Archaeological Investigations for the Relocation of Valmeyer, Monroe County, Illinois

Volume 3: The Stemler Bluff Site

by Gregory R. Walz, Brian Adams, Jacqueline M. McDowell, Paul P. Kreisa, Kevin P. McGowan, Kristin Hedman, and Cynthia L. Balek

Public Service Archaeology Program

Research Report No.28

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VOLUME 3: THE STEMLER BLUFF SITE

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ABSTRACT

Phase II investigations by the Public Service Archaeology Program of the University of Illinois at Urbana-Champaign for the Federal Emergency Management Agency indicated that 11MO891, the Stemler Bluff site, was eligible for listing in the National Register of Historic Places. Total data recovery was conducted by the Public Service Archaeology Program in advance of construction for the relocation of the community of Valmeyer, Illinois, from 27 July through 16 September 1994. The project was funded by the Federal Emergency Management Agency through a subcontract with Woodward-Clyde Federal Services of Gaithersburg, Maryland. The plow zone was mechanically removed from over 25,000 m^2 and 218 prehistoric pit and structural features were exposed. Thirteen radiocarbon age determinations on charred wood and nutshell indicate occupation of the site between 1110 and 760 B.P. The assemblage from the site includes ceramic, lithic, and subsistence remains, indicative of recurrent, but never intensive, occupation during the Late Woodland, Emergent Mississippian, and Mississippian periods. Also present is a spatially discrete mortuary area containing 51 features.

CHAPTER 1.
INTRODUCTION

The Stemler Bluff site (11MO891) is located north of an unnamed hollow at the Mississippi River bluff crest approximately 2.4 km northeast of Valmeyer, Illinois (Figure 1-1). The site is situated on a relatively broad upland ridge between drainage divides that drain northwest into the Mississippi River floodplain. West of the site, the landscape narrows into a long ridge that extends west to north and overlooks the Mississippi River floodplain. To the east the landscape is broad and rolling with numerous sinkholes. One large sinkhole is located on the southwestern edge of the site near the unnamed hollow. Agriculture has removed the native vegetation from the site, but the steep slopes of the hollow are brush and tree covered. It is likely the entire site was covered with oak and hickory forest prior to 1830.

Previous Investigations

The site originally was located in 1993 by personnel from Southern Illinois University at Edwardsville (SIUE) as part of the previously defined 11MO841 (Figure 1-2) (Wells and Burns 1993). Wells and Burns (1993) suggested that portions of the expanded 11MO841 site area were potentially eligible for the National Register of Historic Places (NRHP). The Public Service Archaeology Program of the University of Illinois at Urbana-Champaign collected additional data during the Phase II evaluation of 11MO841, further refining site dimensions. The Phase II investigations resulted in the division of 11MO841 into 12 distinct sites, with the original area defined by McNerney (1989) retaining the 11MO841 site designation (McGowan 1994; Volume 1, this report). The Stemler Bluff site was the largest of the 11 newly defined sites within the SIUE 11MO841 site boundary. As characterized during the Phase II investigations (Volume 1), 11MO891 is roughly triangular in shape with the narrow portion located at the extreme western limits of the site. The site extends approximately 300 m east-west and 180 m north-south for a total site area of 4.2 ha (Figure 1-1). To the southeast is an historic farmstead with associated fence lines and a field road that extends into the prehistoric site area.

During the Phase II investigations, it was determined that surface materials were found north from the historic farmhouse and yard across a rolling upland ridge surrounding a large sinkhole on the site's southwestern margin. The portion of the site located within the farmstead yard was grass- and tree-covered while the rest of the site area was in a cleared agricultural field (Figure 1-3). Phase II investigations included a controlled surface collection, screened posthole tests in the farmhouse yard, deep backhoe trenching, machine stripping of the plow zone, and feature documentation and excavation. A total of 797 m^2 of surface area, approximately 1.5 percent of the total site, was excavated during the Phase II evaluation. Eight prehistoric features were documented including portions of two houses, three pits, a possible midden, a dark stain, and a possible burial. Materials recovered during the Phase II investigation indicated 11MO891 was occupied from the Middle Archaic period through the Mississippian period. The presence of intact cultural deposits at this multicomponent upland site demonstrated significant research potential. The site was recommended as eligible for listing in the NRHP, and Phase III mitigation of the site area was recommended (McGowan 1994 and Volume 1, this report).

Excavation Strategy

The location of this site within the area proposed for the relocation of Valmeyer resulted in the implementation of a mitigation plan to salvage archaeological data. Excavations at the Stemler Bluff site took place between 27 July and 16 September 1994. The excavation strategy implemented, large-scale machine excavations, is one that has seen success at

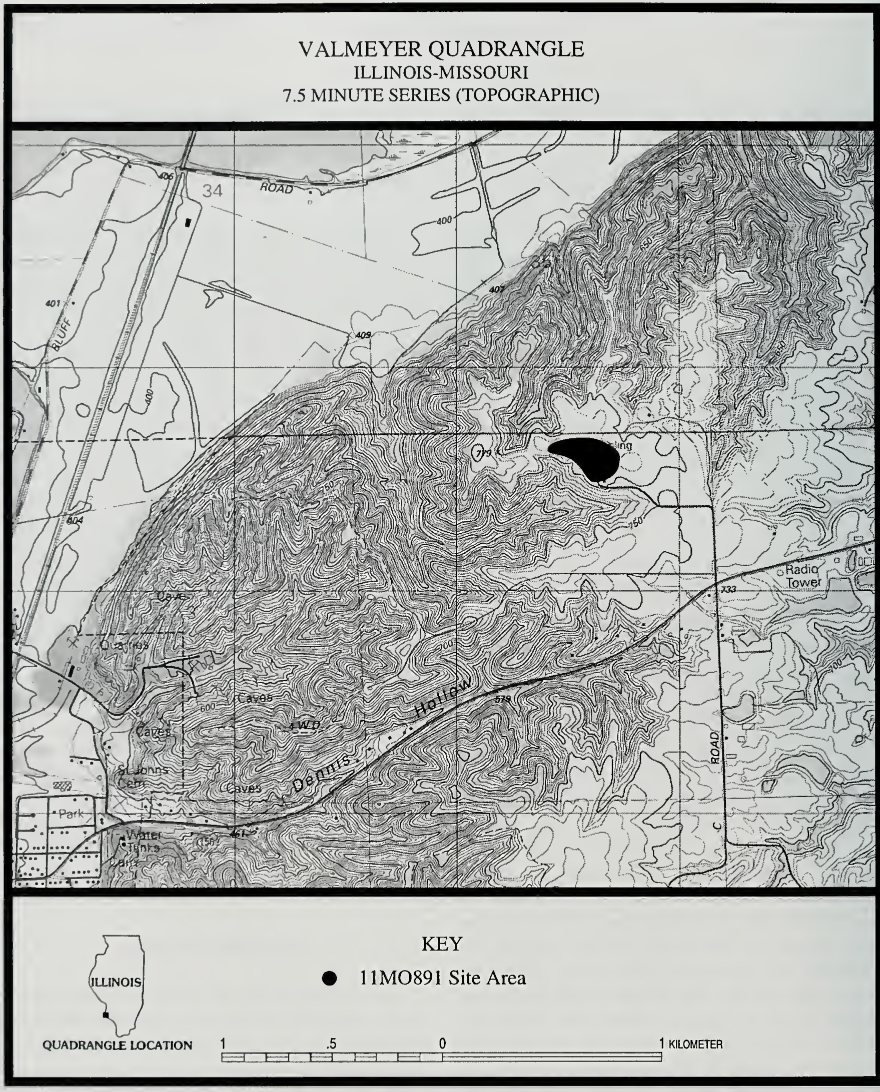

Figure 1-1. The Location of the Stemler Bluff Site, 11MO891.

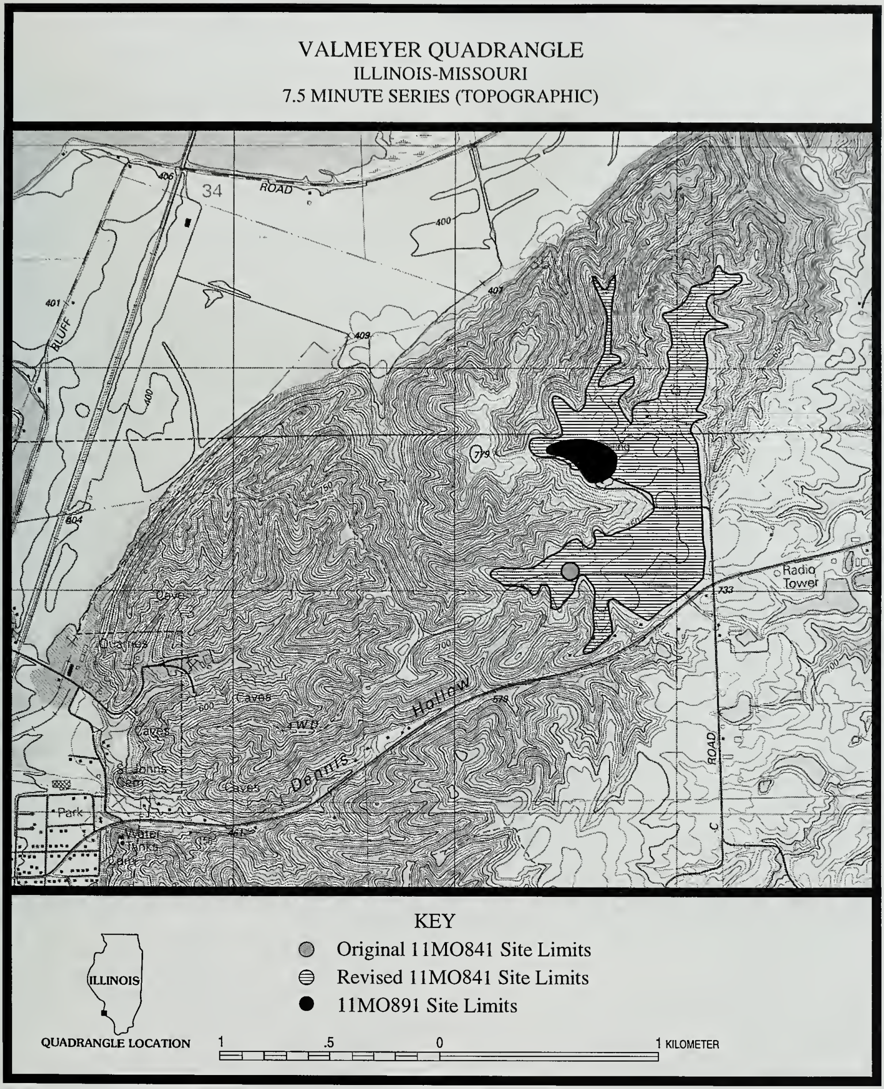

Figure 1-2. Original 11MO841 Site Limits (Wells and Burns 1993) and Defined Limits for 11MO891.

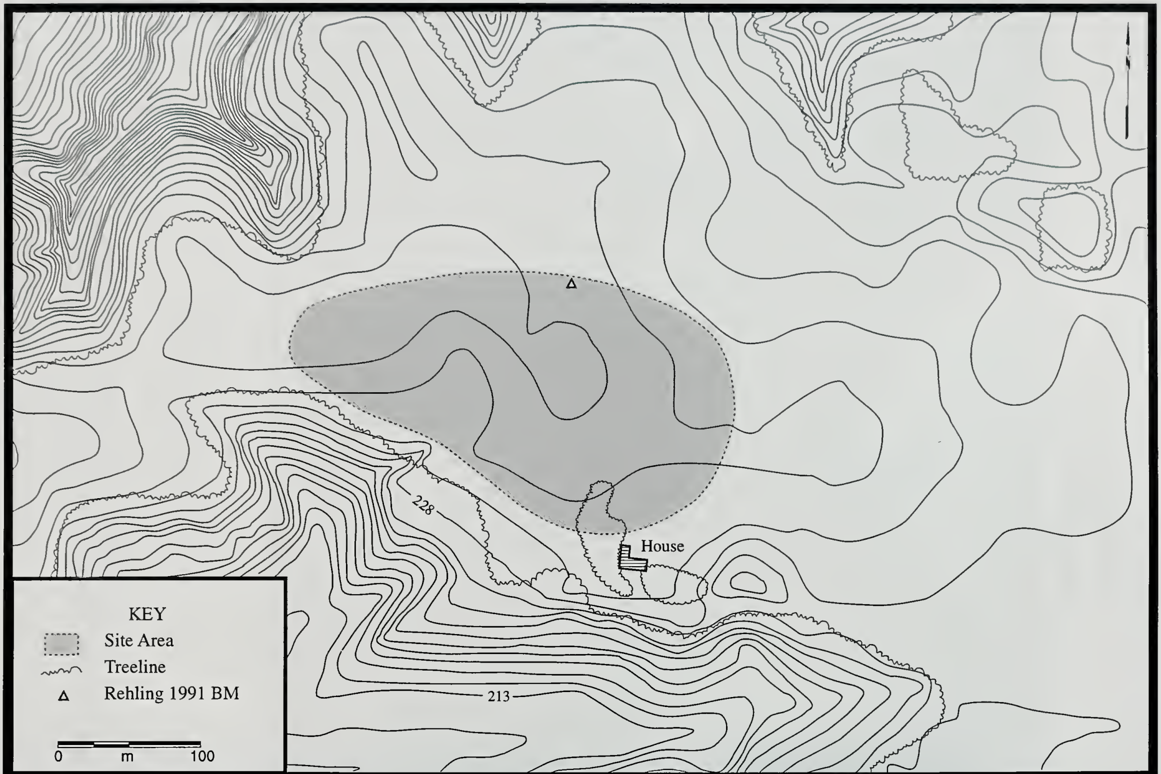

Figure 1-3. Topographic Map of 11MO891.

numerous prehistoric sites in the nearby American Bottom. Large-scale stripping of plow-zone deposits and subsequent feature identification have been shown to provide spatial data not commonly obtained through other methods (Bareis and Porter 1984; Binford et al. 1970). As well, this method provides a cost effective and timely method for mitigation of large sites faced with destruction (e.g., Bareis and Porter 1984; Binford et al. 1970).

