2. Large, flat, rectangular fragments of central

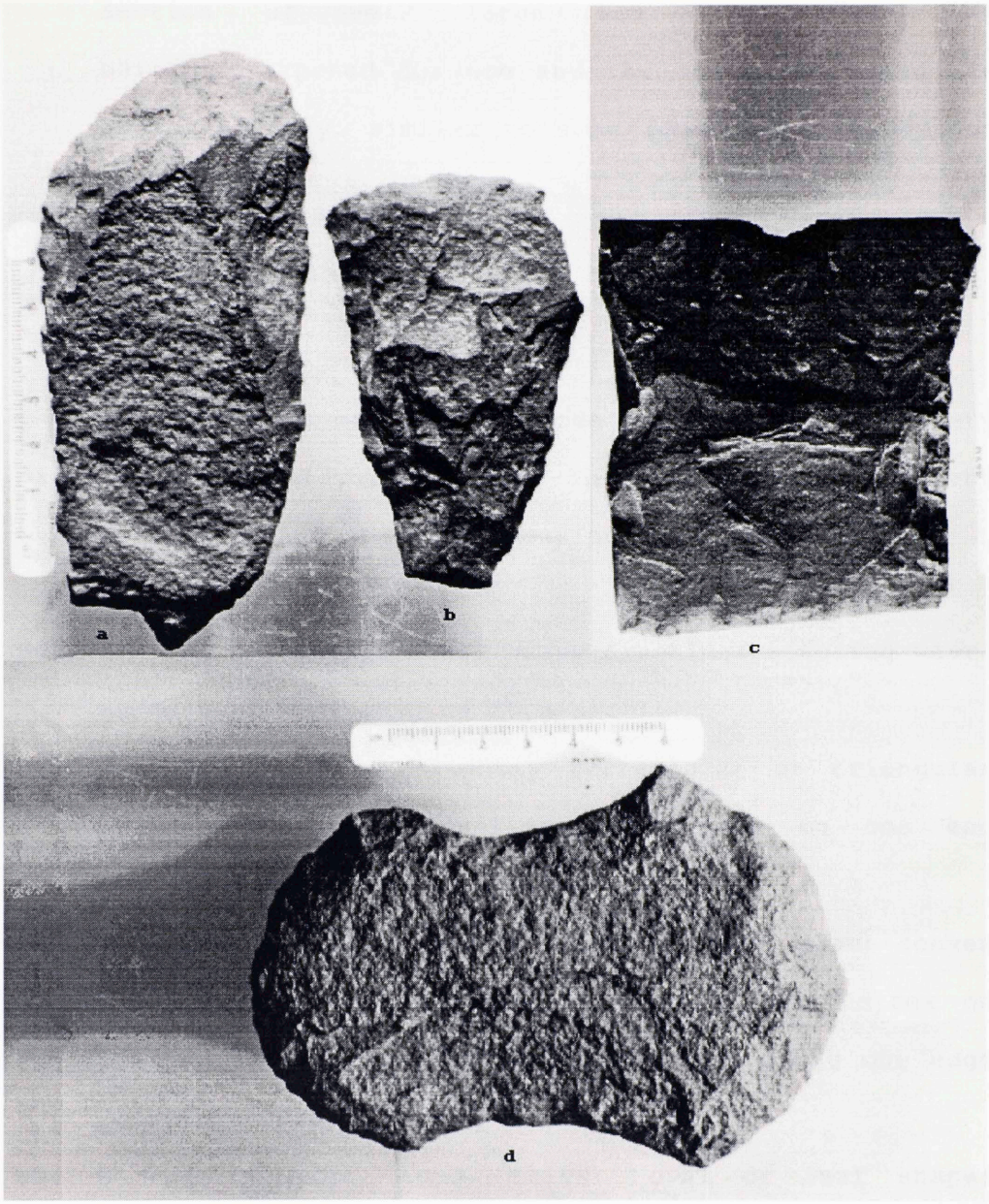


Figure 25: Axes and Hoes. A03,a-b; A04,d; A05,c.

section of very large hoe; two edges are beveled/sharpened for use and the other two edges are broken bluntly; similar to some found at Spiro Mounds (Figure 25,c) (Brown 1976).

Bifaces

The following group of bifaces contain a wide variety of attributes and properties. These artifacts represent many tool types and stages of manufacture.

B01 N = 3. Egg-shaped/oval; heavy crushing/battering wear on or near ends (Figure 26,a-b).

B02 N = 3. Oval or slightly rectangular or triangular shape with large beveling flake scar on one end (possibly scrapers) (Figure 26,c-d).

B03 N = 2. Large tear drop shape with plano-convex profile; one has fragment of platform and cortex on pointed end; another has cortex section along one edge (possibly scrapers) (Figure 26,e-f).

B04 N = 5. Large, long, thick oval or leaf shape; asymmetric outline (Figure 27,c-d).

B05 N = 4. Large thinned teardrop; very round at one end and nearly pointed at other end; pointed end looks damaged (Figure 27,a-b).

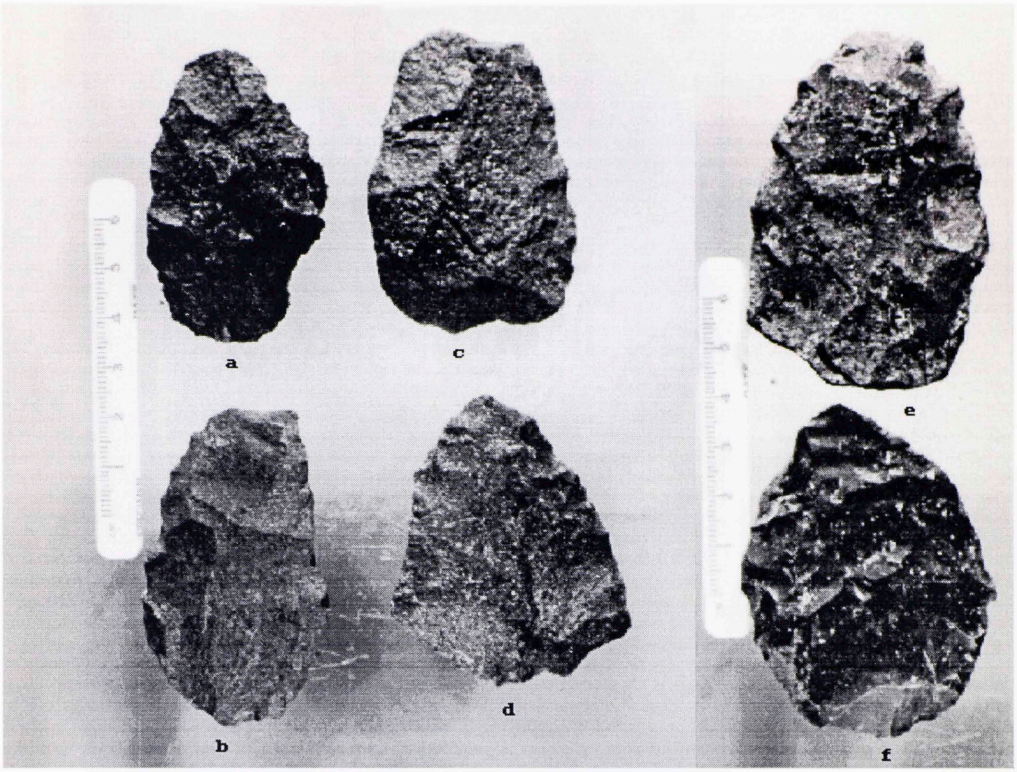


Figure 26: Bifaces. B01:a-b; B02:c-d; B03:e-f.

B06 N = 7. Thinned ovals with rounded ends; three have ends broken off; wear and edgework are asymmetric; possibly used as knives or side scrapers (Figure 28,a-c).

B07 N = 4. Thinned triangles; asymmetric sides, except for one specimen which has a flat side like a scraper (Figure 28,d-e).

B08 N = 9. Thinned and finely shaped preforms; oval, teardrop, or slightly triangular in outline (Figure 29,a-b).

Figure 27: Bifaces. B04:c-d; B05:a-b.

B09 N = 3. Rectangular with carefully beveled edge (possibly scrapers) (Figure 31,f).

B10 N = 3. Miscellaneous; one specimen is a four-sided polyhedral core; one fragment has a worked/used groove along one edge and appears to be a tip fragment of a boatstone made of polished hematite (Newkumet 1940); two specimens are of hematite (not pictured).

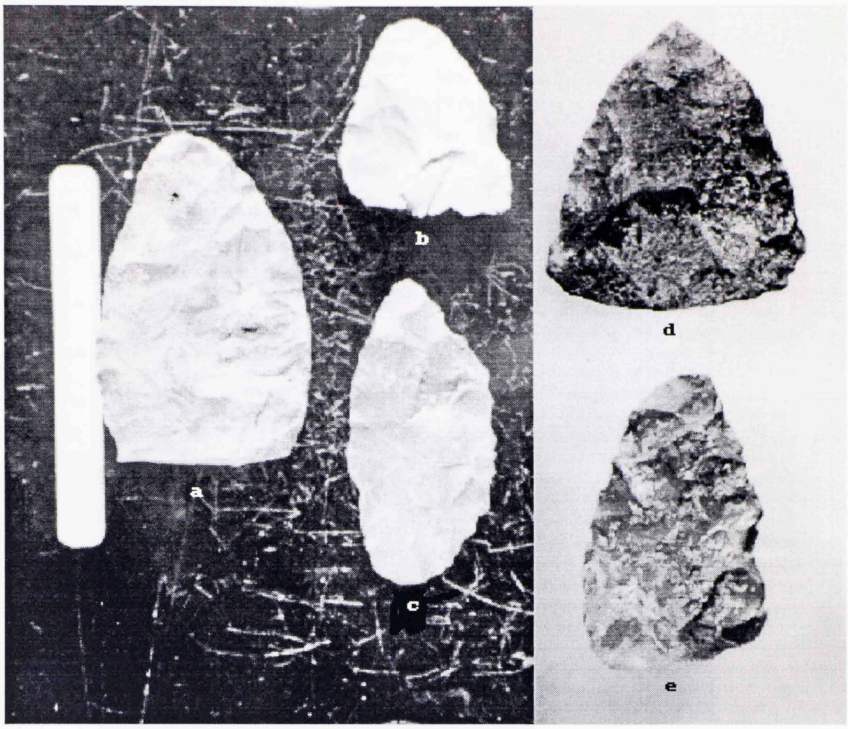


Figure 28: Bifaces. B06:a-c; B07:d-e.

The following are smaller bifaces.

B11 N = 10. Very thin, finely shaped; triangular except one which is willow-leaf shaped; probably preforms, knives, fine cutting tools or scalpels (Figure 30,a-e).

B12 N = 3. Very small, triangular or willow-leaf shape; heavily used (Figure 30,f-g).

B13 N = 6. Very small; badly battered; miscellaneous shapes (Figure 31,a-c).

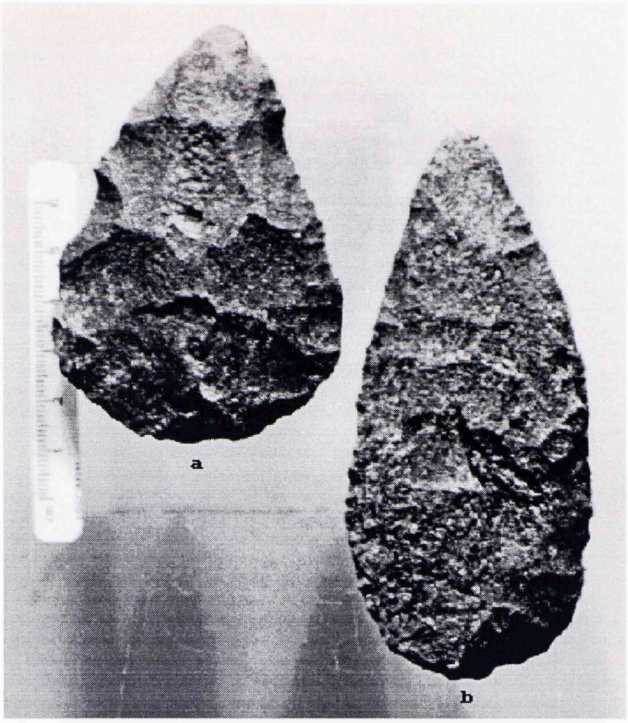


Figure 29: Bifaces. B08: a-b.

B14 N = 3. Small round or oval cores; one cobble badly damaged with pecking scars is perhaps a hammerstone; two others have cortex removed with edge damage evident (Figure 31,d-e).

B15 N = 14. Asymmetrically worked and used bifaces; probably knives; most with hafting areas (Figure 32,e-g).

B16 N = 6. Long narrow but thick bifaces; heavily worked and reworked; willow-leaf and triangular shapes (Figure 32,h-i).

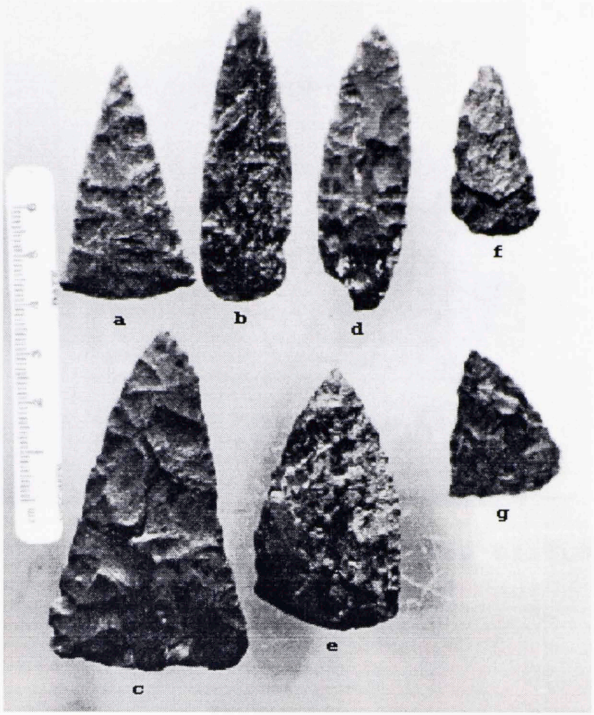


Figure 30: Bifaces. B11:a-e; B12:f-g.

B17 N = 9. Miscellaneous group with long, narrow, pointed working ends; probably drills and gravers (Figure 32,a-d).