The plow zone was mechanically removed from over 25,000 m^2 of the site as was up to 20 cm of the underlying subsoil. The removal of the disturbed plow-zone deposits allowed identification of dark subsurface stains and artifact concentrations. All stains from below the plow zone were evaluated to determine whether they were cultural features. Each stain or artifact concentration was assigned a unique number and further investigated. Excavations used a combination of troweling and shovel skimming. The features were photographed, and a plan view sketch map of each was drawn. Upon completion of this initial documentation, each nonmortuary feature was bisected, or quartered in the case of houses, along a major axis, and all fill was screened. A feature profile was drawn and photographed after the first half was excavated. The second half then was excavated, with all fill either screened or trowel sorted, and a flotation soil sample collected. When possible, charcoal samples also were collected for possible radiometric dating.

Excavation strategies differed for two areas of the Stemler Bluff site. Investigations in the sinkhole, located in the southwest portion of the site, used a backhoe to remove colluvial/alluvial overburden from several blocks. The soil stratigraphy in the trench cut was analyzed and described by a geomorphologist. Within the block excavations, three 1-x-2-m test units were excavated in arbitrary 10-cm levels. Each level was screened through 6.4-mm mesh hardware cloth. Five-liter flotation samples were collected from each level. The units were profiled and photographed. Mortuary features, located in the western part of the site, were excavated in plan with trowels and wooden picks in order to expose and minimize the destruction of any skeletal remains present. The excavation of burials at 11MO891 was conducted in accordance with the Illinois Human Skeletal Remains Protection Act (20 ILCS 3440; 17 IAC 4170). All burial excavations were conducted under the direction of a qualified skeletal analyst. Due to the fragile condition of the remains, elements were identified and described in situ prior to removal individually or embedded in surrounding soil matrix. Flotation samples were taken from soil surrounding cranial fragments, the pelvic cavity, and from beneath the burial. Additional methodological procedures are detailed in Chapter 4 of Volume 1 and Chapter 8 of this volume.

The investigations documented and analyzed a total of 218 prehistoric features. Nine types were defined, including shallow, medium, and deep basin-shaped pits, bell-shaped pits, isolated post molds, single-post-and-basin structures, wall-trench structures, mortuary, and indeterminate features. Radiometric dates from carbonized nutshell and wood collected from 13 features provide conventional ^{14}C dates ranging from 1110–760 B.P. The dates fall within the range assigned to the Late Woodland, Emergent Mississippian, and Mississippian periods. The assemblage contains extensive ceramic and lithic remains. The features, materials, and ^{14}C dates characterize the site as having recurrent occupation during a time span when cultural traditions in the American Bottom were changing rapidly. Occupation of the Stemler Bluff site appears to be continuous, although occupations were never extensive during any given cultural phase.

Overview

This volume details the archaeological investigations undertaken by the University of Illinois at Urbana-Champaign at the Stemler Bluff site. The reader is referred to Volume 1 of this report for an expanded discussion of the background to this project. A review of Late Woodland through Mississippian period culture history and investigations in the American Bottom and surrounding regions is provided in Chapter 2. Chapter 3 presents the general research orientation that guided the analysis of data recovered from the Stemler Bluff site. Excavation results are presented in Chapter 4 with an emphasis on site plan and features. Detailed material analyses are provided in Chapters 5 (ceramics), 6 (lithics), 7 (paleoethnobotanical), 8 (human remains), and 9 (faunal). Chapter 10 discusses the results of the investigation including the placement of the Stemler Bluff site within the American Bottom chronology. Detailed feature descriptions and material inventories for the Stemler Bluff site are provided as appendices to this volume.

CHAPTER 2.
THE LATE PREHISTORIC IN SOUTHWEST ILLINOIS

The late prehistoric era in southwest Illinois refers to the period of time that extends from approximately 1650 B.P. to 550 B.P. and encompasses three distinct temporal periods (Late Woodland, Emergent Mississippian, Mississippian). Known intact sites from these periods in southwest Illinois are numerous, and excavation data are extensive. As a result, a multitude of late prehistoric phases are recognized, each defined by a short time span and restricted geographic location (Figure 2-1). The late prehistoric is associated with modern climatic conditions and vegetation patterns documented by historic era settlers (Asch et al. 1972; Zawacki and Hausfater 1969). It represents an important period of population increase, technological change, and the emergence of new social orders (Kelly 1990a). It is during this time span that subsistence strategies based on a reliance on agricultural production of domesticated plants supplemented by hunting with a bow and arrow developed to their fullest extent in the Mississippi River valley. As documented at Cahokia and other mound centers in the American Bottom, portions of the population were organized into large, complex communities with social ties that extended beyond individual villages. At the same time, small farmsteads and hamlets dotted the floodplain and adjacent uplands (Fowler 1974; 1975; 1978; Gregg 1975; Griffin 1984; Milner 1990; Porter 1974). Overall, late prehistoric sites are highly variable in size and complexity, reflecting their differing roles within a larger settlement system and may be characterized by distinct artifact assemblages, feature distributions, and physiographic location.

To understand the significance of the Stemler Bluff site more fully and to place its interpretation into the proper archaeological context requires an understanding of regional late prehistoric research and culture history. The most germane investigations have been conducted in the American Bottom and adjacent uplands (Figure 2-2) (Bareis and Porter 1984; Emerson and Jackson 1984; Kelly 1987; Kelly 1990a, 1990b; Milner 1987a). The main limitation in this existing data base for placing the Stemler Bluff site into context is the preponderance of evidence from floodplain sites that was generated from sites located well north of Stemler Bluff. Given current interpretations of the late prehistoric sociocultural context, which recognize significant cultural variation over small geographic areas (e.g., Kelly 1990a, 1990b), the scant record for the extreme southern American Bottom and adjacent uplands creates interpretive limitations. Despite the paucity of data for the immediate southern American Bottom, however, a late prehistoric context to evaluate the Stemler Bluff site can be constructed from the available site survey and excavation data pertaining to the American Bottom region.

Interpretations of the late prehistoric era for the American Bottom region rely extensively on summaries of investigations for the region (e.g., Bareis and Porter 1984; Emerson 1992; Emerson and Jackson 1987; Kelly 1987, 1990a, 1990b; Lopinot 1992; Milner 1987a, 1991). Each of these summaries draws extensively from the published data resulting from the FAI-270 investigations, earlier salvage investigations, and unpublished research. The trends identified in these summaries provide distinct insights into late prehistoric adaptations in the region. For clarity, major trends recognized for each period are identified below along with a brief discussion of the variation recognized between specific phases.

The Late Woodland Period

The Late Woodland period in the American Bottom extends from 1650 B.P. to 1200 B.P. The period is characterized by an increased reliance on domesticated plants, a decreased importance of regional exchange, and an increased reliance on localized exchange networks when compared with the preceding Middle Woodland period (Braun

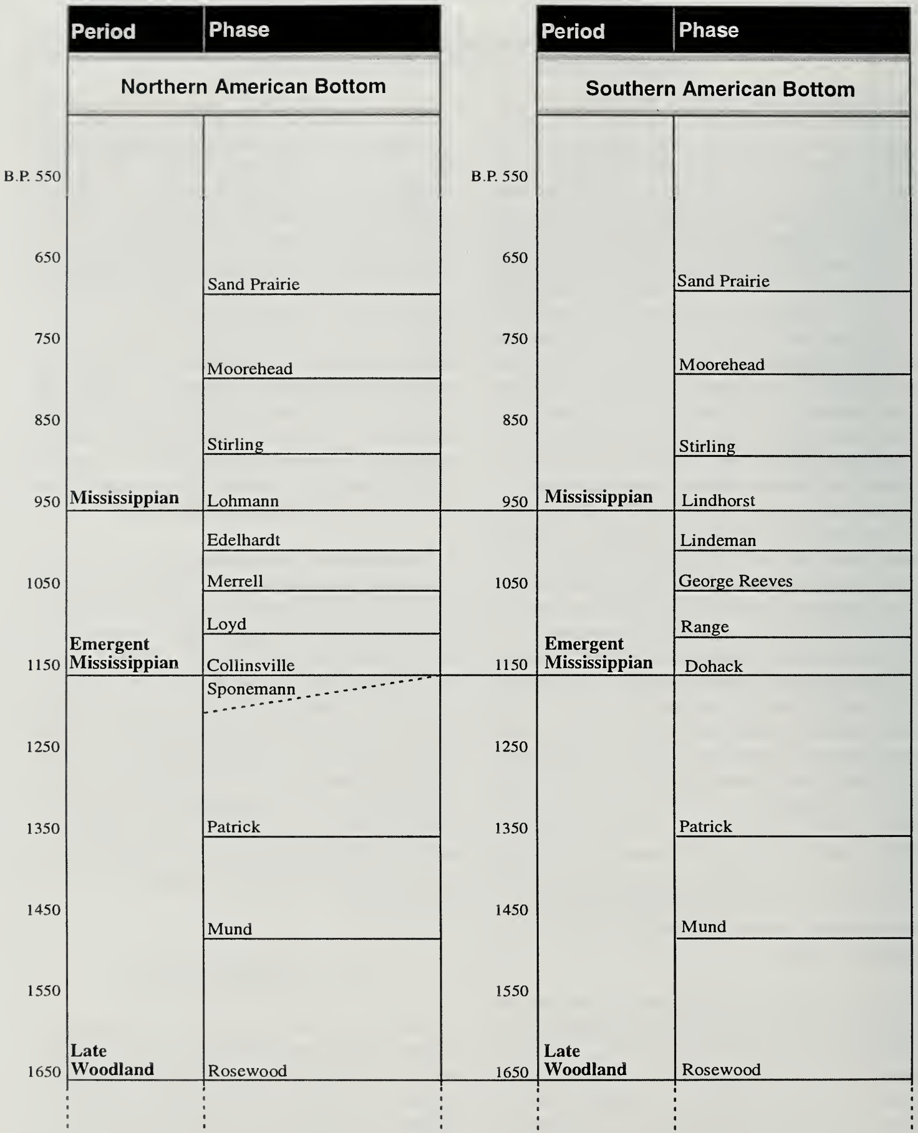

Figure 2-1. Late Prehistoric Chronology in Southwest Illinois (after Bareis and Porter 1984; Fortier 1996; Kelly 1990b).

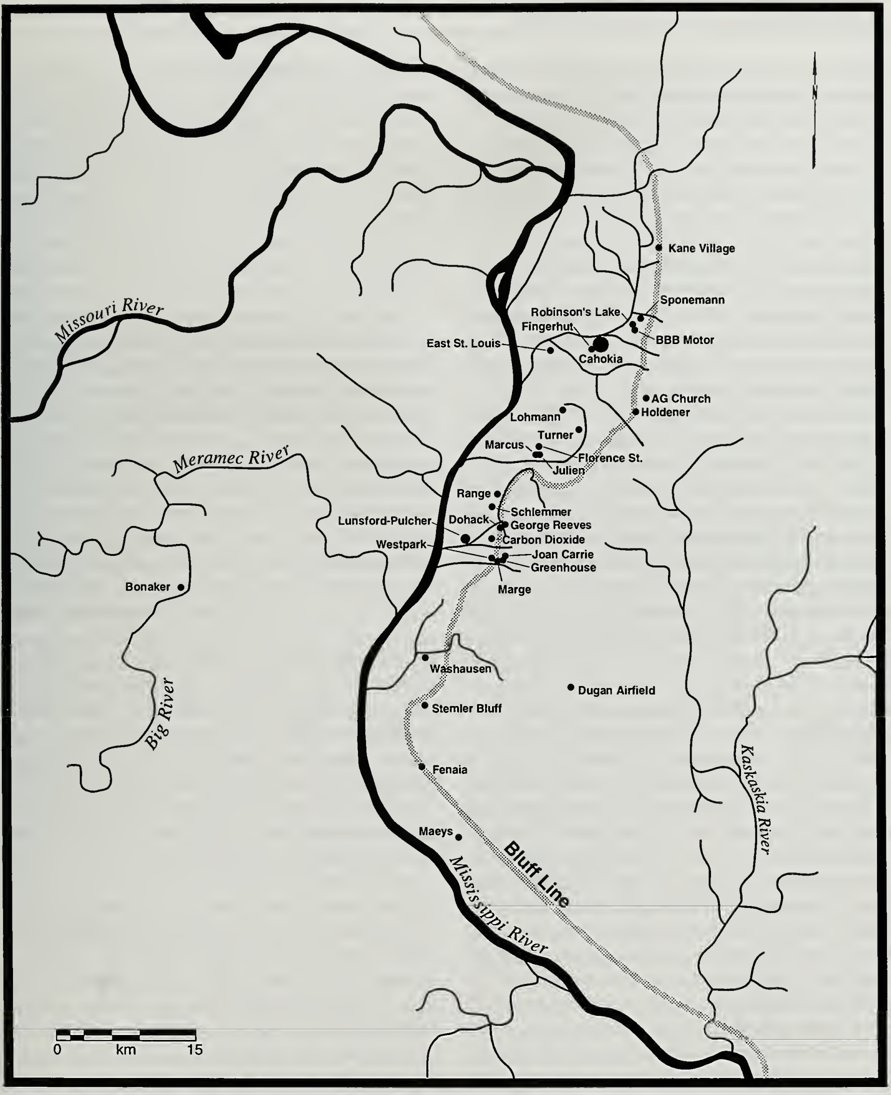

Figure 2-2. Locations of Late Prehistoric Sites Mentioned in Text.

1977). The Late Woodland also witnessed the introduction of the bow and arrow into the region (Kelly, Finney, McElrath, and Ozuk 1984).

Four sequential phases have been defined for the Late Woodland period in the American Bottom (Kelly, Finney, McElrath, and Ozuk 1984). The initial Late Woodland phase is Rosewood. This phase, 1650–1500 B.P., is distinguished by ceramics that lack most of the decorative treatments present during the Middle Woodland, with the exception of lip stamping, noding, and punctation. Rosewood phase ceramic vessels are limited to cordmarked jars with subconoidal bases. Rosewood phase components have been identified at Carbon Dioxide and Leingang in Monroe County (Bareis and Porter 1984). The following Late Woodland phase is Mund, 1500–1350 B.P., which is recognized by ceramic assemblages characterized by a relatively low frequency of decorated vessels and by diagnostic projectile points such as Lowe Flared Base or Steuben types. Mund phase components have been excavated at Mund, Columbia Quarry, and George Reeves in the American Bottom (Fortier et al. 1983; Kelly, Finney, McElrath and Ozuk; McElrath and Finney 1987; Bentz et al. 1988). The subsequent Late Woodland phase, Patrick, dates between 1350 and 1200 B.P. The Patrick phase also is recognized principally by its ceramics. Patrick phase ceramic assemblages consist mainly of vessels that are cordmarked to the rim with interior lip impressions (Bareis and Porter 1984). Patrick phase sites have been identified at Cahokia, Range, Columbia Quarry, Schlemmer, Dohack, Fish Lake, Columbia Farms, Westpark, Hamil, Range, Fenaia, and VFW (Kelly 1990a). The Patrick phase is the terminal Late Woodland phase in the southern portion of the American Bottom. In the northern portion of the American Bottom, Sponemann, 1250–1200 B.P., is recognized as the terminal Late Woodland phase. At the end of the Late Woodland period, two distinct cultural traditions, Late Bluff and Pulcher, are recognized in the northern and southern American Bottom, respectively. This distinction continues into the subsequent Emergent Mississippian period.

Contextually, Stemler Bluff, located at the southern end of the American Bottom, falls within the Pulcher tradition's geographic area (Kelly 1990a: 121). To evaluate the Stemler Bluff evidence, the most salient aspects of the southern American Bottom Late Woodland through Mississippian phases are examined beginning with Patrick.

Patrick Phase (1350–1150 B.P.)

The Patrick phase was defined by Fowler and Hall (1975) as the earliest recognizable component excavated at Cahokia. The Patrick phase is defined primarily by a suite of diagnostic material traits, particularly ceramics. Ceramic vessel forms include incurved and inslanted cordmarked subconoidal jars, cordmarked bowls, and miniature plain vessels. Assemblages from Patrick phase components are overwhelmingly dominated by jar forms. At the Dohack site, for instance, jars account for 73 percent of the assemblage while bowls comprise the remaining 27 percent (Stahl 1985). Most vessels are tempered with grit or grog, although crushed limestone occasionally was used. Except for an occasional small lip lug, effigy head, punctation, or incision, jar decoration is limited to impressions along the interior lip margin. These decorations tend to take the form of plain or cordmarked dowel impressions and lip slashes. In general, cord impressions are dominated by "S-twists," but "Z-twist" cord impressions are known and appear to become more common toward the end of the Patrick phase (Kelly, Finney, McElrath, and Ozuk 1984).

Other material culture items known to characterize the Patrick phase include pipes and discoidals. Both of these items have been suggested as representing some ceremonial or recreational activities taking place at Patrick phase sites. Patrick phase lithic assemblages are characterized by the use of raw materials that are predominantly of local origin. Diagnostic projectiles include larger point types like Lowe Flared and Steuben, but small flake points are also present. This occurrence of small flake points has been interpreted as being associated with the spread of a bow and arrow technology (Kelly, Finney, McElrath, and Ozuk 1984). The rather simultaneous occurrence of these small flake points over a broad area again suggests widespread adoption of the bow and arrow at this time (Hall 1980).

Subsistence patterns indicate that a wide range of plant and animal species were procured within close proximity of each site. A variety of wild plants were harvested and processed including nuts, fruits, berries, and tubers. Domesticated plants were also an important part of the Patrick phase subsistence system. Important domesticates include squash, marsh elder, sunflower, goosefoot, smartweed, and maygrass. Maize is present in small quantities but was not yet a dietary staple. Most Late Woodland sites are situated on or near soils suitable for cultivation, and a swidden form of cultivation based on indigenous starchy seeded plants was undertaken (Kelly et al. 1987). Faunal remains suggest aquatic habitats were of great importance; even at upland sites such as Cramer #2, fish remains dominate the faunal assemblage (Cross 1982).

Three types of structures have been identified at Patrick phase sites. The most common has a distinctive keyhole shape with a long entranceway, but rectangular post structures both with and without subterranean basins are also present (Bentz et al. 1988). The post structures that lack subterranean basins are unusual in their large size and are interpreted as ceremonial or communal in nature rather than habitation (Fortier et al. 1984; Kelly et al. 1987). Pit features including earth ovens, storage pits, and refuse pits occur at Patrick phase sites at a very high ratio compared to structures, with one in every ten pit features being an earth oven (Kelly 1990a). Patrick communities include single family homesteads (1 or 2 structures), hamlets (3 to 10 structures), and villages (11 or more structures). Larger Patrick phase sites demonstrate a community pattern of structures surrounding a central feature or complex of features including posts and pits (Fortier et al. 1984; Kelly et al. 1987:427). The planned nature of Patrick phase communities is evidence for the increased nucleation and organization of larger settlements. Residential structures are located around open, communal areas, a pattern also associated with Emergent Mississippian and Mississippian sites.

Patrick phase base settlements are concentrated on the floodplain and alluvial fans of the American Bottom and are viewed as being occupied year round. Archaeologically these large base camps are recognized by their overall size, evidence for permanent structures, and the types and quantity of debris comprising the assemblage. Similar lines of evidence have been used to recognize contemporary extractive seasonal settlements located in the adjacent uplands (Kelly et al. 1987). Based on faunal, floral, and lithic assemblages, it appears that the base camps were fairly autonomous with almost all of their resources being obtainable within 5 km of the settlement. There is no evidence to suggest that settlements were structured in terms of a settlement hierarchy during the Patrick phase (Kelly et al. 1987:425).

Patrick phase mortuary patterns are poorly understood due to the limited number of definable burials attributable to the phase. Milner (1982) recognizes numerous sites in the American Bottom region, particularly those along the bluff line, that have burials associated with Late Woodland and Mississippian diagnostics. However, most have been incompletely reported, detracting from our overall knowledge of mortuary practices. At Patrick phase sites such as the component at Range, most of the recovered human remains are considered to be accidental inclusions in nonmortuary feature fill. Based on current evidence, it appears that the pattern represents the use of a scaffolding burial practice (Kelly et al. 1987), with the final internment occurring away from the habitation areas.

The Emergent Mississippian Period

Juxtaposed between the Late Woodland and Mississippian periods is the short Emergent Mississippian period (1200–950 B.P.). The period defines a transitional unit between the Late Woodland and Mississippian periods (Kelly et al. 1987:212). This period spans a time of rapid cultural change and diversification. Significant characteristics of the Emergent Mississippian are the shift to maize as an important dietary crop, the use of new tempering agents for ceramics, a higher frequency of vessels with incurved necks, higher frequency of Z-twist cordage, a decrease in structure size, a decrease in earth oven frequency, and an increase in the number of large deep pits (Kelly et al. 1987). In addition, ceramic assemblages are more diversified with the addition of stumpware. Ceramic vessels with Madison County Shale paste, originating in the northern American Bottom, are found in the southern portion of the American Bottom, suggesting intraregional trade was taking place (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984). As noted for the end of the Late Woodland, contemporaneous phases are recognized following a north/south geographic division in the American Bottom. In the northern portion of the American Bottom the four phases are Collinsville, Loyd, Merrell, and Edelhardt, from oldest to youngest. In the southern portion of the American Bottom, the four phases are Dohack, Range, George Reeves, and Lindeman. The southern Emergent Mississippian phases are examined here.

Dohack Phase (1150–1100 B.P.)

The Dohack phase (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984) is the initial Emergent Mississippian period phase in the southern American Bottom. Sites with identified Dohack components include Dohack, George Reeves, Joan Carrie, Westpark, Maey's, Divers, and Range (Esarey 1980; Esarey and Johannessen 1994; Fortier 1985a; Freimuth 1970; Kelly 1980; Kelly et al. 1990; McElrath and Finney 1987; Stahl 1985). Ceramics are the primary artifacts used in separating Dohack from Patrick phase occupations.

A major ceramic change that occurred during the Dohack phase is the use of limestone as the principle tempering agent in the southern American Bottom. Ceramic assemblages are dominated by jar forms (50–75 percent), principally those with constricted orifices, with substantially fewer bowls (10–40 percent). Cordmarking varies from extending to the lip to ending at a pronounced shoulder. Jars with plain-surfaced, incurving or inslanting necks and vertical to near vertical rims are common. The pattern of cordage impressed on ceramic vessels is predominantly Z-twist, marking a significant change from the earlier predominance of S-twist cordage patterns during the Late Woodland period. Hall (1980) has suggested that this shift may be reflective of a change to a spindle-whorl technology in cordage manufacture. Jar rims tend to be unmodified and undecorated, but there are occurrences of lip lugs, dowel impressions, and incisions on the interior lip edge of jars. Impressions occur on 30–35 percent of the recovered rims. This frequency is less than that noted for the preceding Patrick phase. Almost no cordwrapped stick impressions occur on the lip area as is often characteristic of Patrick phase assemblages. Bowls invariably have cordmarked exteriors, and there is evidence for a diversity of bowl sizes (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984).

Lithic remains are similar to those of the Patrick phase in that local chert resources dominate the assemblage. Formal tools include large projectile point forms, but small, marginally retouched flake arrow points increase in frequency. Overall, however, the number of diagnostic lithic tools decreases. Projectile points appear to have been made from Burlington chert more frequently than was noted previously. This observation has been used to suggest greater local trade since Burlington is not found in the immediate vicinity of the Range site (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984). Hoes and hoe flakes have been recovered from Dohack features, the initial evidence for their use during the late prehistoric period.

The most apparent departure between the Dohack and Patrick phases involves a shift in the use preparation of maize. While maize occurs infrequently in the American Bottom prior to 1200 B.P., it is found in a majority of Dohack phase features (Johannessen 1984). In fact, the increase in the occurrence of maize played a large role in defining the Emergent Mississippian period. Maize occurs in 50–80 percent of Emergent Mississippian features. This dramatic and rapid increase in maize ubiquity suggests a substantial shift in economic strategies, especially as they relate to horticultural and agricultural activities. Another noteworthy point is that faunal assemblages include a large number of fish elements, even at sites located in the uplands. This indicates that fishing was an important subsistence activity regardless of site location. This fact may have added significance given Smith's (1978) observations for Mississippian subsistence patterns as predicated on the efficient exploitation of seasonally renewed aquatic and riverine habitats.

Individual domestic structures are typically rectilinear, but some keyhole-shaped structures associated with the Dohack phase suggest a continuity with the preceding Patrick phase. Overall, however, structures are slightly smaller than those of the Patrick phase, with an average floor space of 4 m^2 (Kelly 1990b). Nonstructural features are similar to those found in the Patrick phase. Some storage pits, however, are deeper and of greater volume than Patrick phase pits. The frequency of earth ovens to other pits decreases, but the frequency of pits with rectilinear orifices increases.

Information on settlement patterns indicates a slightly more complex system was in place than during the Patrick phase. Villages located in the floodplain constitute the uppermost level of the settlement hierarchy. It appears that small, year-round settlements are located in the uplands. This year-round presence in the uplands contrasts with the Patrick phase when upland sites are viewed as limited-activity extractive loci. At the community level, there are at least two different settlement types. At the Range site, the Dohack and Range phase communities consist of between 10 and 35 structures with an apparent community square in the central site area. Structures are oriented around plazas which often have four deep storage pits and a central post pit as a focal point. The second, less complex community type consists of three to six structures without a community square.

Range Phase (1100–1050 B.P.)

Range is the second Emergent Mississippian phase in the southern American Bottom (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984). Sites with Range components include Fenaia, Westpark, Hamil, and Range (Hendrickson 1979; Kelly et al. 1989; Kelly et al. 1990). Again the principal criteria for the recognition of Range phase sites are based on the ceramic assemblage.

The Range phase ceramic assemblage is similar to that of the Dohack phase, with the exception that there is a dramatic increase in the frequency of jars with plain necks, large bowls, and jars with restricted orifices. Decoratively, lip notching decreases in frequency while lugs become more frequent. Handles and stumpware appear for the first time, indicating a diversification in ceramics from the earlier regional phases. It is also at this time that ceramics manufactured with Madison County Shale paste began to enter the local archaeological record of the southern American Bottom. This finding suggests that intraregional trade was taking place between northern and southern American Bottom populations.

The other components of Range phase archaeological assemblages, including lithics, faunal, and floral remains, demonstrate strong continuity with the Dohack phase. Exceptions, however, include an overall decrease in projectile points, discoidals, and pipes, and decreased utilization of upland nuts and deer. Community trends noted during the Dohack phase also continue. Range phase structures are rectilinear and have a small floor area (3.7 m^2). In addition to residential structures, there are some large single-post-and-basin structures, often located in a central position. These larger buildings evidence internal hearths and rebuilding. The ratio of pits to structures is comparable to the Dohack phase, but the frequency of rectilinear orifice pits increases with respect to those with circular orifices.

George Reeves Phase (1050–1000 B.P.)

George Reeves is the next phase in the southern American Bottom chronology. This phase is recognized at the George Reeves, Range, and Westpark sites (Kelly 1990a; Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984). Changes in ceramic decoration are the best indicators of this phase. In general, the ceramics are similar to the previous phases except for a notable increase in the number of jars with undecorated necks and the presence of completely plain jars. In addition, possible bottles or seed jar prototypes are present, and red filming on ceramics first appears in low frequency. Exterior decorations on jars increase while interior lip impressions disappear. Madison County Shale paste vessels are present in low frequency (<5 percent), suggesting the continuation of intraregional trade.