Flakes

Only 14 artifacts can be classified as flakes. These have unmodified ventral faces and all except one are quite thin. Two of these artifacts are very small conjoinable fragments of a single biface thinning flake. All the flakes

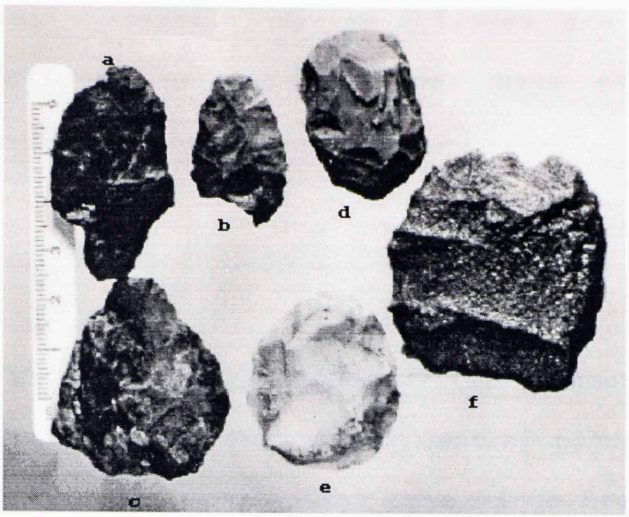


Figure 31: Bifaces. B13:a-c; B14:d-e; B09:f.

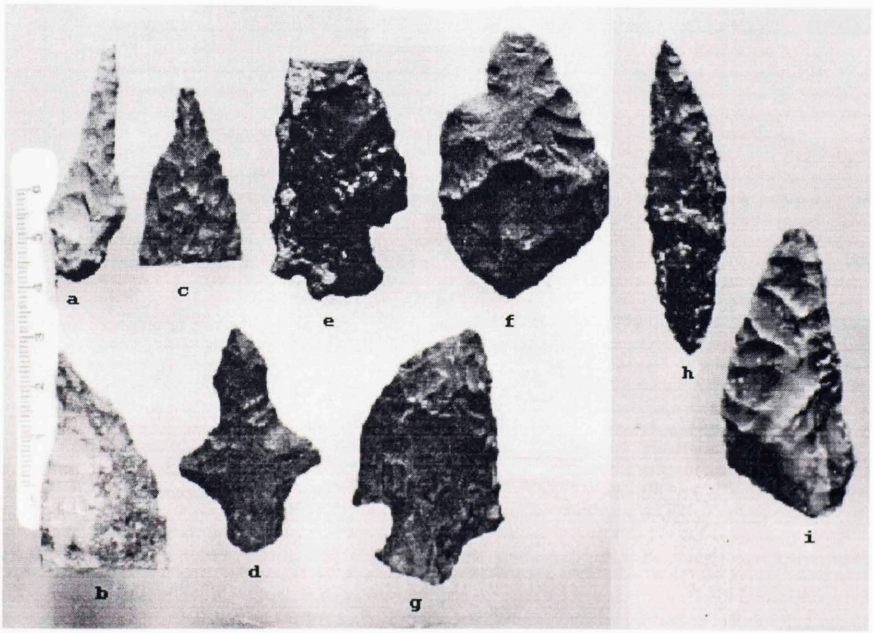


Figure 32: Bifaces. B15:e-g; B16:h-i; B17:a-d.

except one have previous thinning flake scars on their dorsal surfaces. Eleven flakes are large with nearly symmetrical outline and most have evidence of use or retouch.

Tip and Blade Fragments

This category includes 37 tip fragments in a wide range of sizes and shapes and six central blade fragments with no tip. Seventeen fragments have hinge break scars which are usually associated with bending actions rather than impact.

Chapter 3

Analysis

Analysis of Lithic Raw Materials Usage

High quality lithic raw material is abundant in eastern Oklahoma. A wide variety of chert, flint and quartzite is available in outcrops of the Ouachita and Ozark mountains. Many materials also occur as cobbles and slabs washed into the streams and rivers of the area (Banks 1984, 1990). This investigator was able to find several usable samples of chert and quartzite along the lakeshore in the vicinity of the Mackey site in only a few minutes. The experienced and motivated prehistoric inhabitants would have had to expend very little time and energy in maintaining an adequate supply of materials.

An important goal of identification of raw materials is differentiation between local and non-local materials. Local materials are defined as materials originating in the Ouachita Mountains and available in the Fourche Maline or Poteau River drainage. This will exclude Arkansas novaculite, which originates in the southern Ouachita Mountains and is most likely not available in the northern Ouachita drainage. In general, lithic material from the Ouachitas is easily distinguishable from those originating

north of the Arkansas River in the Ozarks. Although some Ozark material is available as cobbles along the Arkansas River which is only 20 miles north of the site, they are not available in the immediate vicinity, as is the Ouachita material. Therefore, materials identified as originating in the Ozarks are considered non-local.

The ready availability of high quality lithic material in this area along the northern edge of the Ouachita Mountains is, no doubt, one of the factors responsible for the long occupation of this and other midden mounds. The commodity is available to, and is probably freely used by, all of the inhabitants in the performance of their day-to-day activities. One would not expect to find a great deal of evidence for conservation of raw materials in this area.

The following series of tables present the raw material data in a hierarchical view. Table 1 includes the entire study sample. The next three tables subdivide each column of the first table. The tables show the number of artifacts in each material group for each level. They also show the percentage of the artifacts at each level that are represented by each material group.

Table 1 compares material usage of three major categories. The LOCAL category is a combination of Type A chert, Type B chert, and quartzite. The OZARK category is a

Table 1: Major Categories of Raw Materials

1 Foot Level	Local Material	Ozark Material	Other Material	Level Total	Rate of Change
1	97 69%	38 27%	6 4%	141	+15%
2	73 59%	39 32%	11 9%	123	-11%
3	103 75%	27 19%	8 6%	138	+10%
4	80 64%	42 33%	4 3%	126	-5%
5	94 71%	27 21%	11 8%	132	+164%
6	34 68%	15 30%	1 2%	50	+47%
7	28 82%	6 18%	0	34	-8%
8	23 62%	10 27%	4 11%	37	+61%
9	13 57%	9 39%	1 4%	23	+92%
10	9 75%	2 17%	1 8%	12	
Totals	554 68%	215 26%	47 6%	816	

combination of white and grey cherts of the Boone formation. The OTHER category is a combination of all the remaining subgroups that have been described previously.

The total number of artifacts increases more or less steadily from level ten through level six. At these lower levels, the rate of increase between levels varies from 47% to 92%, not including a slight decrease between levels eight and seven. There is a dramatic increase in the total number of artifacts between levels six and five. Between level six and level five, the number of artifacts increases by 164%. From level five on up to level one, the total number of artifacts is fairly stable. The largest rate of increase is

only 15% between level two and level one, and level one contains only 7% more artifacts than level five. This general pattern of change is nearly the same for all material types.

Local materials are clearly dominant and represent 68% of the study sample. Use of local materials increases constantly from level ten through level five. Above level five, some fluctuation in frequency occurs, and the peak in local materials is at level three. The percentage of artifacts made from local materials fluctuates throughout the stratigraphic sequence, ranging from 57% to 82%. Based on the data from excavated levels, there does not appear to be any consistent change or trend, either increasing or decreasing, in the preference for local materials. The overwhelming preference for local materials is undoubtedly due to the abundant availability of these high quality materials in the immediate vicinity as stream cobbles.

Although materials identified as originating from the Ozark Mountain region represent only 26% of the total sample, these data exhibit characteristics very similar to the local materials. With the exception of a slight dip at level seven, the Ozark materials increase constantly from level ten through level four. After peaking at level four, the frequency of Ozark materials fluctuates from level four to level one. Preference for Ozark materials fluctuates

throughout the sequence from 17% to 39% and consistent trends toward increasing or decreasing preference are not evident. A consistent presence of Ozark materials is evident throughout the sequence. Ozark materials comprise at least 27% of the sample in six out of ten levels.

Table 2 is a breakdown of the local materials category into its three subgroups: type A chert, type B chert, and quartzite. Quartzite is the dominant type, composing 68% of the local materials. Changes in the occurrence of quartzite through the sequence follow the same fluctuation pattern as the larger category of local materials as well as the total artifact count. The occurrence of quartzite, local materials and total number of chipped stone artifacts increases constantly from level ten through level five, dip at level four, increases at level three, decreases again at level two and increases again at level one. This pattern of change is in direct contrast with that of the Ozark materials, which peaks at levels two and four and dips at level three. The frequency of type B chert fluctuates throughout the entire sequence, reaching a peak at level three which is followed by a sharp decline at levels one and two. The occurrence of Type A chert exhibits a different pattern of change, increasing slowly from levels ten through three, where its frequency peaks, then decreasing significantly in the

Table 2: Distribution of Local Raw Materials

1 Foot Level	Type A Chert	Type B Chert	Quartzite	Total
1	11 11%	10 10%	76 79%	97
2	10 14%	4 5%	59 81%	73
3	16 16%	20 19%	67 65%	103
4	15 19%	15 19%	50 62%	80
5	15 16%	19 20%	60 64%	94
6	5 15%	8 23%	21 62%	34
7	5 18%	4 14%	19 68%	28
8	2 9%	6 26%	15 65%	23
9	2 15%	3 23%	8 62%	13
10	2 22%	4 45%	3 33%	9
Total	83 15%	93 17%	378 68%	554

upper two levels. The percentages of types A and B chert fluctuate throughout the sequence, and both decline sharply above level three. In these upper two levels, the percentages of quartzite are at their highest.

Table 3 shows a breakdown of the Ozark materials into two general categories of white and gray cherts. Gray cherts represent 60% of the Ozark material. The significance of this breakdown is difficult to address. White and gray cherts are found side by side in some outcrops in the Ozark region (Banks 1990).

Table 3: Distribution of Ozark Materials

1 foot Level	Gray Chert	White Chert	Level Total
1	25 66%	13 34%	38
2	24 62%	15 38%	39
3	17 63%	10 37%	27
4	25 60%	17 40%	42
5	18 67%	9 33%	27
6	8 53%	7 47%	15
7	3 50%	3 50%	6
8	6 60%	4 40%	10
9	4 44%	5 56%	9
10	0	2 100%	2
Totals	130 60%	85 40%	215

Table 4 shows the breakdown of the small category of OTHER raw materials. The "other" category is a very small component, only 6%, of the study sample and exhibits a unique distribution. Percentages of level are not shown in Table 4 because the quantities are so small that the percentages are essentially useless. With the exception of Arkansas novaculite, the most significant type in this category, none of these unusual materials occurs in the lowest four levels of the deposit. Hematite, sandstone, slate, and argillite are used for only the largest artifacts in the collection, namely axes, hoes and large bifaces.

Table 4: Distribution of Other Raw Materials

1 Foot Level	Hematite	Sandstone/ Slate	Novaculite	Argillite	Greystone	Level Total
1	0	1	4	1	0	6
2	0	2	4	4	1	11
3	2	0	5	0	1	8
4	1	0	2	0	1	4
5	4	0	5	0	2	11
6	0	0	0	0	1	1
7	0	0	0	0	0	0
8	0	0	4	0	0	4
9	0	0	1	0	0	1
10	0	0	1	0	0	1
Totals	7 15%	3 6%	26 55%	5 11%	6 13%	47

Novaculite is abundant in the lower and eastern portions of the Ouachita Mountain uplift and was aggressively quarried in prehistoric periods (Banks 1990). The preference for use of novaculite in those other areas of the Ouachita Mountains is comparable to the preference for quartzite in the Fourche Maline area.

The consistent presence of Ozark materials throughout the stratigraphic sequence is problematic. It would be difficult to determine the original source of this raw material. The nearest possible natural source is the Arkansas River valley, 20 miles north of the Fourche Maline/Poteau convergence, which is the immediate vicinity of the Spiro Mounds ceremonial center. The persistent usage of Ozark materials throughout the stratigraphic sequence at the Mackey site indicates that some degree of mobility or

trade persisted which resulted in the acquisition of these materials. The occurrence of these materials may be the direct result of the social and economic strategies which were responsible for the construction of Spiro. Excursions to the major river bottom flatland along the Arkansas would have been a fairly easy journey to exploit a slightly different biological environment. However, the range of mobility may extend further north into the Ozark Mountain region as well.

A number of sites in the Ozark region of northeastern Oklahoma and northwestern Arkansas show similarities to sites in the Fourche Maline area. There are many artifact similarities, such as contracting stem points and other point types (Baerreis et. al. 1958, Stahle 1986, Dickson 1991). However, very few of the raw materials originating in the Ouachita Mountains are found in Ozark area assemblages (Dickson 1991).

Significant quantities of flint used to make artifacts at Poverty Point in northern Louisiana have been identified as originating in the Ouachita Mountains of Oklahoma (Webb 1977). This may indicate that trade in lithic material flowed in a southerly direction. Ozark material was moved south to the Fourche Maline area, and Ouachita material was traded south to Poverty Point. This pattern would also correspond with the direction of drainage systems if the use

of stream cobbles was a primary strategy in lithic tool production.

To summarize the analysis of material types, there are several major observations. The use of local materials, especially quartzite, is preferred throughout the sequence. The fact that the pattern of change in the occurrence of quartzite corresponds to the pattern exhibited by the entire sample of artifacts indicates that the use of quartzite may be a determining factor in the evolving lithic technology of the site.

There is a persistent usage (ranging from 17% to 39%) of material originating in the Ozark Mountain formations. The ratio of local to non-local material fluctuates a little but is relatively constant throughout the sequence. Significant changes are not evident in preference or usage of local versus non-local materials. The consistent use of Ozark materials is significant, especially when compared to the limited use of novaculite which is very popular in the southeastern Ouachitas. It is also important to note that more Ozark material is in this collection than the locally available A and B chert types, which are similar fine grained cherts. This preference for Ozark materials over local cherts and novaculite indicates that travel and/or contact with areas north of the Fourche Maline Creek are very important components of the technological, economic, or

social strategies of the Fourche Maline people.

Finally, the absence of debitage and unmodified flakes severely inhibits further analysis of the structure of regional lithic procurement and utilization.

Analysis of Artifact Types

The total number of artifacts in the study sample is 816. This includes the complete chipped stone assemblage from all squares that did not contain burials. The following series of tables presents the tool forms in a hierarchical view as did the tables of raw materials. The first table, Table 5, shows the distribution of the four main categories of artifacts by stratigraphic level. Eighty percent of the artifacts are points. Although the blade and tip fragments cannot be accurately identified as point fragments, most have symmetric attributes and are probably point fragments. The biface category consists of axes, hoes, drills, gravers, knives, scrapers, preforms and other nonspecific or fragmentary bifacially worked artifacts.