The lithic assemblages demonstrate a shift in the use of raw materials; high quality Burlington and Mill Creek cherts appearing more frequently than locally available poorer quality Salem cherts. It is during this phase that the first complete hoes are known. Maize occurs in over 70 percent of the George Reeves phase features, and native cultigens such as maygrass, chenopodium, knotweed, sunflower, squash, gourd, and marsh elder continued to be important components of the agricultural system.

The George Reeves phase settlement system consists of different community types including villages, isolated farmsteads, and related small hamlets. Hamlets consist of up to ten structures and are often organized around larger central structures with the smaller structures placed near the periphery of the settlement. There is a continuation of the community plaza concept with the addition of smaller courtyards around the larger central plaza. A majority of these settlements are located in floodplain settings. The structures are rectangular and of a single-post type with basins and both interior and exterior pits. There is a marked decrease in the ratio of pits to structures, and very few earth ovens are present. It is during this phase that the highest frequency of deep straight-wall or expanded-wall pits are known. Houses are larger (5.6 m^2) than previous Emergent Mississippian structures, and there are indications of more specialized structures. Data are not available for defining George Reeves phase mortuary patterns.

Lindeman Phase (1000–950 B.P.)

Lindeman is the last Emergent Mississippian phase defined in the southern American Bottom prior to the Mississippian period. Lindeman component sites include Marcus, Range, Schlemmer, George Reeves, Hamil, and Westpark (Bareis and Porter 1984; Berres 1984; Emerson and Jackson 1987; Kelly 1990b; Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984). As with the preceding Emergent Mississippian phases, ceramic attributes serve as the primary distinguishing characteristic of the Lindeman phase. Ceramics are primarily cordmarked, but there are more vessels with plain surfaces, and some bowls and stumpware are entirely plain. Ceramic decoration includes limited use of punctation, exterior lip notching, effigy lugs, and loop handles. Added to the ceramic assemblages during this period are a variety of red-filmed vessels including bowls, seed jars, and hooded water bottles. A variety of nonlocal shell-tempered ceramics have been found in assemblages dating to this phase, indicating continued interregional exchange.

There appear to be at least three types of settlement during the Lindeman phase, nucleated villages, linear villages, and farmsteads, and sites are found in both the floodplain and the uplands. Village size appears to increase at this time with more than 100 structures recognized at Range. Settlements appear to be arranged around a plaza with four deep central storage pits, similar to the pattern noted for the Range phase. Houses are rectangular, single-post types, but the average floor area increases to 5.8 m^2. In addition to increased floor space, Lindeman phase structures have large interior pits placed near one wall (Kelly 1990b).

Summary

In general, the Emergent Mississippian period in the southern American Bottom witnessed the elaboration and consolidation of social power which was discharged from floodplain mound centers such as the Lunsford-Pulcher site. Such centers served an integrative function between the growing large villages, such as Range, and the numerous small hamlets and farmsteads. Subsistence data indicate that while maize became a dietary staple during the Emergent Mississippian period, it was added to an existing horticultural system rather than replacing it. Following the initial widespread adoption of maize, subsequent changes in the subsistence base are subtle and reflect localized conditions. Johannessen (1993) views the documented change in ceramic assemblages (increasing percentages of bowls and plates, and changes in food storage from a Late Woodland pattern of individual household storage to one that includes communal storage facilities during the George Reeves phase) as reflective of changing sociopolitical relationships during this period. The emergence of ordered community plans, intensification of the agricultural system, and the development of site hierarchies all characterize the approximately 250-year long Emergent Mississippian period.

The Mississippian Period

The Mississippian period, 950–550 B.P. in southwest Illinois, witnessed a sharp increase in cultural complexity and the cultural climax of the Mississippian chiefdoms of the Mississippi River valley. Maize agriculture, which formed the subsistence base for the previous two hundred years, was intensified with large, communal fields planted in the floodplain. A hierarchical settlement system dominated by large mound centers but also integrating a number of smaller hamlets and rural farmsteads emerged and served to link the growing nucleated towns with rural populations. The largest site during the Mississippian period was Cahokia, which reached its peak of sociopolitical power and influence during the Stirling phase, 900–800 B.P. Other mound sites such as Lunsford-Pulcher, East St. Louis, St. Louis, and Mitchell served as gateway centers for the Cahokia-centered American Bottom Mississippian polity. Long-distance exchange networks administered through these large temple-towns were important in maintaining the acquisition, production, and distribution of status goods and exotic materials.

Four phases are defined for the Mississippian period. In the southern American Bottom these phases are Lindhorst, Stirling, Moorehead, and Sand Prairie. Beginning with the Stirling phase, the same phases are defined for the southern and northern American Bottom during the Mississippian period. This is a departure from the previous period, and reflects the integrative power of the Cahokia-centered chiefdom.

Lindhorst Phase (950–900 B.P.)

The Lindhorst phase is the initial Mississippian period phase defined in the southern American Bottom (Kelly 1990a). Excavated sites with Lindhorst phase components include Carbon Dioxide, George Reeves, Range, and Lunsford-Pulcher (Finney 1985; Freimuth 1974; McElrath and Finney 1987; Kelly et al. 1989). Major mound construction activity began at both Cahokia and Lunsford-Pulcher, and the Mound 72 high status burials and retainer sacrifice were interred at Cahokia during this phase. The Lindhorst phase ceramic assemblages demonstrate few substantive changes from the earlier Lindeman phase assemblages. The general trends discussed earlier continue, with cordmarking decreasing and plain-surfaced vessels increasing in frequency. Outflared or thickened lips replace notched lips on jars. Red-filming of bowls, seed jars, and jars continues as a surface treatment. Funnel forms are added to the ceramic assemblage at this time.

Lithic tools are generally produced of high quality cherts such as Burlington, Mill Creek, and Kaolin. Along with the focus on high quality cherts, there is evidence for the production of three types of chert hoes for agricultural use. Distinctive large bifaces such as Ramey knives appear for the first time, and microdrills are introduced into the lithic tool assemblage (Milner et al. 1984). In addition to the presence of locally exotic cherts such as Kaolin and Mill Creek, the presence of *Marginella* shell beads, copper, galena, and other materials attest to the ability of the Cahokia-centered Mississippian polity to access distant raw material resources through exchange relations.

With the construction of mound complexes in the floodplain area at Cahokia and Lunsford-Pulcher, mortuary behavior changed radically during the Lindhorst phase. While little evidence exists for mortuary behavior at habitation sites during this phase, separate elite burial areas have been examined. The best known burial area is Mound 72 from the Cahokia site. At Mound 72, evidence was uncovered for charnel houses, burial pits with grave offerings, human sacrifice, litter burials, and status differences between the various burial treatments (Fowler 1974). Additional mound and nonmound burials probably date to this phase, but further analysis is needed to place them in the proper temporal context.

Little evidence exists to indicate a major change in subsistence at the beginning of the Mississippian period and the established pattern of maize agriculture, hunting, fishing, and gathering continued to provide for subsistence needs. Intensification in agricultural production may be associated with the clearing, planting, and harvesting of large floodplain fields. Such large-scale agricultural efforts were combined with the continued use of small garden plots into an "infield/outfield" system of food production throughout the Mississippian period (Woods 1987).

Lindhorst phase sites are found in both upland and floodplain zones in the southern American Bottom region. Concordant with the growth of the major mound centers is the emergence of a settlement hierarchy in the region. Various site types present at this time include multiple mound centers, single mound centers, villages, and farmsteads. Larger and intermediate-sized communities are organized around a plaza or series of open courtyards. Smaller, isolated households or farmsteads are recognized as the lowest level in the site hierarchy. Typical household structures are built within rectangular basins that are shallower than in previous phases. A major construction change occurred, however, with over 70 percent of the structures having closely set posts in wall trenches rather than individual post construction. Most structures lack large internal storage pits during the Lindhorst phase.

Stirling Phase (900–800 B.P.)

Stirling phase components have been excavated at the BBB Motor, Cahokia, DeMange, Julien, Lab Woofie, Labras Lake, Lily Lake, Lohmann, Mitchell, Range, Sandy Ridge Farm, Robert Schneider, and Turner sites (Emerson and Jackson 1984; Fortier 1985; Jackson 1990; Milner 1983a, 1984a; Norris 1978; Porter 1974; Prentice and Mehrer 1981). In general, the Stirling phase is associated with most of the construction that took place at Cahokia. The Stirling phase also witnessed the initial use of palisades to surround settlements, and appears to be the phase during which Cahokia's influence first extended outside the immediate region of the American Bottom.

Jars make up the majority of the ceramic assemblage (72 percent) with bowls (16 percent), beakers (2.6 percent), water bottles (1 percent), hooded water bottles (1 percent), seed jars (2 percent), juice presses (3 percent), and stumpware (2 percent) comprising the remainder. Jar forms include angled, everted, or rolled rims. In addition, the angled rim variant "thickened" first appears in the local archaeological record. Vessel shoulders are usually angled or curved. Decorative surface treatments include plain vessels, filmed vessels, and filmed vessels with trailed lines. The trailed line vessels generally fall under the Ramey Incised type, marking their earliest occurrence in the American Bottom. Trade ceramics such as Mound Place Incised appear to be slightly more common in assemblages.

Patterns of chert utilization differ little from those described for the preceding Lindhorst phase. Formal lithic tools include many generically described Late Woodland point varieties in addition to the more traditional triangular points. Microdrills, however, become much less common during the Stirling phase. Mill Creek hoes continue to be important in the assemblage. An unusual aspect of the lithic assemblage is the occurrence of bauxite figurines. These figurines, such as the Birger and Keller figurines recovered from the BBB Motor site, incorporate symbolism linked to fertility and agricultural production motifs.

Evidence for subsistence behavior is limited, but it appears that fish and waterfowl exploitation increased at the expense of deer in the subsistence economy. Maize agriculture continued to provide a large portion of the diet.

The number and placement of Stirling phase sites suggests utilization of all environmental zones. The floodplain, in particular, witnessed a major increase in the construction of facilities at mound center sites. Evidence from the large mound centers suggests that residential areas were constructed and placed in accordance with an overall site plan. Spatially discrete groups of features along the slopes and crests of bottomland ridges may represent individual household compounds. Individual structures are rectangular, with over 90 percent consisting of a wall-trench construction style. Structures that deviate from the typical pattern appear to have special corporate or ritual functions. Some of the circular structures dating to the Stirling phase have been interpreted as either above-ground storage facilities or sweat lodges. One trend noted in Stirling phase structures is an increase in size over earlier Mississippian structures. The presence of more numerous large internal storage pits also serves to distinguish Stirling phase structures from those of the preceding Lindhorst phase (Mehrer 1995).

Moorehead Phase (800–700 B.P.)

The Moorehead phase is recognized at the Julien, Mitchell, Powell Tract, and Turner sites (Milner 1983a, 1984a; Porter 1974). This phase represents the climax of Mississippian power and influence in the American Bottom (Fowler and Hall 1975). Settlements continued to consist of the first through fourth line communities defined by Fowler (1974, 1978). These sites are concentrated in the floodplain, with isolated households and small hamlets dispersed across floodplain ridges. Uplands sites also are present during this phase. Larger communities continued to be organized with respect to the major mounds. In some communities, areas that were previously residential appear to have been converted into public areas. Individual house structures are rectangular with wall trenches and large internal storage pits. The average floor space per house increased over that of the Stirling phase.

Shell-tempered jars dominate (70 percent) the ceramic assemblage, but bowls, plates, beakers, short and long-necked water bottles, and juice presses are occasionally found. Seed jars and hooded water bottles are no longer part of the assemblage. Plates, however, were apparently added during the Moorehead phase. Jar rims are variously shaped, but the angled rim, with its thickened and curved variants, dominates the Moorehead phase assemblage. Rims tend to be longer relative to the overall lengths noted for Stirling phase vessels. Plain, filmed, and cordmarked exterior jar surfaces are common, with plain surfaces being the most frequent. Ramey Incised vessels are found in reduced frequency. Shell-tempered, cordmarked jars of the named type Cahokia Cordmarked first appear in ceramic assemblages during this phase. Bowls have distinctive lateral curvature and the rims are angular where insloping sides and horizontally oriented lips intersect. Moorehead phase juice presses are distinct from Stirling phase presses in that they are shell tempered rather than grog tempered. Water bottles with either short or long necks are present during the Moorehead phase.

Lithic assemblages are similar to those of earlier phases. Aside from chert sources, there is evidence for the use of bauxite, hematite, galena, mica, and copper. Projectile points include stemmed, corner notched, side notched, and triangular forms. Microdrills are no longer part of the lithic assemblage.

Sand Prairie Phase (700–550 B.P.)

The Sand Prairie phase is the last Mississippian phase defined in the American Bottom. This phase marks a time thought to represent a significant decline in the overall importance of Cahokia within the American Bottom region (Milner 1986). Sites in the American Bottom recognized as having Sand Prairie components include East St. Louis Stone Quarry, Florence Street, Julien, and Schlemmer (Emerson et al. 1983; Milner 1983b, 1984a). Sand Prairie settlement patterns suggest a dispersal of population in which households occur in small clusters on or near the crests of floodplain ridges. The houses themselves tend to be larger and more regularly square than previous Mississippian houses. These structures continue to be of the wall-trench style, with one or more deep internal storage pits.

The Sand Prairie phase ceramic assemblage is dominated by jars, although this vessel form may make up less than 50 percent of an assemblage at some sites (Milner et al. 1984). Other vessel forms include bowls, water bottles, plates, beakers, and juice presses. Shell tempering predominates, but grog continues as a minor temper type. Virtually all Sand Prairie phase jars display the angled rim form and curved shoulders and plain or cordmarked exterior surfaces. Consistent with the trends noted for the previous phases, rim ratios tend to be increased in length comparative to body size. Constricted orifice bowls are more common in Sand Prairie than previous phases. Water bottles from habitation sites tend to have short to medium-length necks while some long-necked types are found in mortuary contexts.

Sand Prairie lithic assemblages demonstrate tool types and material use patterns similar to those in earlier Mississippian phases. There are few diagnostic lithics to distinguish this phase from the previous phases. Notched excavating tools or hoes, common in earlier Mississippian phases, have not been recovered in Sand Prairie contexts.

Mortuary activities continue to be less evident at floodplain mounds. It appears that mortuary activities were carried out in the confines of individual communities where charnel structures and burials occur on prominent ridges rather than in mounds.

The subsistence pattern noted for most of the preceding Mississippian phases continues unchanged into the Sand Prairie phase. It appears that the major subsistence changes were associated with the widespread adoption of effective maize agriculture during the Emergent Mississippian period, and no major changes took place after that.

Summary

The late prehistoric, from 1650 B.P. to 550 B.P., was an era of rapid cultural change in the American Bottom. Early in the Late Woodland and again during the Mississippian period, the entire region was linked by common archaeological manifestations. The continuity of these two periods stands in stark contrast to the Emergent Mississippian period, when the southern and northern portions of the American Bottom are recognized as following distinct traditions. In the south, the Pulcher tradition is characterized by a predominance of limestone-tempered ceramics while the Late Bluff tradition in the north is characterized by grit/grog- and shell-tempered ceramic assemblages. Aside from ceramic tempering, an entire suite of cultural characteristics changed from the beginning of the Late Woodland Patrick phase to the terminal Mississippian Sand Prairie phase. Important changes in material assemblages include the introduction of new ceramic vessel forms, new decorative styles, and shifts from keyhole to single-post-and-basin to wall-trench structures. The late prehistoric period also witnessed increased complexity in settlement organization and the evolution of site hierarchies, growing agricultural productivity and social inequality, and intensification of sociopolitical and ritual activity. This context of regional continuity and rapid overall change during the period between 1650 and 550 B.P. represents the baseline against which the Stemler Bluff site data can be evaluated.

CHAPTER 3.
RESEARCH GOALS

Upon completion of Phase II testing at 14 sites identified within the Valmeyer relocation area, 11MO891 was recommended as eligible for listing in the NRHP (McGowan 1994; Volume I, this report). In July 1994 the Illinois Historic Preservation Agency concurred with that finding, and the Public Service Archaeology Program was asked to submit a data recovery plan for the Phase III mitigation of 11MO891. Based on the results of the Phase II testing conducted at 11MO891, a number of potential research issues were detailed that could be addressed with data obtained during the Phase III mitigation of the site. The proposed research issues discussed in that document were based on an understanding not only of the data likely to be generated by additional excavations at 11MO891, but also on the state of current Emergent Mississippian-Mississippian period research in the American Bottom and surrounding regions. These research issues are not intended as a comprehensive listing of the research potential of data collected from the mitigation of 11MO891, nor is it intended that the research issues outlined below can necessarily be addressed through the excavation of a single site.

The last two decades have witnessed an explosion in research on Mississippian as a cultural construct in the American Bottom. Propelled by a continuing research program at Cahokia and especially the University of Illinois FAI-270 project that resulted in the excavation of a wide range of smaller Emergent Mississippian and Mississippian period sites both in the floodplain and along the bluff crest of the Mississippi River valley, archaeologists have investigated a wide range of topics. These topics include the reconstruction of, and exploration of diachronic trends in, settlement patterns and settlement systems (Emerson 1992; Fowler 1978; Hall 1991; Kelly 1990a, 1990b; Mehrer 1995; Milner 1990, 1991; Pauketat 1992; Smith 1990; Woods and Holley 1991); internal site structure (Collins and Chalfant 1993; Emerson 1992; Finney 1993; Fowler 1991; Holley et al. 1993; Kelly 1990a, 1990b, 1992; Mehrer 1995; Pauketat 1993); trade, craft specialization, and external relationships (Brain 1991; Emerson 1991; Hall 1991; Kelly 1991a, 1991b; Milner 1991; Peregrine 1991; Smith 1984; Stoltman 1991; Yerkes 1989, 1991); burial patterns and religious ceremonialism (Fowler 1991; Klepinger 1993; Prentice 1986; West 1993; Witty 1993); political economy or sociopolitical structure (Johannessen 1993; Mehrer 1995; Milner 1991; Muller and Stephens 1991; Pauketat 1992; Rindos and Johannessen 1991); and the development or emergence of Mississippian culture (Kelly 1991a, 1991b, 1992), among others. While a large base of data concerning the Emergent Mississippian and Mississippian cultures of the American Bottom region has been obtained in recent decades, the information is biased in favor of sites located in the floodplain proper. Relatively few upland sites have been investigated, and fewer still have been investigated in the uplands at the southern edge of the American Bottom. Data recovered from the Stemler Bluff site thus have the potential to allow comparisons between upland and floodplain sites.

While not grouped according to the above categories, the research goals proposed in the data recovery plan for 11MO891 addressed many of these issues. Based on data collected during the Phase II testing at 11MO891, five general areas were discussed in terms of the site's research potential. These five categories are chronology, site function, use of an adjacent sinkhole, subsistence, and the local Emergent Mississippian to Mississippian period settlement system. Chronology includes both determining internal site chronology at 11MO891 and assessing the data in an attempt to create or refine regional late prehistoric phases or subphases. Site function centers on determining the activities engaged in by site inhabitants and how those activities were spatially organized. This topic includes the nature of the relationship of the mortuary and residential areas of the site. Sinkhole usage addresses a unique aspect of the Valmeyer locality.

Sinkholes are common in the karstic uplands of Monroe County, and one sinkhole is adjacent to and southwest of the Stemler Bluff site. Limited Phase II testing indicated the presence of cultural materials in this sinkhole. Geomorphological investigations conducted during the Phase III investigations were intended to determine the depositional context of this material. Subsistence centers upon the reconstruction of the Mississippian period subsistence strategy employed by the occupants of 11MO891 and includes the analysis of both faunal and archaeobotanical remains. Finally, settlement system analysis is intended to evaluate the role of 11MO891 within the local Mississippian period settlement system. Each of these research goals is discussed to a greater extent below.

Chronology

One of the major goals of the mitigation project undertaken at Stemler Bluff is the recovery of data with which to place the occupation of the site into a temporal and cultural framework. Without such analysis, no meaningful interpretation regarding the nature or function of the site is possible. A precise local chronology linked to regional cultural historical developments is necessary for any broader interpretation of the Stemler Bluff data set. Several means were employed to address the chronologic placement of the Stemler Bluff occupations: the collection of organic materials for radiometric assay, the typological analysis of temporally diagnostic artifact classes, primarily ceramics, and analysis of the type and range of cultural features present at the site. Chronologic data from these absolute and relative methods are needed to integrate the Stemler Bluff data into the existing regional temporal construct. The evaluation of chronometric and typological dates for the site further serves to cross-check the validity of each method of age determination.

Analysis of the ceramic assemblage with regard to vessel form, temper, and surface treatment provides one means of addressing the temporal placement of the Stemler Bluff site occupations. The cultural phases defined for the American Bottom Emergent Mississippian and Mississippian periods are based largely on the quantification of trends in ceramic assemblages through time (Bareis and Porter 1984; Fowler and Hall 1972; Kelly 1990a; Milner et al. 1984). In addition, variation in ceramic assemblage attributes also is known to be present, resulting in distinct northern and southern American Bottom ceramic traditions (e.g., Bareis and Porter 1984; Kelly 1990a). General age determinations were made through typological studies of all temporally diagnostic artifacts with reference to defined types for the region. Contextual information also was important in directing attention to potential instances of artifact contamination or disturbance that could potentially alter interpretations.

Absolute age determinations were obtained through radiocarbon assay of carbonized plant remains, primarily wood charcoal and charred nutshell. Samples of carbonized materials were collected during feature excavation, and those of adequate size and content were selected for possible radiometric age determination. All carbon samples were submitted to Beta Analytic, Inc. for conventional ^{14}C assay. Thirteen radiocarbon dates were obtained from 11MO891 which serve to anchor the site's occupation in both the local and regional chronologic framework. The radiocarbon dates are reported as both conventional age before present (B.P.), calibrated age B.P., and calibrated calendrical age. The two calibrated age estimates reflect advances in chronometric dating techniques that incorporate fluctuations in the atmospheric content of carbon isotopes over time (Stuiver and Reimer 1993; Talma and Vogel 1993; Vogel et al. 1993).

Using the above-noted combination of typological and chronometric dating techniques, the Stemler Bluff site occupations are integrated into the existing Emergent Mississippian and Mississippian period chronological framework for the American Bottom region, permitting the interpretation of the site in its proper archaeological context.

Site Function

The determination of site function can be divided into two related issues: potential activities conducted at 11MO891 and the internal patterning of those activities. Phase II testing at Stemler Bluff yielded artifacts that indicated an occupation during the Emergent Mississippian and Mississippian periods (McGowan 1994; Volume 1 of this report). Emergent Mississippian and Mississippian period site function has been addressed by a number of researchers in the American Bottom (e.g., Collins and Chalfant 1993; Emerson 1992; Finney 1993; Fowler 1991; Holley et al. 1993; Kelly 1990a, 1990b; Mehrer 1995; Pauketat 1993). Documentation of site function draws on a number of different data sets and is itself a source of information for a number of other research issues.

Fowler (1978) identified four site types with regard to Mississippian settlement during the Stirling phase. Emerson (1992) notes that this model may not be appropriate for time periods before the Stirling phase. During the Emergent Mississippian period, moundless communities often were comprised of a number of structures arranged around a central plaza (Kelly 1992). The initial three site categories in the Fowler model contain mounds while the fourth-level communities are moundless farmsteads, hamlets, or villages. Emerson (1992) elaborates on the moundless, fourth-level community concept. Three subtypes are proposed: farmsteads represented by a single structure; nodal communities of four to six structures, often associated with a sweat lodge or communal storage structure; and, finally, a temple/mortuary complex. In addition, Mehrer (1995) has summarized typical rural household organization including a classification of building types for the Emergent Mississippian and Mississippian periods. With data from 11MO891, the site can be compared to the above described model of Emergent Mississippian and Mississippian period site types from the American Bottom. Such a comparison will allow the identification of an appropriate site type and modifications, if appropriate, to these models. Of critical importance to this analysis will be determining the relationship between the residential and mortuary areas of 11MO891.

To address this research goal, two classes of data will be analyzed. The type and quantity of artifacts and ecofacts such as faunal and archaeobotanical remains will be analyzed in an attempt to identify on-site activities. In addition, the spatial patterning of the artifacts and ecofacts within features, as well as the spatial patterning of the features themselves, will be analyzed. Based on the model discussed above, 11MO891 is expected to be the result of temporally discrete hamlet or farmstead occupations, although the presence of the mortuary area would be unique for those two site types. Comparison to features from other excavated sites and analysis of materials from the features can be used to identify feature function while archaeobotanical and faunal analyses will be used to identify major diet-related activities at the site. Faunal and archaeobotanical analyses also may be used to identify the seasons of occupation at 11MO891. The results of these analyses then can be compared to sites located on the floodplain to address issues of potential differences in the use of the floodplain and uplands during the Emergent Mississippian and Mississippian period. Additionally, data from this research issue will be used to evaluate Emergent Mississippian and Mississippian period settlement systems, a research issue that is discussed below.

Sinkhole Usage

During the Phase II testing at Stemler Bluff archaeological material was located in a sinkhole located at the southwest edge of the site (McGowan 1994; Volume I, this report). Sinkholes represent potentially rich and unique data sets for the investigation of issues regarding the prehistoric occupation of a site as well as general questions about changing environmental conditions in the area (Butzer 1982). It has been argued that similar features such as upland bogs and glacial kettle lakes were utilized by prehistoric groups in the Midwest to exploit rich aquatic plant and animal resources (e.g., Carmichael 1977; Ferguson and Warren 1993; Hart and Jeske 1991; Kurz 1986). Botanical and faunal remains from the sinkhole could provide information about potential resources available during the prehistoric occupation of Stemler Bluff, and it was expected that archaeological material found in the sinkhole would assist in understanding site function.

Major research questions addressed during Phase III work at 11MO891 concerned the origin and geomorphic history of the sinkhole and its potential use by prehistoric groups. The results of an Illinois Geological Survey boring provided a description of the major geological deposits within this feature. These indicate that the sinkhole contains over 60 feet of unconsolidated sediments over limestone (Erdmann and Bauer 1993). From top to bottom these sediments consist of Wisconsinan through Holocene alluvial/colluvial deposits, Peoria Loess, Roxana Silt, and Sangamon Soil. From an archaeological perspective, key issues to be addressed are whether the sinkhole was a water-filled basin during the Late Woodland through Mississippian periods and how and when artifacts were deposited. To investigate these questions, more detailed examination of the Holocene deposits was necessary. To facilitate such investigations, the sinkhole was trenched and examined by a geomorphologist. It was thought that analysis of sediments and botanical and faunal remains would permit detailed description of the age, genesis, and history of this feature. Further, palynological data, if preserved, were to be used in analysis of pre-midden, midden, and post-midden deposits to determine if the environment around the sinkhole had changed through time. It was thought that this information would provide a better idea of human impact on the area and why the site was abandoned.

Subsistence

Research on Emergent Mississippian and Mississippian period subsistence patterns at 11MO891 draws on archaeobotanical and faunal remains. This research topic has two immediate goals: first, to identify subsistence resources captured, collected, or grown by the occupants of the Stemler Bluff site and, when possible, to distinguish those resources by time period, and second, to compare the Stemler Bluff subsistence resources to those identified at other American Bottom sites. This latter issue will center on a comparison between upland and floodplain sites of similar periods of occupation. Recent research has suggested a difference in approaches to the exploitation of subsistence resources between upland and floodplain Emergent Mississippian and Mississippian period populations in and adjacent to the American Bottom (e.g., Holt 1996).