Table 6 breaks the points down into four major groups. Only three points are classified as small arrow points based on the narrow width of their stems. Two are corner notched expanding stem points and the third is side notched. These

Table 5: Major Categories of Tool Types

1 foot Level	Bifaces	Flakes	Points	Blade/Tip fragments	Level Totals	Rate of Change
1	20	0	114	7	141	+15%
2	22	1	94	6	123	-11%
3	17	1	108	12	138	+10%
4	20	4	94	8	126	-5%
5	16	2	108	6	132	+164%
6	5	3	42	0	50	+47%
7	4	0	29	1	34	-8%
8	2	3	31	1	37	+61%
9	2	0	21	0	23	+92%
10	0	0	10	2	12	
Totals	108 13%	14 2%	651 80%	43 5%	816	

points were recovered from the upper two levels of deposit. The rest of the points are probably dart and spear points. They are generally heavy with wide stems and would probably not work efficiently in a bow and arrow configuration.

Contracting stem points comprise 57% of the point category. The occurrence of contracting stem points increases steadily from level nine through level five. From level five through level one, their numbers fluctuate in a familiar pattern that was previously observed for local and quartzite materials and total artifacts. Their numbers peak at levels five, three and one, with dips in frequency at levels two and four.

Parallel stem and expanding stem points exhibit very different patterns of change throughout the stratigraphic sequence. The frequency of parallel stems peaks at level eight and again at level three. The number of expanding

Table 6: Distribution of Major Point Categories

1 foot Level	Small Arrow Points	Contracting Stem Points	Parallel Stem Points	Expanding Stem Points	Level Totals
1	2 2%	85 75%	7 6%	20 17%	114
2	1 1%	60 64%	8 8%	25 27%	94
3	0	65 60%	17 16%	26 24%	108
4	0	55 58%	12 13%	27 29%	94
5	0	74 68%	15 14%	19 18%	108
6	0	18 43%	7 17%	17 40%	42
7	0	8 28%	10 34%	11 38%	29
8	0	3 10%	10 32%	18 58%	31
9	0	2 9%	9 43%	10 48%	21
10	0	4 40%	1 10%	5 50%	10
Totals	3 <1%	374 57%	96 15%	178 27%	651

stems peaks at levels eight and four. Although contracting stems dominate the total collection of tools, parallel stem and expanding stem points dominate levels ten through six.

In levels ten through seven, parallel and expanding stems comprise 81% of the points. From these data, parallel and expanding stems were clearly the preferred styles in the oldest four or five levels of deposit. Although contracting stem points occur at all levels, less than 5% of them are found in levels ten through seven. The presence of such a small percentage at these deeper levels could be attributed to post depositional mixing rather than early usage.

The distributions of the parallel stem points and expanding stem points are presented in Tables 7-9. Some point types are combined into larger groups because of their similarities in physical attributes and distributions. This recombination facilitates the comparison and analysis of the distributions of general styles of points.

Table 7 shows the distribution of the earliest parallel stem and expanding stem points. PG1 is a combination of types P01, P02 and P03. These are grouped into an intermediate category based on their wide rectangular stems and general thickness. Their distributions are also very similar. Twenty specimens in this group occur in levels five through ten of the deposits. PG2 groups together point types P08, P09, P10 and P11 because they all have thin, rectangular, finely shaped stems that expand slightly at the base. The form and size of the stems are very uniform and most of the stem edges appear to be ground. The single Calf Creek point specimen is in this group. Nine of these points were recovered from levels five through nine. The points recovered from levels two and three are from squares at the very edge of the mound and at or near the bottom levels of those squares.

Type P05 points are listed separately because their formal qualities are somewhat unique among parallel stem points. Some stems are slightly contracting but they occur

Table 7: Parallel and Expanding stem points

Level	PG1	PG2	P05	P13	XG1	XG2	XG3	XG4	XG5	X07
1	1	0	0	0	1	2	3	0	2	0
2	1	1	0	0	3	5	2	1	0	0
3	1	4	0	0	0	1	1	0	1	1
4	0	0	2	0	0	5	1	1	4	0
5	4	3	1	1	2	2	3	0	2	2
6	2	2	0	0	1	2	3	1	1	0
7	2	1	1	2	1	0	3	1	0	0
8	4	2	1	0	2	5	1	3	0	4
9	7	1	1	0	4	1	0	0	1	0
10	1	0	0	0	0	0	1	1	0	0
Total	23	14	6	3	14	23	18	8	11	7

at lower levels than most contracting stem points. Their outline resembles contracting stem point C01 except for their convex bases. This type may represent an early form of contracting stem point.

P13 consists of three points whose general configuration distinguishes this group from the others. They have short rectangular stems dwarfed by very large broad blades with deep corner notches and barbs extending almost to the base. These points are similar to the Marshall type.

XG1 combines types X01 and X02 together because of their completely rounded, extremely convex stems. These points are similar to the Palmillas or Williams types. Ten specimens were recovered from levels five through nine. Two others are from the bottom level of shallow squares on the edge of the site.

XG2 combines types X03 and X04 because they have

similar deep corner notches and wide expanding stems with slightly convex bases. Most of these points have rounded stem corners as well. X04 points have wider notches and similar extending barbs. X03 points have very wide notches and rounded shoulders that do not extend toward the base. Ten of these were recovered from levels five through nine. Nine others are from shallow squares on the edge of the site and are at or near the maximum depth of those squares.

XG3 contains types X10, X11 and X16. These are the largest of the expanding stem points. Their bases are straight or slightly convex and the stem corners are rounded. X11 samples are generally wider and thicker specimens. X10 points are thinner in profile with long narrow stems. X16 points have wide short stems. All have wide corner notches and their shoulders are distinct but do not extend toward the base. Eleven of these points are from levels five through ten, and three are from shallow edge squares. Of the three types in this group, X10 has the least consistent distribution with three points from levels one and two, and two points from level seven.

XG4 is a combination of types X13 and X15. These are also large expanding stem points with deep, wide corner notches and slightly expanding stems. X13 points are more symmetrical with smoothly finished surfaces, whereas X15 are roughly and irregularly thinned. Both of these groups are

small. Six points are from levels six through ten and one other point is from the deepest level of its square.

XG5 contains type X31 and X32. These points have slightly expanding, almost parallel stems. Their stems, in general, are somewhat irregular, and these are considered to be contingent types. That is, although they are similar, in some respects, to some of the other point types, it was difficult to associate them because of their roughly shaped, irregular forms. They are grouped together largely on the basis of the shape of their blades. X31 points have longer stems with blades that are spade shaped. X32 points are very similar to X31, but their tangs are longer and extend toward the base. Although eight of these occur above level six, most of them are in the deepest levels of their squares.

Type X07 is listed separately. Their stems with distinctively rounded tangs are unique among the types that occur in lower levels.

Table 8 shows the distributions of a number of expanding stem point types that are so distinctive in formal characteristics that regrouping them does not seem appropriate. Point types X19, X20, X22, X23, X27 and X29 were recovered from levels five through nine and were from the deepest levels of their squares. One of the X30 points is a Dalton point, recovered from level eight. Type X26

Table 8: Unique Expanding stem points

Level	X19	X20	X22	X23	X24	X25	X26	X27	X28	X29	X30
1	0	0	0	0	0	1	1	0	1	0	1
2	0	0	0	0	1	1	1	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	1
4	0	0	0	0	0	0	1	0	0	0	0
5	0	0	0	1	0	0	0	0	0	1	0
6	0	1	0	1	0	0	2	0	0	0	0
7	0	0	0	0	0	0	1	0	0	0	0
8	1	0	0	0	0	0	0	1	0	0	1
9	0	0	1	0	1	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0
Total	1	1	1	2	2	2	6	1	1	1	3

points occur in the deepest and middle levels.

Type X24 has a low/high bipolar distribution probably indicating a classification or sampling problem. Types X25 and X28 are found only in the upper two levels.

Table 9 shows distributions of four contingent point types and nine late point types. The contingent point types are represented by columns PG3, X14 and X21. PG3 consists of parallel stem point types P16 and P17. These point types are referred to as 'contingent' because either the condition of the points or their workmanship made it difficult to identify them as particular types. Their widely varied distributions confirm this classification problem. The remaining columns in Table 9 represent point types from the upper levels of deposits assigned to later time periods than most points in Tables 7 and 8. PG4 combines types P04, P07

Table 9: Miscellaneous parallel and expanding stem points

Level	PG5	X14	X21	X40	PG3	PG4	X05	X25	X28	XG6	XG7
1	2	1	2	1	1	1	2	1	1	1	1
2	1	1	1	1	2	3	0	1	0	1	2
3	0	4	0	1	6	3	0	0	0	5	4
4	0	0	1	2	8	2	0	0	0	3	4
5	0	0	0	0	3	1	0	0	0	2	1
6	0	2	0	0	1	2	0	0	0	2	0
7	1	1	0	1	3	0	0	0	0	3	0
8	1	0	0	0	2	0	0	0	0	0	0
9	0	1	1	0	0	0	0	0	0	0	0
10	0	1	0	0	0	0	0	0	0	1	0
Total	5	11	5	6	26	12	2	2	1	18	12

and P15. P04 and P07 are very similar in form, the primary difference being that P07 points have narrower stems than P04. These three point types are consistently found in the upper levels of deposits.

XG7 consists of point types X06, X17 and X18. These three corner notched expanding stem points are very similar in form and very consistently occur in levels one through five of the mound. X06, X17 and X18 all have straight bases with sharp, pointed stem corners, or tangs. X06 has deep narrow notches. X17 and X18 have wide notches but X18 is generally smaller with less pointed tangs.

Group XG6 contains types X08 and X09, and is another group of expanding stem points with rounded stem corners. The stems of these points have distinctive rounded tangs. X08 points have deep narrow notches. X09 has smaller, narrower stems with wide curved notches. These points are consistently found in the upper levels of the deposit.

Contracting stem points were initially separated into 28 subgroups described in the previous section. These subgroups are based on very slight variations in stem and shoulder characteristics. This extensive subdivision was done in an attempt to identify changes in the contracting stem form through time. The primary characteristic that is considered is the shape of the stem. Three basic stem shapes are stems with pointed bases, stems with rounded bases, and stems with straight bases. A significant number of contracting stem points have bases that fall in between pointed and rounded. These are described above as types C09 through C12. A large number of contracting stem points have bases which are damaged too severely to assign them to any of these categories. The secondary factor that was used in subdividing contracting stem points are shoulder characteristics. There is a wide variation in the shoulder outlines of the contracting stem points ranging from barely discernible to pointed, with long, downward extending barbs. Table 10 shows the distribution of the contracting stem points. Column CG1 consists only of type C01 points which have straight, flat bases. Group CG2 consists of points with rounded, convex bases and includes types C02 - C08, C41 and C51. Group CG3 consists of points with bases

Table 10: Distribution of Contracting stem points

1-foot Level	CG1 C01	CG2 C02-C08	CG3 C09-C12	CG4 C13-C26	CG5 Misc	Totals
1	3	17	3	30	32	85
2	3	11	3	25	18	60
3	1	27	3	21	13	65
4	2	21	6	10	16	55
5	6	30	3	16	19	74
6	2	8	0	3	5	18
7	1	4	0	1	2	8
8	0	1	0	2	0	3
9	1	0	0	0	1	2
10	0	0	1	0	3	4
Totals	19	119	19	108	109	374

that are nearly pointed but still somewhat rounded. It is difficult to determine if these bases were intended to be rounded or pointed. Group CG3 includes types C09 - C12. Group CG4 consists of points with bases that are decidedly pointed and includes types C13 - C26. CG5 contains the miscellaneous type C, which all had damaged stems.

As noted previously, less than 5% of the contracting stem points occur below level six. Statistically, this representation is nearly insignificant and is potentially due to disturbance or the collection process. There are twice as many rounded base points as pointed base points at levels four, five and six. The number of rounded base points reaches a peak of 30 in level five and then decreases to 17 at level one. The number of pointed bases increases fairly consistently up to a peak of 30 at level one. In fact, the pattern of change in the frequency of pointed base points is nearly the opposite of the change of frequency of

rounded bases.

By comparing the frequencies of rounded and pointed bases through time, it could be postulated that when contracting stem points were first introduced, rounded bases were preferred over pointed bases. Over time, the preference shifted from rounded bases to pointed bases. The early preference for rounded bases could be challenged by recognizing that 29% of the sample, which is in group CG5, is not included. In levels one through seven, the number of points in CG5 ranges from 20% to 37% of the contracting stem points. This percentage fluctuates at each level from 20% to 30% and then hits a peak representation of 37% at level one. The frequency pattern of group CG5 is very similar to CG4, the pointed base group. It could be argued that the thin, fragile nature of the pointed base might cause these stems to break more easily than the more robust rounded stems causing these artifacts to be sorted into the miscellaneous category. If this is the case, and the miscellaneous group is added to the pointed base group, then the pointed base style dominates the entire sequence and reaches a peak of popularity of 73% at level one. In either case, the rounded stem form declines in usage after level five. This analysis of contracting stem points concurs with Schambach's(1982) only to the extent that the rounded stem points are preferred during earlier occupations and give way

to the preference for pointed stem points during later periods. However, no evidence exists in this collection that either style was abandoned at any time.

Specialized bifaces and preforms compose 13% of the sample. The tool categories defined here are based on macroscopic formal characteristics that suggest possible functional uses. Without microscopic use-wear analysis, however, many can only be described as miscellaneous or preforms. Table 11 illustrates the distribution of biface tools. The first column labeled 'axe/hoe' consists of the largest tools of the 'A' category. Scalpels, in the second column, consist of types B11 and B12. These have been named 'scalpels' because they are very thin and small, like prehistoric razor blades or fine cutting tools. Drills consist of artifacts with narrow, pointed ends, and are composed of types B16 and B17. B16 drills have contracting stems with no discernible shoulders and are reminiscent of modern drill bits. B17 drills are a mixed assortment of stemmed tools and heavy graver-like tools.

Tools referred to as 'knives' exhibit single-edge, or asymmetrical use wear and retouch. Knives consist of types B06 and B15. Type B06 are in this group because of asymmetrical edgewear and thinness. Some may have been used as side scrapers. Some of the B15 tools have hafting components and look like modified points.