In general, the faunal record of the American Bottom for the Emergent Mississippian and Mississippian period is poor due to a lack of bone preservation. Kelly and Cross (1984) provide a sketch of faunal exploitation studies based mainly on information from floodplain and upland sites while Parmalee (1957, 1975) and Kelly (1979) have conducted analyses of assemblages from Cahokia. In general, most assemblages are dominated by fish, particularly catfish, suckers, and sunfish. Fish often comprise up to 80 percent of Emergent Mississippian period assemblages. An exception to this pattern is the AG Church site located in the uplands east of Cahokia where mammals dominate the assemblage. This difference is interpreted to be due to season of occupation (Holt 1996). Birds are typically next most common, with waterfowl and terrestrial species such as turkey and prairie chicken important. Mammal remains are less common, although deer is the single most important species in this class. This pattern, with a few exceptions, characterizes the succeeding Mississippian period. Fish remains comprise 50 to 75 percent of the Mississippian period faunal assemblages, and there is an increase in the exploitation of terrestrial bird species. The analysis of faunal remains from 11MO891 can be compared to this model of faunal exploitation from the American Bottom region. The analysis also can potentially provide details on site function, season of occupation, and the role of 11MO891 in the local settlement system.

Archaeobotanical information generated through the systematic collection, processing, and analysis of flotation samples will permit the investigation of a variety of topics related to patterns of plant exploitation at this upland site. The archaeobotanical data generated by the FAI-270 archaeological mitigation project provides a baseline for the evaluation of the Stemler Bluff site assemblage. While weighted towards floodplain site assemblages, a number of trends in plant usage are documented for the late prehistoric period in the American Bottom region that are expected to be expressed in a similar manner in this upland setting.

The overall trends noted in plant usage during the Emergent Mississippian and Mississippian periods in the American Bottom region involve two interrelated processes: a decrease in wild gathered or collected plant foods and their replacement by the products of horticultural and gardening activities, and the abrupt addition of maize agriculture at around 1150 to 1200 B.P. The decrease in gathered foods as major dietary components began during the Middle Woodland period. While wild plants became less important, the cultivation and harvesting of starchy-seeded native annuals such as maygrass (*Phalaris caroliniana*), erect knotweed (*Polygonum erectum*), and goosefoot (*Chenopodium* spp.) began. These native plants, along with sunflower (*Helianthus annuus*), sumpweed (*Iva annua*), possibly little barley (*Hordeum pusillum*), and several other grasses apparently increased in dietary importance. Seeds of starchy-seeded species are commonly recovered at sites in the riverine midcontinent, and their presence has been accepted as evidence of increasing horticultural reliance by many Woodland populations occupying diverse environmental settings (Asch and Asch 1985a; Fritz 1993; Johannessen 1984, 1988, 1993; Rindos and Johannessen 1991; Smith 1992). The growing reliance on the products of gardening and horticultural systems is likely responsible for the observed decrease in the use of nuts.

Maize became a common component in American Bottom subsistence strategies during the Emergent Mississippian Dohack phase (1150–1100 B.P.), where it is present in approximately 50 percent of analyzed features. Earlier components dating to the Middle Woodland period (Riley et al. 1994; Fritz 1993) and the Late Woodland Patrick phase (Johannessen 1993) have produced small quantities of maize, but it is not likely to have been a significant dietary staple during those periods. The rapidity with which maize became widespread in the ninth century, however, indicates a familiarity with plant cultivation systems not only in the American Bottom but across much of the midcontinent. The existence of incipient horticulture during the Late Archaic period in portions of eastern North America and the subsequent intensification of horticultural activities during the Middle and Late Woodland periods, in a sense preadapted human groups to the ready adoption of productive strains of maize. Not only was maize cultivation incorporated into the subsistence base, but the starchy and oily seeded native cultigens were retained as important components of the horticultural system (Rindos and Johannessen 1991). Thus, while the adoption of maize agriculture around 1150 B.P. was undoubtedly an important component of the emergence of Mississippian societies in the American Bottom region, the stability of the preexisting horticultural complex characterizes the following several hundred years of prehistoric occupation in the area.

Analysis of the Stemler Bluff site archaeobotanical assemblage potentially can provide an upland perspective on patterns of plant usage during the Emergent Mississippian and Mississippian periods. Upland groups may have relied on a different mixture of cultivated and wild plant foods when compared with contemporary floodplain populations given the differential access to high-quality agricultural soils. If this is the case, do the components of the aboriginal horticultural complex comprise a higher percentage of the diet in the uplands than in the floodplain? Or, are upland groups more reliant on wild foods such as hickory nuts, fruits, and berries? Comparison of the Stemler Bluff assemblage with those from other upland sites such as George Reeves (McElrath and Finney 1987) and Joan Carrie (Esarey and Johannessen 1994) also may permit an exploration of possible variation in upland subsistence behaviors. Seasonality of occupation may be apparent in the composition of the botanical remains, although the storability of both maize and native seed taxa could impair an analysis of seasonality. Wild plant foods, if present, could provide more reliable data on seasonality. The nature of maize remains also may provide information on maize consumption. For instance, if only fragments of maize kernels and isolated cupules are recovered, it could be interpreted that maize may have been transported to the site from floodplain fields. Finally, if a significant portion of the cultural features excavated at the site can be assigned to cultural phases, the archaeobotanical assemblage may be utilized to examine temporal differences in plant exploitation during the Emergent Mississippian and Mississippian periods.

Settlement System

One of the main research goals of the Phase III mitigation at Stemler Bluff is the integration of site occupation into a local settlement system composed of different sites and site types. Patterning of site location across the landscape, differences in site size, density of occupational debris, the presence of specialized tool or feature categories, and the nature of subsistence remains all have been used in attempts at defining prehistoric settlement systems. In attempting to place the 11MO891 occupations into local and regional Emergent Mississippian and Mississippian settlement systems, the consideration of a number of data sets is necessary. Previous research into Emergent Mississippian and Mississippian settlement systems in the major river valleys in the midcontinent has suggested that there is a range of localized settlement systems that is, in part, dictated by environmental factors.

Given the presence of a large number of Mississippian sites within the lower and middle Mississippi River valley and the lower Ohio River valley, previous attempts at explaining settlement systems have focused on the apparent Mississippian adaptation to alluvial settings (e.g., Clay 1976; Muller 1986; Smith 1978). Smith (1978) proposes that Mississippian settlement patterns could be understood by focusing on the particular habitats represented within these alluvial valley settings. Specifically, he proposes that Mississippian populations occupied floodplain zones characterized by linear, circumscribed distributions of plant and animal communities along natural levees and their intervening backwater and slackwater habitats. The Mississippian adaptation to these linear bands of floodplain habitat are believed to have been structured around the acquisition of a restricted range of wild plant and animal resources: backwater fish species; migratory waterfowl; deer, racoon, and turkey; wild nuts and berries; and various adventive plants such as *Polygonum* and *Chenopodium*. In addition to the exploitation of these seasonally available and renewable resources, Mississippian systems also relied on the presence of suitable alluvial soils for the cultivation of maize, squash, and a number of domesticated or semidomesticated native plant taxa. Thus, for Smith (1978:479–486), Mississippian cultural expressions are essentially defined on the basis of their adaptation to a particular suite of environmental variables and their exploitation of a narrow ecological niche.

In examining the nature of sociopolitical, economic, and demographic changes that mark the Emergent Mississippian and Mississippian periods in the American Bottom region after about 1200 B.P., Kelly (1990a) summarizes the developments that serve to distinguish these periods from their Late Woodland antecedents. Viewing the rise of Mississippian in the region as the result of in situ developmental processes from a Late Woodland cultural base, Kelly proposes that the interplay of a growing population, the need for greater amounts of cultivated soils following the addition of maize into the horticultural system, and the resultant need for kin-based supracommunity authority to mediate territorial conflicts, led to the rise of Emergent Mississippian and Mississippian society. The development of two ceramic traditions, Late Bluff in the north and Pulcher in the south, that characterizes the post-Late Woodland American Bottom suggests that social and/or ethnic distinctions played an important role in later developments in the region. The Emergent Mississippian pattern of small villages with structures often arranged around open, central plazas and a large, public structure, as seen at Range, undergoes a major reformation with the beginning of the Mississippian period. The outlying small, nucleated villages of the Emergent Mississippian are replaced by small isolated farmsteads consisting of one or a few structures and associated processing and storage pits. Special purpose structures, including both large, public structures and sweat lodges, are sometimes present in nodal communities. This settlement reorganization may reflect the formation of increasingly effective means of corporate mediation of conflicts and the integration of a number of dispersed farmsteads into a diffuse community composed of a number of smaller components as Mississippian sociopolitical developments on the American Bottom became dominated by Cahokia (Milner 1991).

Along with these broadly focused approaches to defining Mississippian culture and its settlement system attributes, more regional-specific models have been proposed for the American Bottom and its flanking uplands (Emerson 1992; Fowler 1978; Hall 1991; Kelly 1990a, 1990b; Mehrer 1995; Milner 1990, 1991; Pauketat 1992; Woods 1987; Woods and Holley 1991). In an overview of American Bottom Mississippian settlement, Fowler (1978) defines four categories of settlement based upon site size, internal complexity, and the presence/absence of mounds. This four-tiered model is topped by Cahokia, the most complex site throughout the Mississippian period. Second-line communities have multiple mounds and cover more than 50 ha. Four sites, Mitchell, Lunsford-Pulcher, East St. Louis, and the St. Louis mound groups, are assigned to this category. These sites are located to the north, west, and south of Cahokia. Third-line communities are those with a single mound and associated habitation areas. The least complex sites, termed fourth-line communities, are small hamlets or farmsteads without mounds. In addition to displaying readily apparent differences in size and internal complexity, the above-defined site types also appear to have distinct, patterned distributions across the American Bottom landscape. The small hamlets and farmsteads appear to have the broadest distribution, generally along productive aquatic resource zones and, as is becoming increasingly apparent with additional archaeological investigations, in the upland margins of the valley. Single-mound communities are located adjacent to major floodplain lakes and may have served as specialized locales tied to other nearby communities. The larger multimound communities all appear to be located with respect to access to the Mississippi River channel and may have operated as gateway communities. This four-tier model of Mississippian site categorization lends itself to the proposal of a hierarchical organization within a chiefdom-level sociopolitical entity.

More recent research by Emerson (1992) on the role of the fourth-line communities in the American Bottom during the Stirling phase (900–800 B.P.) supports the trends noted by Milner (1991) and has led to a greater understanding of the role these small, dispersed sites. Emerson proposes that fourth-line communities can be divided functionally into components of a dispersed village settlement. Functionally, three site types are recognized in this model: farmsteads or households composed of one or a few related structures and associated features; nodal hamlets where communal facilities such as sweat lodges and storage structures are added to the residential component; and temple/mortuary complexes where specialized ritual activities are undertaken. The resultant dispersed village is conceptualized as being composed of these distinct site types within definite territorial boundaries. The integrating forces holding the dispersed villages together include social, political, economic, and religious relationships between the various components. This dispersed village settlement model formulated for the Stirling phase also posits that while sites such as Cahokia and Mitchell contained dense, nucleated settlement, the bulk of the population was dispersed across the American Bottom landscape. Such a dispersion of population also fits well with models of Mississippian agricultural practices that included both communal cultivation of large, low-lying fields and numerous small plots situated adjacent to the dispersed households. The low-lying communal fields would be most at risk from seasonal floods while those associated with households were generally located on higher, better-drained floodplain ridges (Emerson 1992:206–210).

Far less is understood about the nature of Emergent Mississippian and Mississippian settlement in the uplands and the relationship between floodplain and upland sites. While a small number of upland margin sites with Emergent Mississippian or Mississippian components, such as McLean (McElrath 1986), Greenhouse (Wolforth 1992), Holdener (Wittry et al. 1994), George Reeves (McElrath and Finney 1987), and Joan Carrie (Esarey 1980; Esarey and Johannessen 1994) have been investigated, the dynamics and nature of the interactions between floodplain and upland settlements remain poorly understood.

Summarizing available upland site survey data, Woods and Holley (1991) describe the Mississippian occupations of the uplands east of the American Bottom as generally paralleling developments on the floodplain. The distinction between the limestone-tempered ceramic tradition of the southern portion of the American Bottom and the varied temper ceramic assemblages common in the north is replicated, with the Prairie Du Pont Creek drainage serving as the dividing line between the two traditions. Site locations in the uplands appear to be influenced by the presence of nonacidic silt loam soils, particularly Wakeland silt loam. These alluvial soils provide the optimum nutrient availability and ease of tillage best suited to aboriginal agriculture. The Wakeland soils occur primarily along Silver and Richland Creek drainages, among others, and along portions of the bluff base in Monroe County (Higgins 1987). In Madison and St. Clair counties, site survey has indicated that upland Mississippian sites are almost always located within 100 m of Wakeland soils (Woods 1987). Several sites, however, do not conform to the general model and instead are located along upland drainage divides. These sites, including Dugan Airfield (11MO718) located south of Waterloo, exhibit intensive Mississippian occupations and may have been important in regulating exchange and communication between sites located in the floodplain and those in the uplands (Woods and Holley 1991; Woods and Mitchell 1978). In addition, upland site density appears to decline as Cahokia reached its maximal integrative power during the Stirling phase. During that phase populations shift to the surrounding floodplain, only to reappear again in the uplands as the integrative influence of Cahokia began to falter in the Moorehead phase.

Upland sites are generally smaller and include fewer structures than contemporaneous floodplain sites during the Mississippian period, suggesting that these site types held differing roles within the settlement system. Data from Joan Carrie indicate that utilization of this upland margin site was on a seasonal basis (Esarey and Johannessen 1994), perhaps a pattern that will be replicated at other upland sites with additional research. The existence of possible nodal sites such as Dugan Airfield in the uplands east of the floodplain can be taken, however, as an indication that a set of relationships between small upland sites similar to that proposed by Emerson (1992) among low-order floodplain sites was present. In addition, the existence of several multimound centers such as Emerald and Halliday in the uplands east of the American Bottom during the early Mississippian period may indicate that these mound centers served to integrate dispersed upland farmsteads and hamlets into a larger Cahokia-based sociopolitical system (Koldehoff et al. 1993). The apparent decline in occupation at Emerald during the late Stirling and Moorehead phases, followed by renewed occupation and mound construction at Emerald, Copper, and Kuhn also located in the Silver Creek drainage, during the late Mississippian period reflects the declining influence emanating from Cahokia. Thus, while some upland Emergent Mississippian and Mississippian sites may have been seasonally occupied, the existence of multimound centers with associated habitation and mortuary areas suggests a high degree of residential permanence at some upland sites in the region.