Table 11: Distribution of Bifaces

1 foot level	Axe/ Hoe	Scalpel	Drill	Knife	Misc	Preform	Scraper	Total
1	2	4	3	2	4	3	2	20
2	7	3	1	4	1	3	3	22
3	3	3	3	3	3	1	1	17
4	1	3	3	4	2	5	1	16
5	1	0	0	3	4	8	0	16
6	0	0	3	1	0	1	0	5
7	0	0	1	1	1	0	1	4
8	0	0	0	2	0	0	0	2
9	0	0	1	1	0	0	0	2
10	0	0	0	0	0	0	0	0
Totals	14	13	15	21	15	21	8	107

End scrapers consist of types B02, B03 and B09. These tools have one end which is steeply beveled with associated use-wear characteristics. The preform column consists of types B01, B04, B05 and B08. These are all large bifaces with varying degrees of thinning, shaping and finishing. None have stems or notches but almost all have evidence of some edge damage. The miscellaneous column consists of types B07, B10, B13 and B14. Some of these may have been preforms, knives or scrapers.

The number of bifaces is very small in the deepest five levels but increases slowly from zero in level ten to five in level six. Between level five and six, a dramatic 220% increase occurs. This jump at level six corresponds to the increase in points which also occurs at level six, but is even more exaggerated.

Among these biface tools, only drills, knives, a scraper and one indeterminate biface are present below level six. The first preform appears at level six, the first hoe at level five, and the fine thin scalpel knives appear at level four. As the number of bifaces increases through time, so does the variety of bifaces. This proliferation of types and styles of tools represents an increase in specialization. The heavy axehead and the razor thin scalpel are very efficient tools for particular types of tasks, whereas large 'points' have been shown to be more versatile tools, suitable for a variety of tasks (Ahler 1971). The increase in specialization accompanies the overall increase in population and use of the site.

The dramatic increase in total materials between level six and five is also reflected in contracting stem points and specialized bifaces. This significant jump in quantities could be interpreted to reflect an increase in population or site usage or both. The associated increase in specialized bifaces may reflect a more sedentary lifestyle (Odell 1994).

Parallel and expanding stem points are the primary, and in some cases, the only, tools in the lower four to five levels of deposit. These tool forms represent some of the earliest occupations in eastern Oklahoma. Although the increases in parallel and expanding stem points are

significant during later periods, these increases pale in comparison to the three-fold increase in contracting stem points.

The spectacular increase in contracting stem tools and tools made of locally available quartzite at level five may reflect a change in technology rather than merely an increase in population or site usage. Tools enter an archaeological record as a result of discard and other processes (Shott 1989). Tools with shorter use-lives are discarded at an accelerated rate. Tools with lower manufacturing costs, particularly with respect to raw material availability and complexity of manufacture, have shorter use-lives (Bamforth 1986). When less time and effort are expended during manufacture, the tool is less valuable because replacement costs are low. Raw material, especially quartzite, is abundant in this area. Contracting stems are easier and quicker to make than most corner-notched or parallel stems. Their increasing numbers in the upper levels may reflect the fact that they had shorter use-lives, were less valuable, and more expendable than other types.

Ahler's (1971) functional analysis of projectile points indicates that, in general, contracting stem and contracting stemmed lanceolate points were probably bonded in their shafts and were used primarily as knives at Rodgers Shelter

in Missouri. Points used as projectiles were dominated by side-notched forms, which are presumably more stable on impact. Ahler also advocates the position that variation in point morphology may reflect the variation in tool function rather than varying culturally distinct inhabitants. Although Ahler warns against extrapolating his analysis of Rodgers Shelter to other sites, it does bring up intriguing questions about the contracting stem system of technology.

Contracting stems may also represent a technology system which is maintainable. Modular components, easily maintained by users, not specialized craftsmen, and poor workmanship are attributes of maintainable systems employed in a "forager" procurement strategy (Bleed 1986). Forager hunting strategies are described as opportunistic harvesting of game which is "continually available but on an unpredictable schedule" (Bleed 1986).

The development of the contracting stem method or system of tool manufacture may reflect a standardization of a modular component (Odell 1994). The contracting hafting element, when inserted into a split or bored shaft, may accommodate a wider range of shaft diameters. It is adjustable to the size of the shaft, or split, within a certain range, similar to a "one size fits all" concept.

Analysis of WPA Collection Process

One objective of this thesis is to examine the problems and research potential of the WPA collections. To evaluate the potential collection bias of the Mackey site and other WPA collections, comparisons are made with more recently excavated sites in the area. The Scott site was excavated in 1977 by the Archaeological Research and Management Center at the University of Oklahoma (Galm and Flynn 1978b). Because the Scott site is the deepest mound excavated in the area since the WPA era, artifact frequencies from the Scott site are compared with those from the Mackey site. Comparison with the Scott site is also useful in an attempt to assign relative dating to the Mackey site. Because the Wann site data (Galm and Flynn 1978b) is available in a similar format as Scott, it is also included in this comparative analysis.

The excavation unit at Scott is 1 X 1 X .1 meters. Since the excavation units from the two sites are different, in order to compare the sites, the excavation unit of the Mackey site is converted to metric units. Since 5 feet equals 1.52 meters, then 5 square feet equals 2.31 square meters. One foot equals .3 meters. Therefore, one square at Mackey is 2.31 times larger than a square at Scott, and one level at Mackey is three times as thick as a level at Scott.

The study sample from the Mackey site is from 142 5 X 5 feet squares, which is approximately equivalent to 328 1 X 1 meter squares. The Scott site excavation consists of 57 1 X 1 meter squares. Therefore the horizontal area of the Mackey site is 328 divided by 57, or 5.75 times as large as the Scott site area. In addition, the depth of the Scott site is two meters which is approximately equivalent to 6.67 feet, whereas the Mackey site extends to 12 feet in some areas.

Table 12 illustrates the comparison of some of the gross characteristics of these sites. Considering the large size of the Mackey site, some artifact frequencies are obviously out of proportion. The total number of artifacts, the small points, point and biface fragments and flakes seem to be underrepresented. Only the number of large points seems to be roughly proportional to the quantity of fill dirt. The bifaces are the only other category that approaches an acceptable representation. It is important to note that while modified flakes dominate the assemblages at Sott and Wann, they are poorly represented in the Mackey collection.

The underrepresentation of certain classes of artifacts at the Mackey site is due to the collection process. The failure to screen fill dirt is the probable cause of the low frequencies of small points and flakes, although "pot-

Table 12: Comparison of Site Data

	Mackey	Scott	Wann
Surface Area	328	57	66
Depth (ft) (cm)	9 270	6 180	3 90
Total Artifacts	820	2403	2576
Large Points	651	244	312
Small Points	3	25	68
Point Fragments	43	620	511
Bifaces	109	127	203
Biface Fragments	0	608	643
Modified Flakes	14	779	818

hunting", or arrowhead collecting may explain the loss of small points near the surface. The few point fragments, bifaces and biface fragments are probably due to the excavation teams' failure to recognize those as artifacts. This failure is a reflection of state of the science of archaeology at the time as well as the skill level of the WPA workers. The fact that the number of large points in the collection approaches a proportional quantity, whereas the other artifacts do not, gives the impression that the excavation crews selected artifacts that looked familiar, like arrowheads. Larger artifacts are also more easily seen when digging with a shovel, which was a standard procedure

of the WPA crews.

Another observation about the collection process that affected this sample is the duration of the project. The excavation of the mound at Mackey was begun at the end of May in 1940 and the final report on the site is dated September 30, 1940 (Newkumet 1940b). The site was excavated very quickly, in less than four months. The excavation of such a large quantity of dirt containing so many burials in only four months might naturally result in some collection bias.

Chapter 4

Interpretation

Cultural Chronology

Defining cultural components for a site as large and complex as Mackey without absolute dating and without obvious stratigraphic information is an awesome task and requires relentless attention to detail. Additionally, as was demonstrated in the previous section, we can be fairly certain that the collection is biased in favor of large hafted bifaces. The sample for this study was selected from squares without burials in the anticipation that stratigraphic sequences would be more evident in soil less disturbed. The cultural chronology presented is based on vertical location of general clusters of diagnostic tool types at Mackey and comparison of these tools with those at other sites in the region. The main tools in this analysis are large hafted bifaces, simply because of their overwhelming numbers.

The following discussion of Early and Middle Archaic components is partly based on comparison with the nearby Scott site which is dated as early as 2550 B.C. +/-270 (UGa-1970). This date is in the upper range of the Middle Archaic period (Galm 1984). Nearly all of the points from the Early and Middle Archaic components at Mackey are absent

from the Scott site. The Mackey midden is nearly four feet deeper than the deepest level at Scott. It is precisely in these lowest four to five levels of Mackey where the Early and Middle Archaic components are found. Examples of Early and Middle Archaic artifacts are also found in the deepest levels at the Sam site (Proctor 1957) and the Copeland site (Guilinger 1971).

In reviewing the preceding tables of distributions of point types, it is important to be aware of a general characteristic of the mound itself. The mound was excavated down to underlying rock and clay. The mound was situated along the edge of a ravine which slopes down toward a creek. The excavation squares along the west, north and east edges are shallower than the squares in the middle. The profiles of the mound are similar in shape to a shallow bowl.

The effect of this bowl shape in the vertical distributions is that some artifacts may appear to be in the upper levels of deposit when they are, in fact, at the base of the deposit. This condition is referred to frequently in the discussion of the older, and deeper, artifacts. This problem can be minimized by adjusting the level data for the lower levels of deposit. Table 13 illustrates the distributions of the artifacts in the lower levels after the level data are adjusted by a simple algebraic inversion algorithm (deepest level of square - level +1). In this

Table 13: Level adjusted distributions of parallel and expanding stem points

Layer	PG1	PG2	PG3	PG4	PG5	XG1	XG2	XG3	XG4	XG5	X07
10	0	0	0	0	0	0	0	0	0	0	0
9	0	0	1	1	0	1	2	0	1	0	0
8	0	0	1	1	0	0	1	0	0	1	0
7	1	0	1	1	0	0	0	1	0	0	0
6	0	1	2	2	0	2	1	0	0	0	1
5	0	2	0	1	0	1	0	1	0	1	0
4	1	0	0	1	0	1	2	2	0	0	0
3	4	2	6	2	1	0	3	3	1	2	1
2	6	4	10	1	2	3	4	3	4	1	1
1	11	5	6	2	1	8	11	6	3	5	4

table, the term, "layer", refers to the stratigraphic unit relative to the bottom of the square, with layer one being the oldest. This is in contrast to the standard term, "level", which refers to the imposed stratigraphic position relative to the surface. This technique facilitates the recognition of stratigraphic relationships of older artifact forms.

Table 13 shows more clearly the consistent distribution of many of the parallel and expanding stem point groups. However, the technique is inappropriate to use for artifacts that are consistently in the upper levels of deposit.

Early Archaic

Evidence of Early Archaic occupations includes 23 large parallel stem points in PG1, three Dalton-like points of type X30, two triangular, side notched points of type X24

and 15 points in types X07, X23 and X26. Of these, the Dalton point is a type which is often diagnostic of Early Archaic occupations in this area (Galm and Hofman 1984, Wyckoff 1984). A single classic Dalton point, by itself, at level eight could be a curated or collected item. However, other artifacts at the deepest levels have been associated with Dalton points at other sites.

The Billy Ross site (Galm and Hofman 1984) in Haskell County, about 30 miles northwest of Mackey, contains an Early Archaic component with parallel stem points similar to those in group PG1. Many points of type P01 and P03 are large lanceolate points with small or sloping shoulders like Category 10 of the Billy Ross site. These lanceolate points are comparable to the Cody, Alberta or Scottsbluff types of the Plains. In contrast, type P02 and some of type P01 points have well defined shoulders and barbs. These barbed points are similar to Bulverde in outline, but they are larger than most other points described as Bulverde (Bell 1960).

The X30 biface pictured in Figure 22g is nearly identical to a reworked Dalton-like tool from the Billy Ross site (see Galm and Hofman 1984: Figure 8c). Type X24 is very similar to the Big Sandy types described at the Billy Ross site and the Packard site (Wyckoff 1964, 1985). A Big Sandy point from the Packard site is dated at 9416 +/-193

B.P. (NZ-478), and a Dalton point was recovered in the zone just above.

The Albertson site in northwest Arkansas (Dickson 1991) is a deeply stratified site with an Early Archaic component containing Rice bifaces which are very similar to types X07, X23 and X26. The Rice occupation at the Albertson site is associated with a date of 8410 +/-245 B.P. (UGa-3939).

Additional evidence for the existence of an Early Archaic component at Mackey can be deduced by extrapolating the deposition rate. The Scott site date of 2550 B.C. (4500 B.P.) (Galm 1981) is associated with the dominance of contracting stem points at level 6 (50 - 60 cm). The dominance of contracting stem points at Mackey also begins at level 6 (5 - 6 feet). If a continuous rate of deposition throughout is assumed, and this rate is extrapolated to the lower four feet, then the lower four feet would have required 2000 to 3000 years to accumulate. This would set the lower limit at Mackey to 5550 B.C., which is generally accepted to be the beginning of the Middle Archaic. However, this extrapolation is conservative, given our belief that population density and site utilization were less intense and more intermittent during the earlier phases in the area. The rate of deposition at the lower levels should be slower than during the later time period. Acknowledging this conservative extrapolation, it is

reasonable to infer that the earliest occupations of Mackey occurred some time during the Early Archaic period.

Middle Archaic

The Middle Archaic component consists primarily of parallel and expanding stem points. These include groups PG2, XG1, XG2, XG4 and XG5, and unique types X22, X25, X27, X29 and X40.

Group PG2 contains a Calf Creek point and types P08, P10 and P11 which have bases similar to Calf Creek. Groups XG2 and XG5 and types X27 and X40 are similar to points frequently found in association with Calf Creek points in Oklahoma (Wyckoff and Shockey 1993, 1994). X27 is a distinctive Cossatot River point and group XG2 and X40 are frequently typed as Cossatot River points as well (Wyckoff and Shockey 1993, 1994). The Calf Creek horizon was dated at 5730 +/- 160 B.P. (Wyckoff et. al. 1993) at the Arrowhead Ditch site in Muskogee County.

Group XG4 and type X22 are larger expanding stem bifaces. Type X13 in group XG4 consists of points which are very similar to the Calf Creek group but are significantly larger. Types X01, X02, X03 and X31 are similar to points of the Trinity aspect at the Beaver site (Wyckoff 1984) which is believed to be another Middle Archaic assemblage. Type X25 are similar to Johnson points, which are associated

with Middle Archaic assemblages in this area (Wyckoff 1984). A number of parallel and expanding stem artifacts in this collection are similar to those described for the Tom's Brook complex (Wyckoff 1984).

The earliest assemblage at the Scott site is from the Middle Archaic period (Galm 1981). The Middle Archaic component at Scott is characterized as pre-ceramic with contracting stem and straight (parallel) stem points dominating the lithics. This description is very similar to what is found at level six at Mackey. In level six there are almost the same number of contracting stem points as parallel stem points. The relationship of frequencies of general point categories in level six at Mackey is nearly identical to levels 13-15 at Scott, which is four to five feet below the surface.

The Middle Archaic phase in Galm's (1981) model spans a very long period of time, 4500 years. The assemblages at the Mackey site show that this phase can be broken down into at least two sub-phases. The earliest sub-phase is characterized by the Calf Creek horizon materials and an absence of contracting stem points. The later sub-phase is defined by the introduction of the contracting-stem point, which eventually becomes one of the most important lithic traditions of the area.

Late Archaic

Late Archaic, Wister phase, artifacts are predominantly contracting stem points. As stated earlier, contracting stem points are present throughout the deposits, but the few that occur below level six are probably intrusive. Other point types in the Late Archaic component are X28, which resembles the Martindale type, P13, which are similar to the Marshall type, and parallel stem point types of group PG4.

Type X19, which is made from John's Valley flint, closely resembles the Motley point, which is common in Poverty Point Late Archaic assemblages. From 75% to 80% of the Motley points at Poverty Point are made from exotic flints imported from southeastern Oklahoma, Tennessee and Ohio (Webb 1977). The single specimen in this collection may be a representative sample of the end product made from the high-grade materials which were exported south.

Wister Phase assemblages at Scott and Wann (Galm 1981) are pre-ceramic and are dominated by contracting stem points and a variety of chipped stone implements. This corresponds to the assemblage in level five at Mackey. The sudden increase in contracting stem points and variety of specialized bifaces, especially preforms, that occurs at level five is very similar to the assemblage at Scott that occurs approximately four feet below the surface. This phase is also associated with change toward an overwhelming

preference for local quartzite at Mackey. The first of the large single-bitted axes or hoes appears during the middle of this phase at Mackey just as it does at Scott.

Southern Woodland: Fourche Maline Phase

Although contracting stem points dominate, several parallel and expanding stem points are present in late Archaic deposits and continue through Woodland and later periods. These include groups XG6, XG7 and PG4. Group XG6 contains types X08 and X09, which are the largest of the expanding stem points that occur in the upper levels. These types, X08 and X09, have rounded tangs. Points in group XG7 are smaller than XG6 and have flared, pointed tangs. Group PG4 points are similar to Calf Creek types but have generally smaller stems and lack the long barbs.

Galm's (1981) model associates the Fourche Maline phase with the introduction of pottery. This occurs at level four at Mackey (Table 14). Although some potsherds are found below level four at Mackey, most of these are probably intrusive. During this phase, at level four, the variety of specialized bifaces increases again with the introduction of the fine scalpel-like cutting tool. The double-bitted axe appears during the later part of this phase in level two. This unique implement first appears at Scott between 20 to 30 centimeters below the surface (Galm and Flynn 1978b).

Table 14: Squares that contain pottery

Level	Squares containing burials	Squares containing no burials	Total
1	43	81	124
2	17	42	59
3	8	17	25
4	3	7	10
5	2	2	4
6	0	1	1
7	0	1	1
8	0	0	0
9	0	0	0
10	0	1	1
Totals	73	152	225

The decline in frequency of formal tools at level four and the subsequent leveling out of tool frequency in overlaying deposits may reflect a change in technology during the Fourche Maline phase involving the adoption of expedient technology. Parry and Kelly (1987) describe a shift in technology from standardized core to expedient core occurring in the eastern woodlands from 500 - 900 A.D. and in the plains and Caddo area sometime after A.D. 300.

The absence of expedient tools, i.e. unmodified flake tools, in the Mackey collection is probably due to the collection process. If the flake tools had been collected then we might see an increase in artifacts instead of a decrease indicating a similar shift in technology at Mackey.

Habiukut Period

Points which are only found in deposits post-dating the

introduction of pottery are X05 and X21. X05 are the only small arrow points in the sample. They resemble the Scallorn type which is frequently associated with Woodland and later occupations.

Aside from these examples, the assemblage of artifacts cannot be distinguished from those beginning during the Fourche Maline phase. Phases of the Habiukut Period are identified on the basis of ceramic types and small point types (Galm 1978b). Because these diagnostics are essentially unavailable for this study, no further breakdown of this period is postulated here.

Beginning at approximately level five, the artifacts at Mackey are very similar to those at Scott. Because of the many problems with the Mackey collection and provenience information, it is assumed that the cultural chronology of these upper levels is like that defined at Scott. No further refinement can be achieved with this analysis.

Summary and Conclusions

The analysis of this collection is affected significantly by the collection process. Compared to other similar middens in the area, every category of chipped stone artifact seems to be underrepresented. Different stages of

tool manufacture are present but only in small numbers and there is no debitage. The collection bias is in favor of large and medium size points. In addition, the large provenience units reduce the accuracy of the definitions of stratigraphic components.

The deposits are mixed but not to a great extent. For example, less than 5% of the contracting stem points can be considered truly intrusive in the lower levels. There are many other consistencies in vertical distributions of artifact types, including pottery (see Table 14). In spite of the obvious biases inherent in the collection, the massive size of the midden and the wealth of artifacts provide a sufficiently large sample so that the margin of error is minimal.

The study of the Mackey site increases our knowledge of the Fourche Maline area. Diagnostic artifacts from the lower levels of deposit indicate occupations of the area during the Early and Middle Archaic periods. Until this study, the earliest known stratified components in this valley are at the Scott site. The three to four feet of additional deeper deposits provide a significant variety of parallel stem and expanding stem diagnostic points that predate the Scott materials.

The riverine environments of eastern Oklahoma are rich in biological and geological resources, and were exploited

intensively as early as the Middle Archaic period. Mackey was a heavily favored campsite during the Early and Middle Archaic periods. Low frequencies of artifacts in the lower midden deposits attest to short term periodic occupations. The earliest components are dominated by large parallel stem points and medium sized side notched points. Even early expanding stem points are only slightly expanding. These artifacts are very similar to the styles found in Early Archaic components of the southeastern Woodlands.

It is proposed that the Middle Archaic period can be subdivided into phases. Early Middle Archaic materials resemble those associated with the Calf Creek horizon (Wyckoff 1994). These materials occur in the lowest deposits and generally overlap with the earlier artifacts. However, the Middle Archaic materials extend further into the upper deposits than the Early Archaic materials.

Large contracting stem points, which normally dominate sites in the Fourche Maline valley, are introduced during the upper levels of the Middle Archaic period. They dominate the sample starting at about level five. Although rounded base and pointed base forms occur simultaneously and could not be separated by level, an early preference for rounded base forms is implicated. This gives way to the preference for pointed bases during later prehistoric periods.

Roughly around the middle of the deposits, between levels five and six, a drastic change occurs in the use of the site. This change marks the beginning of late Archaic occupations. A simultaneous increase in the total number of artifacts, the preference for contracting stem forms and the preferred use of local quartzite mark the beginning of an overall change in technology and site occupation that continued until late in prehistory. After this change occurs, pottery is introduced.

This change may correspond to a more sedentary settlement pattern and population increase. It has been postulated that a sedentary lifestyle along with abundant availability of high quality lithic resources will result in an expedient lithic technology (Andrefsky 1994). Although highly expedient tools such as flake tools are too infrequent in this collection to evaluate, it is proposed that contracting stem tools are more expedient, easier to make and use, than most of the other forms in this collection. It is also plausible that the pointed base forms became more popular because they are even simpler to make and haft than the rounded base form.

Another explanation is that the contracting stem point was a standardized modular component in a maintainable system of hunting technology. This explanation supports the interpretation that the Mackey site was a base camp, from

which foraging expeditions were launched. These propositions would, at least partially, explain the explosion of interest in contracting stems during the Woodland and later periods of permanent and semi-permanent occupations in this region.

Some smaller types of parallel and expanding stem points persist through late prehistoric periods. These points are generally similar to those found at Scott and other sites in the area. Large specialized tools such as axes and hoes begin at level five. Other specialized bifaces are found in lower deposits. Pottery is introduced between levels four and five.

Abundant availability of lithic raw material was one of the factors responsible for the popularity of this area. However, throughout the deposits there is a persistent presence of lithic materials originating in the area in and around the Ozark Mountains in spite of the ready availability of high quality materials in the immediate area. The use of Ozark materials does not seem to correspond with other variables such as tool form or size. The consistent use of Ozark raw material and similar artifact forms indicate important contacts, either through trade or mobility, with areas to the north, and the development of the Spiro Mound complex may have been a cumulative result of these contacts.

The Mackey site provides a good example of the character of the transition from Archaic pre-pottery occupations to the more intensive, sedentary occupations of the Woodland stage. In consideration of the deep deposits representing Early and Middle Archaic occupations and the ability to separate those occupations from later Archaic and Woodland period levels at this site, it is recommended that the remaining materials from the Mackey site be studied and a composite site report completed. It is believed that such a report would add an important component to our knowledge of the prehistory of eastern Oklahoma.

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Appendix A

Description of Artifact Database

Record Layout

Column	Variable Name	Description
1-4	CATNUM	Base catalog number, each provenience unit(row*alley*level) has a unique number.
6-7	CATSUB	Catalog number subscript, each artifact has a unique number.
10-11	ROW	Row, south to north site coordinate, 5 foot units.
13-14	ALLEY	Alley, west to east site coordinate, 5 foot units.
17-18	LEVEL	Level, vertical coordinate, 1 foot units.
21	BURFLAG	Burial flag, values: N = no burial in this square
24	CERFLAG	Ceramic flag, values: N = no ceramics in this square C = ceramics in this square O = this square overlays a unit containing ceramics U = this square is under a unit containing ceramics
26	MATGRP	Material group, values: A = type A chert B = type B chert C = clear or white quartz G = gray Boone chert H = brown layered Hematite M = sandstone and slate N = Arkansas novaculite Q = quartzite R = argillite S = greystone W = white Boone chert
27-28	MATTYPE	Material type, each type consists of materials that are nearly identical in appearance, values are 01 - 29.
30	TOOLGRP	Tool group, values are: A = axe or hoe B = miscellaneous bifaces C = contracting stem point F = flake/uniface P = parallel stem point T = blade or tip fragment X = expanding stem point
31-32	TOOLTYP	Tool type; subcategory of TOOLGRP.

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
0521.	01	03	02	N	N	W01	C	02
0522.01	01	04	02	N	N	Q26	X26	02
0522.02	01	04	02	N	N	W02	C22	02
0523.	01	05	01	N	N	W01	C18	02
0524.01	01	05	02	N	N	W01	X04	02
0524.02	01	05	02	N	N			02
0525.01	01	06	01	N	N	Q26	C	07
0525.02	01	06	01	N	N	Q26	C22	07
0525.03	01	06	01	N	N	Q17	C	07
0525.04	01	06	01	N	N	Q07	X21	07
0526.01	01	06	02	N	N	G10	P07	07
0526.02	01	06	02	N	N	B82	X01	07
0526.03	01	06	02	N	N	Q07	C09	07
0526.04	01	06	02	N	N	Q11	B15	07
0527.01	01	06	05	N	N	S08	X16	07
0527.02	01	06	05	N	N	Q17	C	07
0528.01	01	06	07	N	N	W02	X10	07
0528.02	01	06	07	N	N	Q07	P01	07
0529.01	01	07	01	N	C	Q07	C	05
0529.02	01	07	01	N	C	A25	B11	05
0529.03	01	07	01	N	C	Q11	C02	05
0530.01	01	07	02	N	U	G12	T	05
0530.02	01	07	02	N	U	G12	C	05
0531.01	01	07	03	N	U	Q07	X40	05
0531.02	01	07	03	N	U	W02	C26	05
0531.03	01	07	03	N	U	Q07	C	05
0531.04	01	07	03	N	U	G92	X32	05
0531.05	01	07	03	N	U	W02	C26	05
0532.01	01	07	04	N	U	A28	P05	05
0532.02	01	07	04	N	U	Q07	C	05
0533.01	01	07	05	N	U	B82	C03	05
0533.02	01	07	05	N	U	B82	B15	05
0533.03	01	07	05	N	U	Q07	C14	05
0534.01	01	08	01	N	C	Q07	C06	04
0535.01	01	08	02	N	U	G12	X03	04
0536.01	01	08	04	N	U	B22	C	04
0536.02	01	08	04	N	U	G10	C51	04
0554.01	01	12	03	N	U	Q07	C07	05
0554.02	01	12	03	N	U	Q07	C08	05
0555.01	01	12	04	N	U	Q17	P14	05
0555.02	01	12	04	N	U	Q07	X06	05
0555.03	01	12	04	N	U	Q07	P06	05
0556.01	01	12	05	N	U			05
0556.02	01	12	05	N	U	N15	X29	05
0556.03	01	12	05	N	U	N15	C02	05
0557.01	01	13	01	N	C			08
0557.02	01	13	01	N	C	Q07	C15	08
0558.	01	13	02	N	C	Q07	C	08
0559.	01	13	03	N	U	Q07	P14	08
0560.01	01	13	04	N	U	Q11	C08	08

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
0560.02	01	13	04	N	U	Q23	C16	08
0560.03	01	13	04	N	U	Q17	B15	08
0560.04	01	13	04	N	U	A16	C	08
0561.	01	13	05	N	U	Q07	C18	08
0562.01	01	13	06	N	U	S08	C01	08
0562.02	01	13	06	N	U	B82	P11	08
0564.01	01	13	08	N	U	W01	X07	08
0564.02	01	13	08	N	U	G09	X04	08
0571.	01	15	01	N	C	W01	C23	08
0572.01	01	15	02	N	O	Q07	X08	08
0572.02	01	15	02	N	O	Q26	X10	08
0574.	01	15	04	N	U	Q07	C12	08
0575.	01	15	05	N	U	Q26	P02	08
0576.	01	15	06	N	U			08
0577.	01	15	07	N	U	Q17	C	08
0578.	01	15	08	N	U	N15	P16	08
0580.01	01	16	02	N	U	W01	C11	09
0580.02	01	16	02	N	U	Q07	X03	09
0581.01	01	16	04	N	U	Q07	C14	09
0581.02	01	16	04	N	U	B22	F	09
0582.	01	16	05	N	U	Q17	C08	09
0584.	01	16	09	N	U	W19	X04	09
0599.01	01	19	03	N	U	N15	C51	07
0599.02	01	19	03	N	U	Q26	C12	07
0600.01	01	19	05	N	U	W02	X07	07
0601.01	01	19	06	N	U	Q07	X11	07
0602.01	01	19	07	N	U	W19	X40	07
0602.02	01	19	07	N	U	Q06	X26	07
0603.01	01	20	02	N	N	W01	C05	08
0604.	01	20	03	N	N	G09	P08	08
0607.01	01	20	05	N	N	N15		08
0607.02	01	20	05	N	N	C14		08
0607.03	01	20	05	N	N	C14		08
0608.01	01	20	07	N	N	Q07	C07	08
0608.02	01	20	07	N	N	Q07	X14	08
0608.03	01	20	07	N	N	Q07	B06	08
0609.	01	20	08	N	N	Q07	B15	08
0617.01	01	22	01	N	C	B82	X05	06
0617.02	01	22	01	N	C	G92	C	06
0619.01	01	22	03	N	U	Q26	X06	06
0619.02	01	22	03	N	U	B82	X14	06
0620.01	01	22	04	N	U	Q07	T	06
0620.02	01	22	04	N	U	Q26	T	06
0620.03	01	22	04	N	U	A16	P07	06
0620.04	01	22	04	N	U	B82	P06	06
0621.01	01	22	06	N	U	B21	C26	06
0622.01	01	23	02	N	N	N15	X06	08
0622.02	01	23	02	N	N	G12	C	08
0622.03	01	23	02	N	N	Q26	C23	08
0622.04	01	23	02	N	N	W01	C23	08