A second aspect of settlement to be considered is the mortuary area at Stemler Bluff. Changes in community structure and settlement systems during the course of the Emergent Mississippian and Mississippian periods are paralleled by changes in burial patterns. Mortuary behavior during the Emergent Mississippian period of the American Bottom region is poorly understood (Kelly et al.1990). Human remains dating to this period are scarce and consist only of isolated skeletal elements found as incidental feature fill. More detailed burial data for this period have been derived from recent work along the northeast edge of the Ozarks in Missouri, immediately west of the Mississippi River and the American Bottom region and approximately 30 km west of Stemler Bluff (Collins and Henning 1996). There, the Big River phase, defined on the basis of materials from the Bonaker site, is recognized as an admixture of Late Woodland and American Bottom Emergent Mississippian features. Burials associated with this phase consist of stone-box graves found within habitation areas and in distinct, segregated cemeteries. A large feature identified as a charnel house is also present at this site. The practice of establishing circumscribed cemeteries and ritual structures such as charnel houses is characteristic of the Mississippian period, and the evidence from northeast Missouri suggests that this pattern developed during the Emergent Mississippian period in the American Bottom region. The example from the Bonaker site in northeast Missouri, with its discrete burial ground and charnel structure, is similar to the nonelite peripheral cemeteries characteristic of the American Bottom Mississippian period. The burial data, while limited, suggest that during the Emergent Mississippian a pattern of increased integration of dispersed autonomous settlements existed.

By the Mississippian period there is abundant mortuary behavior data for the American Bottom, and the variability in burial patterns is believed to reflect status distinctions in Mississippian society (Milner 1984b). Three types of cemeteries are characteristic of the Mississippian period: nonelite peripheral cemeteries, nonelite cemeteries in town and mound centers, and elite burials in town and mound centers. Nonelite peripheral cemeteries are commonly found on relatively inaccessible bluffs overlooking the American Bottom and are located away from habitation areas. In floodplain settings, such cemeteries are located on relatively high ridges, close to, but separate from, habitation areas. These cemeteries are characterized by a highly structured internal organization and include individuals of both sexes and all ages. They are often associated with charnel structures and may represent centrally located burial grounds designed to integrate dispersed, autonomous residential communities. Nonelite cemeteries associated with regional centers consist of burials in spatially discrete areas, often in close proximity to mounds. While the internal organization of such cemeteries is analogous to that of nonelite cemeteries, the location of the former in regional centers is believed to reflect the higher status of the interred individuals. Such cemeteries are known from the areas immediately east and northeast of Monk's Mound at Cahokia, and from the Kruger Bone Bank and Fingerhut sites to the west of Cahokia. Elite cemeteries at regional centers consist exclusively of burial of adult burials in mounds with exotic artifacts. The early Mississippian burials in Mound 72 at Cahokia are an example of such elite interments.

The task of evaluating the settlement system within which the occupations at Stemler Bluff were components requires not only an understanding of the nature of each of the components present at the site, but also a clear understanding of the temporal parameters of the components, spatial and temporal variation in feature types, and the composition of the ceramic, lithic, faunal, and archaeobotanical assemblages. Considering these various categories of archaeological data within the context of prior investigations in the American Bottom region, the mitigation of the Stemler Bluff site may lead to a fuller understanding of the variation in late prehistoric culture within the American Bottom region. Specifically, avenues of potential investigation include the exploration of upland versus floodplain settlement dynamics, differences in the focus or intensity of subsistence-related activities between the floodplain and uplands, and potential variation in settlement permanence, size, and degree of population mobility between the floodplain and uplands. The association of the burial and habitation areas of the site, and of the burial area to other nearby sites, also is considered. These and other issues pertaining to settlement behavior potentially may be addressed through careful analysis of data collected at the Stemler Bluff site.

CHAPTER 4.
EXCAVATION RESULTS AND FEATURE DESCRIPTIONS

During the Phase II portion of the Valmeyer Relocation project, a systematic surface collection of 51,300 m^2 within Addition 1 North led to the definition of the 11MO891 site area (McGowan 1994; Volume 1, this report). Based on the controlled surface collection and posthole tests, maximal site dimensions of 300 m east-west by 180 m north-south, or ca. 4.2 ha within a triangular or wedge-shaped area, were defined (Volume 1, this report). Surface materials were found along the southwest edge of a broad upland ridge. A sinkhole was present to the southwest, and a standing farmhouse was located adjacent to and south of the site area. Subsurface integrity was investigated through machine-trench and deep-trenching excavations. Ten machine trenches, totaling 797 m^2, were excavated across the site area. During the machine-trench excavations eight features, including pits, a rectangular structure, and a mortuary feature (Features 9, 10, 11, 13, 14, 15, and 19), and a potential midden deposit (Feature 12) were identified. The potential midden deposit was located within the sinkhole adjacent to the site area. The features uncovered were all located in the northern portion of the site. Artifacts collected during the controlled surface collection and from features excavated during the Phase II investigations and feature morphology suggested an Emergent Mississippian or Mississippian period of site occupation. Based on the presence of intact subsurface features, this site was recommended as eligible for listing in the NRHP, and Phase III mitigation of the site area was recommended. The Phase III mitigation of 11MO891 focused on total documentation and recovery of in situ cultural remains and examination of the nature of the potential midden deposit in the sinkhole.

Two excavation methods were used during the Phase III mitigation of the Stemler Bluff site (Figure 4-1). First, investigations in the main site area, located in a roughly crescent-shaped arc to the north and east of the sinkhole on an upland ridge, were conducted by stripping approximately 25,000 m^2 from five excavation blocks with a pan belly scraper. Surface distribution of artifacts and the locations of features identified during the Phase II investigations were used to determine areas to strip. Surface stripping continued outward from areas of feature concentrations until areas lacking features were encountered, mainly along the periphery of the site area. The second excavation method was the use of a backhoe to excavate four blocks within the sinkhole. Initially, a backhoe was used to excavate recent alluvial/colluvial deposits that mantled the sinkhole. The backhoe excavations continued until midden-like deposits, noted during the Phase II investigations, were encountered. Formal 1-x-2-m test units then were hand-excavated in three of the four blocks until culturally sterile soils were encountered. This allowed both the recovery of artifacts in a controlled manner from the sinkhole and the examination of soil profiles. Combined, the two methods were used to investigate approximately 32,000 m^2, or 75 percent, of the site area. The remaining area lies at the periphery of the site and had only a light density of artifacts and no features.

This chapter examines several facets of the 11MO891 mitigation project. It provides a summary of results of both the surface stripping along the upland ridge and the block/test unit excavations within the sinkhole. Following that is a discussion of the features identified during the mitigation of 11MO891. This includes a discussion of feature types present, their potential function, and a spatial analysis of the distribution of features at the Stemler Bluff site. Finally, the results of the radiocarbon assays are presented.

Main Site Area Excavations

Five excavation blocks, totaling approximately 25,000 m^2 in area, were examined at the Stemler Bluff site (Figure 4-1). All five of the excavation blocks had plow-zone soils stripped by a pan belly

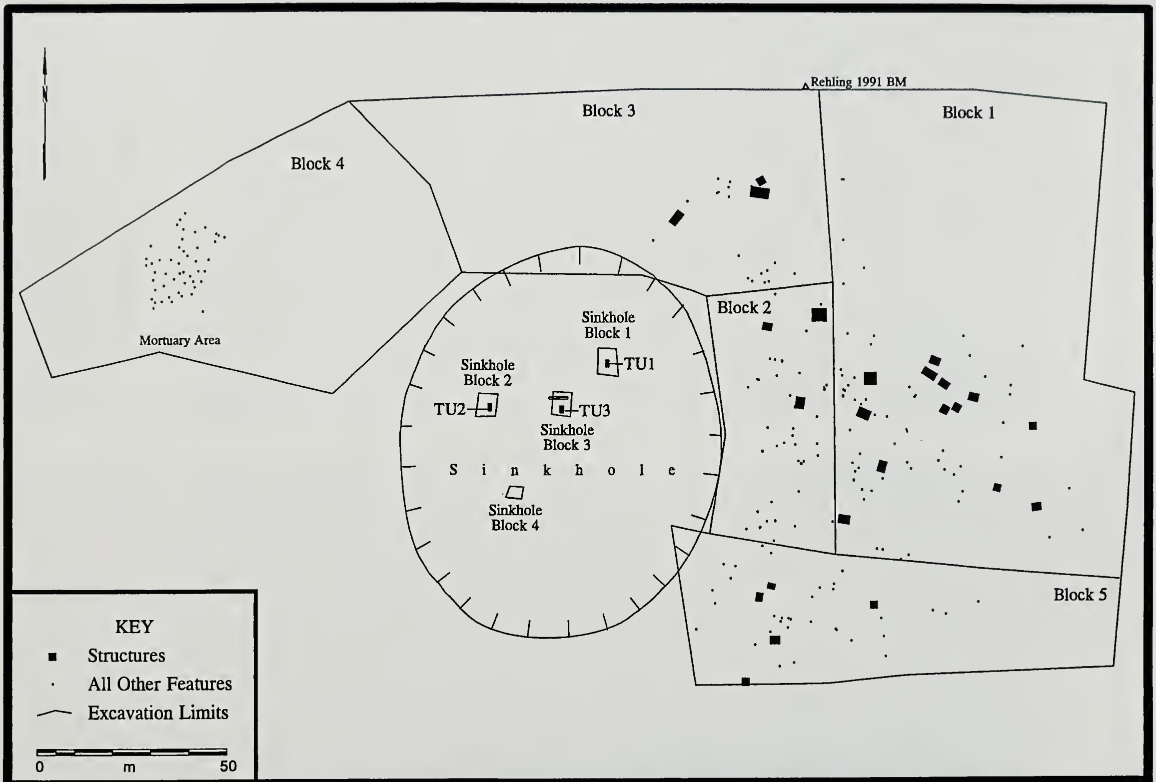

Figure 4-1. Excavations at the Stemler Bluff Site.

scraper. The subsurface exposures were examined visually and shovel scraped in order to recover selected artifacts and to identify areas of soil discoloration and charcoal or artifact concentrations. All excavation blocks were stripped to at least 20 cm below the base of the plow zone. In general, features ringed the east side of the sinkhole and extended eastward, especially in the southeast part of the site. A second concentration of features, all related to prehistoric mortuary activity, was located on a ridge to the northwest of the sinkhole. After the excavation of features identified during the initial stripping of a block had been completed, the area was restripped. Any additional features identified then were excavated. Stripping was discontinued once no additional features were located.

Excavation Block 1, roughly rectangular in shape, measured approximately 118 m north-south by 73 to 76 m east-west and was located in the northeast corner of the site. A dense concentration of features was identified in the southern half of this excavation block, with feature density decreasing to the east and north. Excavation Block 2, also rectangular, was located to the west of Excavation Block 1 and east of the sinkhole. This block measured approximately 64 m north-south by 33 m east-west and contained a dense concentration of features that continued into adjacent excavation blocks. Features were not present along the downward slope of the sinkhole. Excavation Block 3 is in the north-central part of the site between Excavation Block 1 to the east, Excavation Block 4 to the west, and the sinkhole to the south. This roughly rectangular block is approximately 103 m east-west by 48 m north-south. Features were present only in the southeast part of this block. Excavation Block 4 is an irregularly shaped block in the extreme northwest part of the site. This block, measuring maximally 87 m southwest-northeast by 51 m northwest-southeast, is bordered on the east by Excavation Block 3 and on the southeast by the sinkhole. This block contained the mortuary features located at the Stemler Bluff site. Excavation Block 5 forms the southeast boundary of the excavated area. This rectangular excavation block measures 109 m east-west by 29 m north-south. To its north are Excavation Blocks 1 and 2, to the northwest is the sinkhole, and to the south and east is the historic farmstead area. Features were present in this block from the sinkhole to the east.

During the Phase III mitigation of 11MO891, 218 prehistoric cultural features were identified and excavated after being exposed during the machine stripping of plow zone and upper subplow-zone deposits (Figure 4-1). Most features were clearly distinguishable as dark soil discolorations against the lighter subplow-zone soil. The features represent a number of different types including shallow, medium, and deep basin-shaped pits, bell-shaped pits, isolated post molds, single-post-and-basin structures, wall-trench structures, mortuary features, and amorphous or unidentifiable feature types. The majority of these features date to the Emergent Mississippian or Mississippian periods, although a single feature has been dated to the Late Woodland period as well. Temporal data were lacking for a minority of the features.

The features appear to be the remains of two distinct, although interrelated, parts of an Emergent Mississippian and Mississippian period settlement system. The first consists of a series of residential structures and related pit features located to the east of the sinkhole. These features represent a fourth-line community of either a single household or two to three households living on a year-round basis at this locale. A community existed at this locale through much of the later Emergent Mississippian and Mississippian periods, although spans of time may have passed when the area was unoccupied. By the later Mississippian period, a single household farmstead was present at this locale. The second part is the cluster of mortuary features, including human remains, located west of the residential area and northwest of the sinkhole. Dating of the use of the cemetery area is less certain, although it is likely to coincide with the late Emergent Mississippian to early portion of the Mississippian period and may contain late Mississippian period interments as well.

These two components of the site appear to have been viewed as conceptually distinct by the prehistoric inhabitants of the Stemler Bluff site. Over 110 m separate the westernmost residential features from the mortuary features, and virtually no habitation debris was found in the mortuary area of the site. It is also likely that some degree of planning or organization is represented by the mortuary features. Most are oriented southwest to northeast, and there is a total lack of superpositioning of features within the mortuary portion of the Stemler Bluff site.

The remainder of this chapter presents the results of the sinkhole investigations, an analysis of the features identified, and the radiocarbon dates obtained for the Stemler Bluff site. A detailed discussion of the mortuary features is presented in Chapter 8. Analyses of artifact classes recovered from the features follows this chapter. Appendix A contains detailed data on each of the features excavated.