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
0622.05	01	23	02	N	N	G12	B15	08
0623.01	01	23	03	N	N	Q26	X14	08
0624.01	01	23	04	N	N	Q26	C10	08
0624.02	01	23	04	N	N	Q07	C10	08
0624.03	01	23	04	N	N	Q07	B01	08
0624.04	01	23	04	N	N	G12	B06	08
0624.05	01	23	04	N	N	Q11	B02	08
0624.06	01	23	04	N	N	B21	C05	08
0625.01	01	23	07	N	N	B82	P14	08
0625.02	01	23	07	N	N	Q23	P06	08
0625.03	01	23	07	N	N	A28	X16	08
0626.01	01	23	08	N	N	C14	[illegible]	08
0627.01	01	24	02	N	C	Q07	C [illegible]	05
0627.02	01	24	02	N	C	Q11	X10	05
0627.03	01	24	02	N	C	A16	C26	05
0627.04	01	24	02	N	C	M13	A04	05
0627.05	01	24	02	N	C	M13	A03	05
0628.01	01	24	03	N	U	Q11	X08	05
0628.02	01	24	03	N	U	S08	C	05
0628.03	01	24	03	N	U	Q23	C [illegible]	05
0628.04	01	24	03	N	U	Q07	B01	05
0628.05	01	24	03	N	U	Q11	C19	05
0629.01	01	24	04	N	U	G12	C07	05
0630.01	01	24	05	N	U	Q07	C	05
0631.01	02	02	01	N	C	G12	B17	02
0632.01	02	02	02	N	U	Q07	X02	02
0633.01	02	03	01	N	C	G10	X [illegible]	01
0634.01	02	04	01	N	N	Q07	C [illegible]	01
0634.02	02	04	01	N	N	C14	[illegible]	01
0635.01	02	05	01	N	N	Q26	B15	02
0635.02	02	05	01	N	N	W02	C	02
0636.02	02	05	02	N	N	Q07	X01	02
0637.01	02	06	01	N	N	Q07	C	05
0637.02	02	06	01	N	N	G10	C04	05
0638.01	02	06	02	N	N	W01	T [illegible]	05
0638.02	02	06	02	N	N	G12	C41	05
0639.01	02	06	04	N	N	W01	B11	05
0640.01	02	06	05	N	N	Q07	P15	05
0664.01	02	11	02	N	N	Q06	C21	08
0665.01	02	11	03	N	N	Q07	F [illegible]	08
0666.01	02	11	04	N	N	A30	C26	08
0666.02	02	11	04	N	N	G10	X09	08
0667.01	02	11	05	N	N	H18	C [illegible]	08
0669.01	02	11	08	N	N	Q17	P01	08
0669.02	02	11	08	N	N	W01	X07	08
0670.01	02	12	03	N	N	Q07	X09	07
0670.02	02	12	03	N	N	Q07	C08	07
0670.03	02	12	03	N	N	B22	B12	07
0672.01	02	12	05	N	N	B22	B13	07
0672.02	02	12	05	N	N	N15	C51	07

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
0709.01	02	21	05	N	N	Q07	C02	06
0709.02	02	21	05	N	N	Q07	C17	06
0710.01	02	21	06	N	N	B22	C01	06
0711.01	02	22	01	N	C	Q07	T	08
0711.02	02	22	01	N	C	Q07	X32	08
0711.03	02	22	01	N	C	Q07	C01	08
0712.01	02	22	03	N	U	Q07	B10	08
0712.02	02	22	03	N	U	Q07	C41	08
0712.03	02	22	03	N	U	Q07	T	08
0712.04	02	22	03	N	U	G03	X07	08
0712.05	02	22	03	N	U	Q07	X06	08
0712.06	02	22	03	N	U	G12	C24	08
0713.01	02	22	05	N	U	B22	C41	08
0713.02	02	22	05	N	U	G12	C21	08
0713.03	02	22	05	N	U	Q07	B08	08
0718.01	02	23	04	N	U	Q07	X31	08
0718.02	02	23	04	N	U	A16	C	08
0718.03	02	23	04	N	U	Q07	C41	08
0719.01	02	23	05	N	U	Q07	C	08
0719.02	02	23	05	N	U	A30	B15	08
0720.01	02	23	06	N	U	B21	C06	08
0720.02	02	23	06	N	U	Q07	C06	08
0722.01	02	24	01	N	C	Q07	C10	05
0722.02	02	24	01	N	C	Q07	C	05
0723.01	02	24	02	N	U	R29	A04	05
0724.01	02	24	03	N	U	Q23	P15	05
0724.02	02	24	03	N	U	W02	C22	05
0724.03	02	24	03	N	U	Q07	X08	05
0725.01	02	24	04	N	U	G03	X18	05
0725.02	02	24	04	N	U	Q07	T	05
0725.03	02	24	04	N	U	A30	F	05
0725.04	02	24	04	N	U	W02	T	05
0726.01	02	24	05	N	U	G09	C	05
0726.02	02	24	05	N	U	Q26	C	05
0732.01	03	10	01	N	C	Q17	X05	06
0733.01	03	10	02	N	O	A16	C	06
0735.01	03	10	06	N	U	Q17	P01	06
0735.02	03	10	06	N	U	W01	X15	06
0741.01	03	12	02	N	N	N15	P14	08
0743.01	03	12	08	N	N	W02	X02	08
0776.01	03	20	02	N	O	Q17	B03	06
0779.01	03	20	05	N	U	W02	C	06
0780.01	03	20	06	N	U	Q26	B04	06
0784.01	04	09	01	N	N	B21	P06	08
0784.02	04	09	01	N	N	A25	C41	08
0784.03	04	09	01	N	N	G09	X28	08
0786.01	04	09	06	N	N	Q07	X09	08
0787.01	04	09	08	N	N	G03	X04	08
0790.01	04	11	03	N	N	A16	T	03
0790.02	04	11	03	N	N	B21	T	03

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
0790.03	04	11	03	N	N	Q17	C06	03
0790.04	04	11	03	N	N	A16	C08	03
0790.05	04	11	03	N	N	Q07	C	03
0791.01	04	12	02	N	N	Q11	C21	02
0791.02	04	12	02	N	N	B82	X06	02
0795.01	04	14	01	N	N	N15	P	08
0813.01	04	21	04	N	N	B82	C	08
0814.01	04	21	07	N	N	G12	P17	08
0821.01	05	10	02	N	N	Q07	C19	08
0824.01	05	10	06	N	N	G12	C	08
0825.01	05	10	08	N	N	Q07	F	08
0827.01	05	11	03	N	U	B82	B11	06
0829.01	05	11	05	N	U	Q07	C06	06
0830.01	05	11	06	N	U	W02	X01	06
0838.01	05	14	01	N	N	G12	C22	07
0840.01	05	14	06	N	N	B82	B16	07
0841.01	05	15	01	N	O	Q07	C	08
0841.02	05	15	01	N	O	Q07	C	08
0843.01	05	15	03	N	U	A30	C	08
0844.01	05	15	08	N	U	A16	X03	08
0844.02	05	15	08	N	U	G10	X03	08
0867.01	05	20	02	N	U	Q07	X14	06
0867.02	05	20	02	N	U	Q07	C26	06
0868.01	05	20	03	N	U	W01	C23	06
0872.01	05	21	06	N	U	W02	C04	07
0872.02	05	21	06	N	U	W02	B17	07
0873.01	05	21	07	N	U	Q17	X09	07
0873.02	05	21	07	N	U	Q17	P10	07
0874.01	05	22	03	N	O	Q07	P15	04
0877.01	06	10	03	N	N	Q07	X17	09
0877.02	06	10	03	N	N	B82	C	09
0878.01	06	10	07	N	N	G12	C19	09
0878.02	06	10	07	N	N	A20	P05	09
0879.01	06	10	09	N	N	N15	P01	09
0880.01	06	11	02	N	N	G92	B07	07
0881.01	06	11	04	N	N	Q07	X26	07
0883.01	06	11	07	N	N	Q17	T	07
0883.02	06	11	07	N	N	Q17	P13	07
0883.03	06	11	07	N	N	C14		07
0884.01	06	12	05	N	N	B82	P08	07
0885.01	06	12	06	N	N	W02	X14	07
0885.02	06	12	06	N	N	Q17	X11	07
0887.01	06	13	02	N	N	Q07	C08	08
0887.02	06	13	02	N	N	Q17	C01	08
0887.03	06	13	02	N	N	G10	X	08
0888.01	06	13	03	N	N	Q07	T	08
0889.01	06	13	07	N	N	W01	X01	08
0897.01	06	16	04	N	N	Q17	C07	10
0898.01	06	16	09	N	N	Q07	P02	10
0899.01	06	16	10	N	N	Q26	X11	10

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
0899.02	06	16	10	N	N	A16	C09	10
0899.03	06	16	10	N	N	W19	T	10
0904.01	06	18	02	N	N	Q17	C03	08
0904.02	06	18	02	N	N	W02	C05	08
0905.01	06	18	03	N	N	A28	B07	08
0906.01	06	18	04	N	N	Q07	C14	08
0907.01	06	18	05	N	N	C14		08
0918.01	06	21	02	N	N	Q07	B01	08
0920.01	06	21	08	N	N	Q26	X11	08
0921.01	06	22	01	N	O	Q17	C02	10
0921.02	06	22	01	N	O	B21	C26	10
0921.03	06	22	01	N	O	Q26	C01	10
0922.01	06	22	02	N	C	Q07	C13	10
0925.01	06	22	05	N	U	H18	B10	10
0925.02	06	22	05	N	U	Q07	C	10
0926.01	06	22	06	N	U	Q07	C08	10
0926.02	06	22	06	N	U	A16	C07	10
0926.03	06	22	06	N	U	Q07	P07	10
0926.04	06	22	06	N	U	A28	F	10
0926.05	06	22	06	N	U	A28	F	10
0927.01	06	22	07	N	U	Q07	C06	10
0928.01	06	22	09	N	U	Q07	P01	10
0929.01	06	22	10	N	U	W01	X08	10
0932.01	06	23	03	N	U	Q17	C	12
0934.01	06	23	05	N	U	A16	C	12
0934.02	06	23	05	N	U	Q07	B06	12
0935.01	06	23	06	N	U	A16	C06	12
0935.02	06	23	06	N	U	Q07	C02	12
0946.01	07	10	01	N	N	Q07	B02	10
0946.02	07	10	01	N	N	Q26	C41	10
0946.03	07	10	01	N	N	W01	C04	10
0946.04	07	10	01	N	N	Q07	B12	10
0948.01	07	10	04	N	N	W01	B16	10
0949.01	07	10	05	N	N	W01	X01	10
0950.01	07	10	07	N	N	B82	X10	10
0952.01	07	10	09	N	N	W01	X02	10
0952.02	07	10	09	N	N	W01	B16	10
0953.01	07	10	10	N	N	B82	X	10
0960.01	07	12	03	N	N	Q07	C51	09
0961.01	07	12	04	N	N	W02	C41	09
0961.02	07	12	04	N	N	Q17	C08	09
0962.01	07	12	08	N	N	N15	P06	09
0963.	07	12	09	N	N			09
0965.01	07	13	02	N	U	Q11	C02	08
0967.01	07	13	04	N	U	A20	F	08
0968.01	07	13	05	N	U	Q07	X09	08
0968.02	07	13	05	N	U	Q07	T	08
0968.03	07	13	05	N	U	G12	C41	08
0968.04	07	13	05	N	U	G10	X03	08
0968.05	07	13	05	N	U	G10	C51	08

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
0969.01	07	13	07	N	U	A16	X09	08
0970.01	07	13	08	N	U	W19	X27	08
0982.01	07	16	05	N	U	B21	C06	10
0983.01	07	16	07	N	U	Q07	P13	10
0984.01	07	17	01	N	O	Q07	X40	09
0986.01	07	17	08	N	U	G09	X07	09
0986.02	07	17	08	N	U	N15	P01	09
0987.01	07	17	09	N	U	B82	C	09
0987.02	07	17	09	N	U	Q07	P01	09
0988.01	07	18	02	N	C	Q07	C14	10
0988.02	07	18	02	N	C	Q07	T	10
0989.01	07	18	03	N	U	Q07	C19	10
0991.01	07	18	09	N	U	G09	X22	10
0991.02	07	18	09	N	U	Q07	X24	10
0992.01	07	18	10	N	U	B82	C	10
0992.02	07	18	10	N	U	Q07	C	10
0992.03	07	18	10	N	U	B21	X15	10
0992.04	07	18	10	N	U	Q07	P01	10
0993.01	07	19	02	N	C	A20	F	10
0994.01	07	19	03	N	O	Q07	T	10
0994.02	07	19	03	N	O	B82	X30	10
0995.01	07	19	04	N	O			10
0996.01	07	19	10	N	C	A16	C	10
0998.01	07	20	02	N	C	G92	X40	09
1000.01	07	20	05	N	U	Q07	X11	09
1001.01	07	20	08	N	U	B21	C06	09
1001.02	07	20	08	N	U	B82	C18	09
1001.03	07	20	08	N	U	B21	P06	09
1001.04	07	20	08	N	U	N15	T	09
1001.05	07	20	08	N	U	Q07	F	09
1002.01	07	20	09	N	U	A16	P09	09
1004.01	07	21	03	N	N	Q17	P07	09
1005.01	07	21	06	N	N	Q07	X26	09
1005.02	07	21	06	N	N	B21	X14	09
1005.03	07	21	06	N	N	G09	C13	09
1006.01	07	21	08	N	N	B82	P08	09
1007.01	07	21	09	N	N	B82	X01	09
1016.01	07	24	01	N	O	G03	C17	08
1018.01	07	24	04	N	U	G10	C	08
1021.01	07	25	02	N	U	Q07	C19	05
1023.01	07	25	04	N	U	B82	P14	05
1023.02	07	25	04	N	U	Q07	C13	05
1023.03	07	25	04	N	U	Q26	C	05
1024.01	07	25	05	N	U	W02	C22	05
1025.01	07	26	02	N	N	Q06	C21	02
1025.02	07	26	02	N	N	Q17	P10	02
1047.01	08	15	06	N	U	Q07	X09	10
1048.01	08	15	08	N	U	Q11	C14	10
1050.01	08	15	10	N	U	N15	T	10
1050.02	08	15	10	N	U	B21	X14	10

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
1074.01	08	20	03	N	N	Q06	P	10
1076.01	08	20	05	N	N	Q07	C06	10
1100.01	08	26	02	N	N	24	X18	09
1101.01	08	26	04	N	N	G09	C04	09
1101.02	08	26	04	N	N	G09	C	09
1101.03	08	26	04	N	N	B82	B15	09
1101.04	08	26	04	N	N	A20	C	09
1102.01	08	26	05	N	N	A16	B04	09
1102.02	08	26	05	N	N	Q07	C07	09
1102.03	08	26	05	N	N	G03	C41	09
1102.04	08	26	05	N	N	A16	P11	09
1103.01	08	26	08	N	N	Q11	B15	09
1104.01	08	26	09	N	N	G03	X14	09
1104.02	08	26	09	N	N	G09	P05	09
1127.01	08	31	01	N	C	Q07	B12	06
1127.02	08	31	01	N	C	Q07	P	06
1129.01	08	31	06	N	U	G03	X23	06
1137.01	08	33	01	N	C	Q11	C21	06
1138.01	08	33	02	N	U	W02	B15	06
1139.01	08	33	06	N	U	Q07	C	06
1141.01	08	34	02	N	C	W02	X04	07
1141.02	08	34	02	N	C	N15	C05	07
1141.03	08	34	02	N	C	G12	C20	07
1141.04	08	34	02	N	C	G12	C23	07
1142.01	08	34	04	N	C	Q07	C	07
1143.01	08	34	06	N	U	Q26	C05	07
1145.01	08	35	01	N	C	Q07	C19	06
1145.02	08	35	01	N	C	Q07	C22	06
1145.03	08	35	01	N	C	Q07	C08	06
1146.01	08	35	02	N	C	B82	X06	06
1147.01	08	35	03	N	C	N15	C26	06
1147.02	08	35	03	N	C	A25	C22	06
1148.01	08	35	04	N	U	W01	X17	06
1149.01	08	35	05	N	U	Q11	C	06
1149.02	08	35	05	N	U	W02	C21	06
1149.03	08	35	05	N	U	Q17	C18	06
1149.04	08	35	05	N	U	Q23	X17	06
1149.05	08	35	05	N	U	B82	P06	06
1149.06	08	35	05	N	U	B82	C04	06
1149.07	08	35	05	N	U	B82	T	06
1150.01	08	35	06	N	U	G03	X03	06
1151.01	09	10	01	N	C	Q07	C	03
1152.01	09	10	03	N	U	W02	C04	03
1156.01	09	12	03	N	C	Q07	C16	05
1156.02	09	12	03	N	C	Q26	X14	05
1156.03	09	12	03	N	C	Q07	C	05
1156.04	09	12	03	N	C	Q17	X17	05
1157.01	09	12	04	N	U	Q07	P05	05
1157.02	09	12	04	N	U	Q07	C06	05
1160.01	09	13	03	N	U	Q07	X14	06

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LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
1163.01	09	14	01	N	N	Q26	C	02
1163.02	09	14	01	N	N	G12	C23	02
1163.03	09	14	01	N	N	G10	B13	02
1163.04	09	14	01	N	N	A25	B14	02
1164.01	09	14	02	N	N	Q07	B08	02
1165.01	09	15	01	N	O	Q17	X03	09
1165.02	09	15	01	N	O	N15	X31	09
1167.01	09	15	04	N	U	G09	X18	09
1167.02	09	15	04	N	U	Q07	C	09
1168.01	09	15	09	N	U	B82	X31	09
1169.01	09	16	01	N	N	A16	B16	09
1169.02	09	16	01	N	N	Q07	X16	09
1170.01	09	16	05	N	N	B82	C	09
1171.01	09	16	09	N	N	W19	X21	09
1172.01	09	18	01	N	N	B21	B13	09
1172.02	09	18	01	N	N	B82	B17	09
1172.03	09	18	01	N	N	Q17	X10	09
1172.04	09	18	01	N	N	A16	C24	09
1172.05	09	18	01	N	N	B82	P07	09
1173.01	09	18	02	N	N	A16	C	09
1173.02	09	18	02	N	N	Q07	C22	09
1175.01	09	18	05	N	N	Q26	C	09
1176.01	09	18	08	N	N	Q07	F	09
1180.01	09	20	02	N	N	Q26	C02	04
1181.01	09	20	04	N	N	W01	C22	04
1181.02	09	20	04	N	N	G12	B11	04
1184.01	09	21	05	N	N	Q17	C	09
1184.02	09	21	05	N	N	A16	C	09
1184.03	09	21	05	N	N	Q07	C04	09
1184.04	09	21	05	N	N	N15	P13	09
1184.05	09	21	05	N	N	Q07	B08	09
1185.01	09	21	07	N	N	Q07	P15	09
1186.01	09	21	09	N	N	Q23	P01	09
1186.02	09	21	09	N	N	Q26	X02	09
1187.01	09	22	02	N	C	Q26	C01	09
1187.02	09	22	02	N	C	B82	P07	09
1187.03	09	22	02	N	C	A16	B11	09
1188.01	09	22	04	N	U	Q26	C51	09
1189.01	09	23	01	N	N	W01	C	07
1189.02	09	23	01	N	N	G92	T	07
1191.01	09	23	03	N	N	A16	X09	07
1192.01	09	23	04	N	N	H18	A01	07
1194.01	09	24	06	N	N	G10	X20	06
1194.02	09	24	06	N	N	A16	P07	06
1196.01	09	25	04	N	N	W02	C22	09
1197.01	09	25	08	N	N	B82	X30	09
1198.01	09	25	09	N	N	Q26	P02	09
1198.02	09	25	09	N	N	G12	X02	09
1245.01	10	11	01	N	N	Q17	C08	05
1245.02	10	11	01	N	N	Q07	X01	05

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
1246.01	10	11	02	N	N	G10	X25	05
1246.02	10	11	02	N	N	G10	C	05
1247.01	10	11	03	N	N	G12	C14	05
1248.01	10	11	04	N	N	Q11	X08	05
1249.01	10	11	05	N	N	Q07	X23	05
1250.01	10	12	01	N	N	G12	C23	05
1250.02	10	12	01	N	N	G12	B04	05
1251.01	10	12	02	N	N	C14		05
1252.01	10	12	04	N	N	G09	C	05
1252.02	10	12	04	N	N	W01	X08	05
1253.01	10	12	05	N	N	B82	C17	05
1253.02	10	12	05	N	N	G09	C	05
1254.01	10	13	01	N	N	Q07	B03	04
1255.01	10	13	02	N	N	Q26	X13	04
1255.02	10	13	02	N	N	G03	X21	04
1255.03	10	13	02	N	N	A16	P07	04
1255.04	10	13	02	N	N	W01	C20	04
1255.05	10	13	02	N	N	Q17	C01	04
1255.06	10	13	02	N	N	Q07	C06	04
1256.01	10	13	03	N	N	Q17	P14	04
1256.02	10	13	03	N	N	Q07	B15	04
1257.01	10	13	04	N	N	B82	P06	04
1258.01	10	14	05	N	N	Q07	F	05
1258.02	10	14	05	N	N	Q07	C25	05
1258.03	10	14	05	N	N	G09	X03	05
1261.01	10	15	03	N	U	Q26	C	04
1261.02	10	15	03	N	U	Q11	B02	04
1262.01	10	15	04	N	U	G92	C02	04
1262.02	10	15	04	N	U	B22	F	04
1264.01	10	16	04	N	N	Q07	C51	05
1265.01	10	16	05	N	N	Q07	X09	05
1268.01	10	17	03	N	U	Q17	X08	07
1269.01	10	17	04	N	U	Q26	B05	07
1270.01	10	17	05	N	U	H18	B10	07
1270.02	10	17	05	N	U	B22	C01	07
1270.03	10	17	05	N	U	W01	C05	07
1271.01	10	17	06	N	U	W02	X03	07
1272.01	10	17	07	N	U	Q17	C08	07
1274.01	10	18	02	N	O	A25	B15	08
1274.02	10	18	02	N	O	G12	B17	08
1275.01	10	18	04	N	O	S08	B17	08
1276.01	10	18	05	N	C	Q07	T	08
1276.02	10	18	05	N	C	A20	C23	08
1277.01	10	18	08	N	U	Q17	P10	08
1287.01	10	22	03	N	N	24	C	09
1287.02	10	22	03	N	N	G10	P	09
1287.03	10	22	03	N	N	B22	X06	09
1289.01	10	22	08	N	N	Q26	X13	09
1290.01	10	22	09	N	N	Q07	C01	09
1293.01	10	23	03	N	C	G92	P04	08

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
1293.02	10	23	03	N	C	B82	C22	08
1293.03	10	23	03	N	C	B82	B13	08
1294.01	10	23	04	N	U	Q07	B11	08
1295.01	10	23	05	N	U	A16	X06	08
1295.02	10	23	05	N	U	B82	C17	08
1296.01	10	23	07	N	U	Q17	X15	08
1296.02	10	23	07	N	U	Q07	C	08
1297.01	10	23	08	N	U	[illegible]	[illegible]	08
1300.01	10	26	01	N	N	W01	C01	09
1300.02	10	26	01	N	N	M13	B08	09
1301.01	10	26	05	N	N	A16	C18	09
1301.02	10	26	05	N	N	A16	C01	09
1302.01	10	26	07	N	N	A20	P03	09
1303.01	10	26	08	N	N	Q17	X13	09
1304.01	10	26	09	N	N	W02	P01	09
1307.01	10	28	02	N	O	Q17	C06	09
1307.02	10	28	02	N	O	W02	C	09
1309.01	10	28	04	N	U	Q17	C01	09
1310.01	10	28	07	N	U	B82	X09	09
1310.02	10	28	07	N	U	B22	C03	09
1311.01	10	28	08	N	U	B22	X01	09
1313.01	10	29	03	N	O	A16	C08	07
1313.02	10	29	03	N	O	A16	C08	07
1314.01	10	29	05	N	O	H18	A01	07
1314.02	10	29	05	N	O	Q07	P01	07
1314.03	10	29	05	N	O	Q26	P15	07
1314.04	10	29	05	N	O	A16	C05	07
1314.05	10	29	05	N	O	B82	C09	07
1314.06	10	29	05	N	O	Q17	B08	07
1315.01	10	29	07	N	C	G92	C01	07
1331.01	10	33	01	N	N	G10	B05	07
1331.02	10	33	01	N	N	A28	X06	07
1331.03	10	33	01	N	N	G12	C23	07
1332.01	10	33	03	N	N	N15	C41	07
1332.02	10	33	03	N	N	A20	C07	07
1332.03	10	33	03	N	N	Q07	B17	07
1333.01	10	33	05	N	N	Q17	P01	07
1333.02	10	33	05	N	N	W02	C04	07
1333.03	10	33	05	N	N	Q17	C07	07
1338.01	10	35	01	N	C	Q07	P17	09
1338.02	10	35	01	N	C	G12	X21	09
1338.03	10	35	01	N	C	A16	C19	09
1338.04	10	35	01	N	C	B82	C	09
1338.05	10	35	01	N	C	N15	C	09
1339.01	10	35	03	N	U	A20	C02	09
1339.02	10	35	03	N	U	Q07	C10	09
1339.03	10	35	03	N	U	B21	C41	09
1339.04	10	35	03	N	U	Q07	C15	09
1340.01	10	35	05	N	U	A28	C04	09
1340.02	10	35	05	N	U	B82	C41	09

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
1340.03	10	35	05	N	U	Q17	P10	09
1341.01	10	35	08	N	U	Q23	P02	09
1341.02	10	35	08	N	U	Q07	P02	09
1341.03	10	35	08	N	U	Q07	X13	09
1342.01	10	35	09	N	U	A28	B15	09
1343.01	10	36	07	N	N	Q11	B09	07
1344.01	11	16	01	N	C	G12	C	07
1345.01	11	16	02	N	C	Q07	P06	07
1345.02	11	16	02	N	C	Q26	X17	07
1346.01	11	16	03	N	U	Q07	C	07
1346.02	11	16	03	N	U	Q07	C13	07
1346.03	11	16	03	N	U	W02	T	07
1346.04	11	16	03	N	U	G92	C05	07
1346.05	11	16	03	N	U	B82	T	07
1347.01	11	16	05	N	U	Q07	X11	07
1348.01	11	16	07	N	U	A28	B07	07
1354.01	11	18	03	N	U	B82	B11	04
1355.01	11	18	04	N	U	G92	X40	04
1355.02	11	18	04	N	U	W01	X03	04
1355.03	11	18	04	N	U	G09	C	04
1355.04	11	18	04	N	U	Q17	P15	04
1355.05	11	18	04	N	U	A16	C01	04
1356.01	11	19	01	N	O	G03	C04	06
1358.01	11	19	04	N	U	Q11	B08	06
1359.01	11	19	05	N	U	Q26	C19	06
1360.01	11	19	06	N	U	Q07	P02	06
1360.02	11	19	06	N	U	B82	P08	06
1360.03	11	19	06	N	U	Q07	X26	06
1360.04	11	19	06	N	U	W02	X	06
1361.01	11	20	01	N	N	W01	C21	06
1361.02	11	20	01	N	N	A28	C03	06
1362.01	11	20	02	N	N	Q07	T	06
1363.01	11	20	03	N	N	G03	P04	06
1364.01	11	20	04	N	N	W02	P15	06
1365.01	11	20	06	N	N	Q07	P14	06
1388.01	11	26	01	N	N	G09	C	06
1389.01	11	26	04	N	N	N15	X18	06
1389.02	11	26	04	N	N	W02	C04	06
1390.01	11	26	05	N	N	W02	P05	06
1391.01	11	26	06	N	N	Q17	X11	06
1391.02	11	26	06	N	N	G92	C22	06
1417.01	11	34	02	N	N	W19	X24	06
1417.02	11	34	02	N	N	Q07	C	06
1418.01	11	34	04	N	N	Q26	X	06
1418.02	11	34	04	N	N	A16	C09	06
1418.03	11	34	04	N	N	W02	X04	06
1418.04	11	34	04	N	N	Q07	C08	06
1419.01	11	34	05	N	N	G12	C41	06
1419.02	11	34	05	N	N	Q07	B08	06
1420.01	11	34	06	N	N	B82	C	06

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
1420.02	11	34	06	N	N	Q07	C	06
1424.01	11	36	02	N	O	G12	S	05
1424.02	11	36	02	N	O	Q07	B09	05
1424.03	11	36	02	N	O	Q07	B09	05
1424.04	11	36	02	N	O	N15	T	05
1426.01	11	36	05	N	U	Q17	C14	05
1426.02	11	36	05	N	U	S08	X	05
1427.01	11	37	03	N	N			04
1427.02	11	37	03	N	N	W01	C22	04
1427.03	11	37	03	N	N	G10	C	04
1427.04	11	37	03	N	N	Q07	C22	04
1428.01	11	37	04	N	N	W02	C06	04
1428.02	11	37	04	N	N	W01	T	04
1429.01	11	38	01	N	O	W02	C	04
1431.01	11	38	04	N	U	B21	X16	04
1431.02	11	38	04	N	U	G92	C22	04
1431.03	11	38	04	N	U	Q07	T	04
1432.01	11	39	01	N	C	C14		03
1432.02	11	39	01	N	C	Q26	X03	03
1432.03	11	39	01	N	C	Q07	P01	03
1432.04	11	39	01	N	C	G10	C22	03
1432.05	11	39	01	N	C	B22	C	03
1432.06	11	39	01	N	C	Q26	C13	03
1432.07	11	39	01	N	C	Q07	C	03
1433.01	11	39	02	N	U	Q07	C22	03
1434.01	11	39	03	N	U	Q07	P06	03
1434.02	11	39	03	N	U	G92	C03	03
1435.01	12	18	01	N	O	Q07	B11	04
1435.02	12	18	01	N	O	N15	C05	04
1435.03	12	18	01	N	O	A25	C17	04
1435.04	12	18	01	N	O	Q07	C19	04
1436.01	12	18	02	N	O	Q07	C19	04
1436.02	12	18	02	N	O	A20	B11	04
1437.01	12	18	03	N	C	Q07	C41	04
1437.02	12	18	03	N	C	B21	P11	04
1437.03	12	18	03	N	C	G92	P03	04
1437.04	12	18	03	N	C	B82	P08	04
1438.01	12	18	04	N	U	G09	C04	04
1439.01	12	19	01	N	N	Q07	C09	04
1439.02	12	19	01	N	N	Q07	C18	04
1440.01	12	19	02	N	N	G12	C	04
1440.02	12	19	02	N	N	G92	C24	04
1441.01	12	20	03	N	N	Q07	C07	04
1442.01	12	20	04	N	N	B82	X32	04
1443.01	12	21	01	N	C	R29	A02	05
1443.02	12	21	01	N	C	Q07	B06	05
1443.03	12	21	01	N	C	G12	C	05
1443.04	12	21	01	N	C	Q07	A01	05
1444.01	12	21	03	N	U	Q17	X	05
1444.02	12	21	03	N	U	A25	B17	05

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
1444.03	12	21	03	N	U	G92	T	05
1444.04	12	21	03	N	U	Q07	B06	05
1444.05	12	21	03	N	U	Q07	C06	05
1445.01	12	21	04	N	U	G09	X04	05
1445.02	12	21	04	N	U	G03	P04	05
1446.01	12	21	05	N	U	Q07	P	05
1446.02	12	21	05	N	U	Q07	C12	05
1454.01	12	24	03	N	N	Q07	X17	06
1455.01	12	24	04	N	N	Q07	X32	06
1455.02	12	24	04	N	N	B82	C10	06
1455.03	12	24	04	N	N	B82	T	06
1456.01	12	24	06	N	N	G12	C	06
1456.02	12	24	06	N	N	Q07	F	06
1456.03	12	24	06	N	N	G10	B17	06
1461.01	12	26	01	N	N	Q07	C22	06
1461.02	12	26	01	N	N	A16	T	06
1462.01	12	26	02	N	N	W02	C12	06
1465.01	12	26	06	N	N	Q07	B06	06
1466.01	12	27	01	N	N	Q17	C08	08
1467.01	12	27	03	N	N	Q11	C08	08
1468.01	12	27	05	N	N	Q26	C01	08
1468.02	12	27	05	N	N	Q26	C14	08
1469.01	12	27	08	N	N	Q06	X07	08
1470.01	12	28	01	N	C	Q07	X25	08
1470.02	12	28	01	N	C	W01	C41	08
1471.01	12	28	02	N	U	Q17	C	08
1471.02	12	28	02	N	U	W01	C23	08
1471.03	12	28	02	N	U	G12	C	08
1472.01	12	28	03	N	U	Q26	A01	08
1475.01	12	28	07	N	U	Q07	B17	08
1482.01	12	30	02	N	N	G12	C23	08
1482.02	12	30	02	N	N	Q06	P01	08
1484.01	12	30	08	N	N	A16	X19	08
1484.02	12	30	08	N	N	G10	X03	08
1484.03	12	30	08	N	N	G92	P05	08
1486.01	12	31	05	N	U	Q26	C05	05
1486.02	12	31	05	N	U	Q17	C22	05
1487.01	12	32	03	N	N	N15	C05	05
1487.02	12	32	03	N	N	N15	C	05
1487.03	12	32	03	N	N	B22	C14	05
1488.01	12	32	05	N	N	A28	F	05
1488.02	12	32	05	N	N	Q07	C	05
1488.03	12	32	05	N	N	G12	P	05
1488.04	12	32	05	N	N	Q07	T	05
1488.05	12	32	05	N	N	G09	C01	05
1488.06	12	32	05	N	N	A16	X31	05
1488.07	12	32	05	N	N	G12	C51	05
1488.08	12	32	05	N	N	B82	C01	05
1488.09	12	32	05	N	N	G12	X07	05
1488.10	12	32	05	N	N	B82	C01	05

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
1488.11	12	32	05	N	N	N15	B14	05
1489.01	12	33	01	N	N	A30	B14	05
1489.02	12	33	01	N	N	G12	C23	05
1490.01	12	33	02	N	N	R29	A05	05
1490.02	12	33	02	N	N	R29	A05	05
1490.03	12	33	02	N	N	Q26	A01	05
1490.04	12	33	02	N	N	Q26	C25	05
1490.05	12	33	02	N	N	A30	C	05
1490.06	12	33	02	N	N	Q07	C	05
1490.07	12	33	02	N	N	S08	T	05
1490.08	12	33	02	N	N	G92	X	05
1491.01	12	33	03	N	N	G03	C24	05
1491.02	12	33	03	N	N	Q07	B16	05
1493.01	12	33	05	N	N	Q17	B04	05
1494.01	12	34	01	N	N	Q07	X09	04
1495.01	12	34	03	N	N	Q07	C08	04
1495.02	12	34	03	N	N	B82	C	04
1496.01	12	34	04	N	N	A28	P06	04
1497.01	12	35	01	N	O	Q17	C02	05
1497.02	12	35	01	N	O	Q07	C	05
1497.03	12	35	01	N	O	G03	C22	05
1497.04	12	35	01	N	O	Q07	X17	05
1498.01	12	35	02	N	C	G10	X18	05
1499.01	12	35	03	N	U	C14		05
1500.01	12	35	05	N	U	G09	X	05
1501.01	13	20	03	N	N	G92	C02	04
1501.02	13	20	03	N	N	A25	P08	04
1502.01	13	20	04	N	N	Q07	X13	04
1503.01	13	21	01	N	N	C14		03
1504.01	13	21	02	N	N	24	C09	03
1504.02	13	21	02	N	N	A16	C	03
1504.03	13	21	02	N	N	Q17	C03	03
1504.04	13	21	02	N	N	Q26	C	03
1505.01	13	21	03	N	N	B82	X04	03
1505.02	13	21	03	N	N	A16	C08	03
1505.03	13	21	03	N	N	Q07	T	03
1505.04	13	21	03	N	N	W01	X	03
1510.01	13	24	01	N	O	Q07	C	05
1510.02	13	24	01	N	O	Q07	C	05
1510.03	13	24	01	N	O	Q26	T	05
1512.01	13	24	03	N	U	Q07	P	05
1513.01	13	24	04	N	U	Q26	B07	05
1513.02	13	24	04	N	U	W19	C03	05
1513.03	13	24	04	N	U	Q06	X32	05
1513.04	13	24	04	N	U	G09	T	05
1513.05	13	24	04	N	U	B82	B13	05
1513.06	13	24	04	N	U	Q26	X06	05
1513.07	13	24	04	N	U	G10	X03	05
1513.08	13	24	04	N	U	G10	X03	05
1514.01	13	24	05	N	U	Q23	C	05

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
1515.01	13	25	01	N	C	Q07	C13	01
1515.02	13	25	01	N	C	Q07	C	01
1515.03	13	25	01	N	C	Q07		01
1515.04	13	25	01	N	C	Q07	C	01
1515.05	13	25	01	N	C	Q07	C	01
1515.06	13	25	01	N	C	Q07	C	01
1517.01	13	26	02	N	C	R29	A04	05
1518.01	13	26	03	N	U	W02	B15	05
1518.02	13	26	03	N	U	Q17	C25	05
1518.03	13	26	03	N	U	Q07	C25	05
1518.04	13	26	03	N	U	G92	T	05
1518.05	13	26	03	N	U			05
1519.01	13	26	04	N	U	Q07	C08	05
1519.02	13	26	04	N	U	Q26	C08	05
1519.03	13	26	04	N	U	Q17	C03	05
1519.04	13	26	04	N	U	B22	X06	05
1519.05	13	26	04	N	U	A16	X40	05
1520.01	13	26	05	N	U	Q07	P01	05
1520.02	13	26	05	N	U	Q07	C10	05
1520.03	13	26	05	N	U	W02	T	05
1520.04	13	26	05	N	U	Q07	B04	05
1521.01	13	27	01	N	N	W01	C26	05
1522.01	13	27	02	N	N			05
1523.01	13	27	03	N	N	B21	X17	05
1523.02	13	27	03	N	N	G12	C04	05
1523.03	13	27	03	N	N	Q17	P14	05
1523.04	13	27	03	N	N	B82	X06	05
1524.01	13	27	04	N	N	W01	B16	05
1524.02	13	27	04	N	N	Q17	C	05
1525.01	13	27	05	N	N	Q07	B05	05
1525.02	13	27	05	N	N	B82	X31	05
1526.01	13	28	01	N	C	W02	T	05
1526.02	13	28	01	N	C	Q07	C41	05
1527.01	13	28	02	N	C	Q07	C19	05
1527.02	13	28	02	N	C	G92	X03	05
1528.01	13	28	03	N	U	W02	T	05
1528.02	13	28	03	N	U	A16	T	05
1528.03	13	28	03	N	U	B21	X06	05
1528.04	13	28	03	N	U	A16	C01	05
1529.01	13	28	05	N	U	Q07	C41	05
1529.02	13	28	05	N	U	G12	X02	05
1529.03	13	28	05	N	U	Q23	C06	05
1529.04	13	28	05	N	U	A16	P04	05
1529.05	13	28	05	N	U	B22	T	05
1529.06	13	28	05	N	U	G12	C07	05
1529.07	13	28	05	N	U			05
1535.01	13	30	06	N	C	Q07	X31	06
1544.01	13	33	04	N	U	A30	B06	04
1544.02	13	33	04	N	U	A28	B05	04
1544.03	13	33	04	N	U	Q07	B08	04

APPENDIX A
LISTING OF ARTIFACT DATABASE FOR MACKEY SITE

CATALOG NUMBER	ROW	ALLEY	LEVEL	BURIAL FLAG	CERAMICS FLAG	MATERIAL	TOOL TYPE	MAX LEVEL
1544.04	13	33	04	N	U	W02	X21	04
1544.05	13	33	04	N	U	G92	C	04
1544.06	13	33	04	N	U	N15	B	04
1547.01	13	34	04	N	U	Q17	C11	05
1547.02	13	34	04	N	U	G12	X	05
1547.03	13	34	04	N	U	24	B16	05
1548.01	13	34	05	N	U	Q07	C51	05
1548.02	13	34	05	N	U	G92	C	05
1549.01	13	35	01	N	C	Q26	C51	05
1549.02	13	35	01	N	C	Q26	C17	05
1549.03	13	35	01	N	C	G10	X14	05
1549.04	13	35	01	N	C	Q26	T	05
1549.05	13	35	01	N	C	B82	X30	05
1549.06	13	35	01	N	C	W01	C	05
1549.07	13	35	01	N	C	Q23	C16	05
1550.01	13	35	05	N	U	A30	C02	05
1550.02	13	35	05	N	U	Q26	C	05
1550.03	13	35	05	N	U	G12	C05	05
1551.01	14	30	02	N	N	Q07	B08	03
1552.01	14	30	03	N	N	Q07	C03	03
1552.02	14	30	03	N	N	A20	C23	03
1552.03	14	30	03	N	N	Q07	C10	03
1552.04	14	30	03	N	N	Q17	X11	03
1553.01	14	31	02	N	N	Q07	B11	02
1553.02	14	31	02	N	N	Q26	C	02
1554.01	14	32	03	N	N	H18	A01	03
1555.01	15	30	01	N	N	Q07	P16	03
1555.02	15	30	01	N	N	Q07	T	03
1555.03	15	30	01	N	N	Q17	X11	03
1555.04	15	30	01	N	N	G03	C26	03
1555.05	15	30	01	N	N	B22	C24	03
1555.06	15	30	01	N	N	W02	C11	03
1555.07	15	30	01	N	N	Q07	X26	03
1556.01	15	30	02	N	N	Q23	C23	03
1556.02	15	30	02	N	N	Q07	P17	03
1556.03	15	30	02	N	N	Q07	C14	03
1557.01	15	30	03	N	N	H18	A03	03
1558.01	15	31	01	N	C	Q07	C	
1558.02	15	31	01	N	C	G12	C	
1558.03	15	31	01	N	C	Q26	C	
1856.01	11	36	04	N	U	G09	C23	05
1856.02	11	36	04	N	U	A28	C	05
1856.03	11	36	04	N	U	G10	C22	05