Sinkhole Investigations

The Stemler Bluff site is located on an a upland ridge adjacent to a relatively large sinkhole along the western edge of the habitation area (Figure 4-1). There is more than 5 m of relief between the top of the ridge and the base of the sinkhole while the sinkhole itself exhibits about 2 m of relief. Presumably, sinkhole relief was greater during prehistoric times. However, according to Erdmann and Bauer (1993), historic agricultural practices have increased sinkhole infilling such that many sinks are barely discernable in the Valmeyer relocation parcel.

Investigations were conducted to assess prehistoric use of the sinkhole during the initial Phase II testing conducted at 11MO891 (McGowan 1994; Volume 1, this report). Phase II trench excavations in the sinkhole revealed a buried, artifact-bearing organic horizon. The main goal of the Phase III sinkhole study was to assess artifact density and contextual integrity, in other words, whether the artifacts recovered were in an in situ soil or a redeposited sediment. This goal was accomplished, in part, with the excavation of four small block units at the base of the sinkhole (Figure 4-1). The machine-excavated blocks measured 7-x-5 m (Sinkhole Block 1), 6-x-5 m (Sinkhole Block 2), 6-x-4 m (Sinkhole Block 3), and 4-x-3 m (Sinkhole Block 4) in size. The blocks were excavated to 70–90 cm below the surface of the sinkhole or to the top of the dark, humus-rich horizon. Individual test units (1 through 3), measuring 1-x-2 m in size, then were had excavated at the base of Sinkhole Blocks 1–3 (Figure 4-1). The test units were excavated and material was collected in arbitrary 10-cm levels to the base of the organic horizon. All sediments were screened through 6.4-mm hardware cloth. Total depth of test-unit excavation ranged from 32–58 cm while total depth of Phase III testing ranged from 1.2–1.5 m below the base of the sinkhole. The three-test unit excavations, together with the 1.8 m deep Phase II investigations, provide a cross section of nearly the entire sinkhole.

The sinkhole excavations revealed four major strata (Figure 4-2). The upper 80 cm of sediment (Stratum I) consists of dark yellowish brown (10YR4/4 and 10YR3/6) silt loam with light gray mottles, yellowish brown silt laminations, and yellowish brown silty clay loam soil inclusions. Stratum I is culturally sterile and abruptly overlies a brown (10YR5/3) silt loam sediment (Stratum II) that averages 40 cm in thickness. Stratum II, which darkens in color with depth, contains silt lenses and artifacts. An abrupt boundary separates Stratum II from the underlying sediment (Stratum III). Stratum III is dark grayish brown (10YR4/2) silt loam with light gray silt laminations. It is , on average, 30 cm thick and contains prehistoric and historic artifacts. An abrupt boundary separates Stratum III from the underlying yellowish brown (10YR5/8) silty clay loam material (Stratum IV). Stratum IV, which does not contain silt laminations, exhibits weak soil structure and is culturally sterile.

The sinkhole profile demonstrates that the cultural materials concentrated in the darker zones

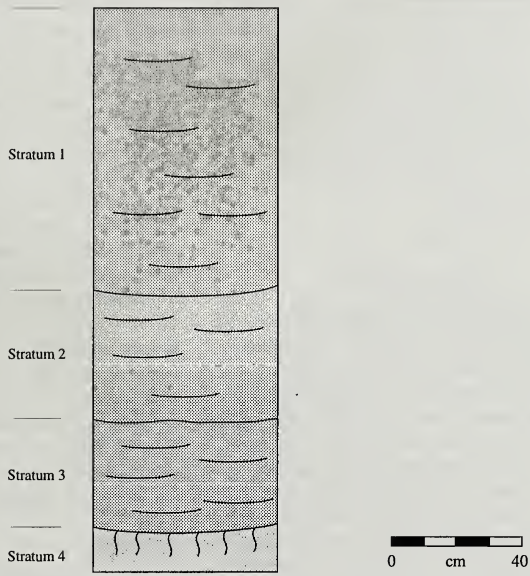

Figure 4-2. Composite Profile of the Sinkhole.

(Strata II and III) are redeposited. Sinkhole sediments consist of 1.5 m of postsettlement alluvium or colluvium over a culturally sterile, pre-Historic sediment. The base of the postsettlement alluvium or colluvium corresponds to the base of the humus-rich horizon, Stratum III, which is interpreted as redeposited A horizon material. This redeposited, buried A horizon, which eroded off the surrounding uplands in response to accelerated erosional processes associated with European agricultural practices, is informally referred to as the 1830 paleosol (Richard Rieck, personal communication 1984). The overlying, artifact-bearing brown silt loam material represents redeposited E horizon, and this in turn is overlain by eroded B, and possibly C, horizon material. The fact that the 1830 paleosol and overlying strata have relatively abrupt upper and lower boundaries suggests that Strata I–III were deposited and buried relatively rapidly. Relatively rapid sinkhole infilling during historic times also is suggested by the preservation of primary sedimentary layering in the postsettlement alluvium or colluvium. Sedimentary structures would not be expected to be preserved in slowly accreting sediments because of the homogenizing effects of biopedologic processes. The artifacts in Strata II-III, including a pocketknife buried 1.3 m below the base of the sinkhole, therefore represent materials redeposited in the sinkhole as a result of historic agricultural practices rather than prehistoric refuse disposal. Based on this interpretation, additional excavations were not conducted in the sinkhole.

A geologic boring penetrating the sediments in the Stemler Bluff sinkhole and extending to bedrock (Erdmann and Bauer 1993) indicates that the sinkhole is at least early Pleistocene if not pre-Pleistocene in age and that it was relatively free-draining throughout most of its existence. Only one episode of sinkhole ponding is noted in the geologic boring; laminated silt and clay occur in an early Pleistocene (pre-Sangamon) soil.

Feature Analysis

A total of 218 subsurface features was identified at the Stemler Bluff site (Figure 4-3). The features are classified as structures (n=25, 11.4 percent), pits (n=136, 62.1 percent), isolated post molds (n=6, 2.7 percent) and mortuary features (n=51, 23.3 percent) (Table 4-1). Structures are either wall-trench (n=3) or single-post-and-basin (n=22) features and are commonly square to rectangular in plan. Pits are circular, oval, or elliptical in plan and are differentiated according to depth or profile shape into shallow (n=82), medium (n=10), or deep (n=12) basins, bell-shaped pits (n=29), or other (n=3); other features are unusual in their morphology and did not fit within the defined categories. Isolated post molds are not associated with any structure and possess noticeably larger diameters than structural wall posts. Mortuary features are typically rectangular or elliptical in plan and occur as a spatially distinct cluster that is separated from the residential area of the site by the sinkhole. The majority of the nonmortuary features are located along the crest of the ridge overlooking the sinkhole in the eastern half of the site (Figure 4-3). Figure 4-4 illustrates the typical morphology of the various feature types.

Several morphological and metrical attributes were determined for each feature. These attributes include profile classification, feature depth, maximum length and width as measured at the feature surface, and the length-to-width ratio. Feature orientation, with respect to magnetic north, was determined for structures and mortuary features. Floor area was calculated for those wall-trench and single-post-and-basin structures that contained remnants of the wall trench or wall posts along each of the four structure walls; maximum floor length and width measurements used in the calculations were obtained by measuring the inside distance between post molds or wall trenches on opposing walls. Pit volumes, in cubic decimeters, were calculated for the various pits and structure basins using appropriate volume formulae (Appendix A). Calculated volumes are estimations of true volume owing to variations in morphology from ideal geometric forms and to removal of the uppermost 20 cm or so of fill (plow-zone) by heavy equipment prior to feature excavation. These subsurface features were also truncated by historic agricultural activities prior to their excavation. Volumetric data were used to calculate the density, in grams per cubic decimeter, of burned clay, ceramic, and lithic material in each pit in an attempt to identify functional differences within and between pit categories.

Shallow Basins

Eighty-two features from Stemler Bluff are classified as shallow basins, defined as pits with a basin shape in profile and depths of up to 29 cm below the machine-scraped surface (Figure 4-5). Shallow basin features comprise 60.3 percent of all pit features at the Stemler Bluff site. Only one shallow basin feature, Feature 148, occurs within a structure, Feature 128, which is a single-post-and-basin structure. The feature was defined on the floor of the structure near the northeast corner and contains pottery and limestone in its fill.

The majority (n=76) of the shallow basin features are curvilinear (circular, oval, elliptical) in plan with the remaining features (22, 139, 166, 230, 232 and 267) square or rectangular in plan. Profile shape varies somewhat among the features from a typical basin with incurved sidewalls and convex base to straight or slightly outslanting sidewalls and flat or irregular bottom. The shallow basins range from 20–185 cm in length, 16–164 cm in width and

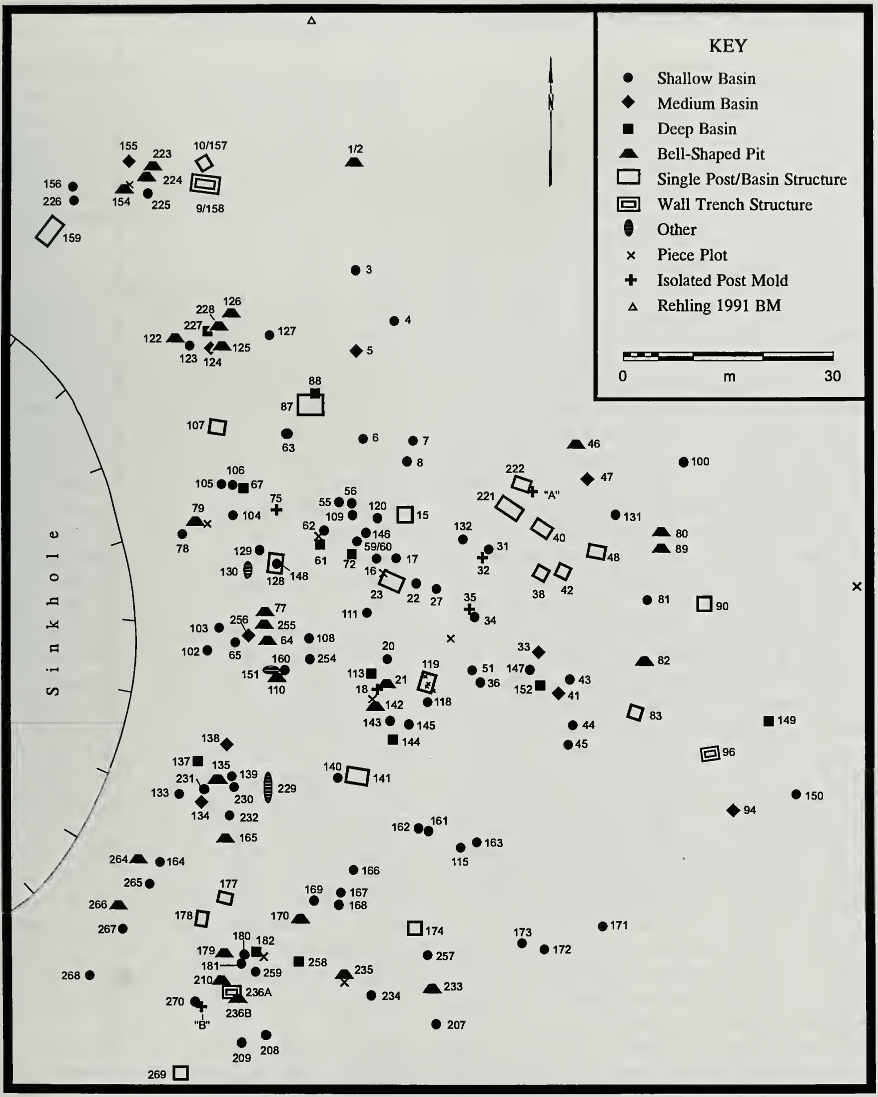

Figure 4-3. Distribution of Features in the Main Occupation Area.

Table 4-1. Feature Attributes.

Feature Type	Length min. (med.) max.	Width min. (med.) max.	Depth min. (med.) max.	Length/Width min. (med.) max.	Floor Area (m^2) min. (med.) max.
Shallow Basins (n=82)	.2 (.99) 1.85	.16 (.86) 1.64	.03 (.15) .29	1.00 (1.08) 2.70	
Medium Basins (n=10)	.59 (1.08) 2.72	.49 (.93) 1.80	.30 (.35) .38	1.00 (1.17) 1.52	
Deep Basins (n=12)	.82 (1.30) 2.26	.77 (1.12) 1.40	.40 (.53) .75	1.03 (1.11) 1.72	
Bell-Shaped Pits (n=29)	.92 (1.14) 1.79	.84 (1.00) 1.56	.30 (.51) .87	1.01 (1.09) 1.25	
Isolated Post Molds (n=6)	.13 (.20) .32	.13 (.19) .32	.07 (.19) .45	1.00 (1.02) 1.13	
Single-Post-and-Basin Structures (n=22)	1.85 (2.84) 4.40	1.64 (2.33) 4.35	.06 (.08) .22	1.01 (1.16) 1.84	3.34 (5.69) 8.45
Wall-Trench Structures (n=3)	2.49 (4.75) 4.82	2.28 (2.42) 2.45	.02 (.14) .28	1.09 (1.94) 1.99	4.04 (9.24) 10.13
Mortuary Features (n=51)	.50 (1.06)2.07	.25 (.49) .90	0.0 (.20) .77	1.12 (2.15) 4.09	
Other (n=3)	2.01 (2.16) 4.80	1.18 (1.46) 1.50	.05 (.56) 1.73	1.48 (1.70) 3.20	

Note: All measurements in meters; min.=minimum, med.=median, max.=maximum.

plan, has inslanting to straight sidewalls, a convex bottom, and is 24 cm deep (Figure 4-5). Feature 62 fill consists of an upper, relatively loose yellowish brown (10YR5/3) silt loam over a more compact brown (10YR4/3) silt loam. The lower fill zone has a mounded-like appearance that may be due to several episodes of dumping refuse or debris into the pit.

Burned fill in the shallow basin features may be associated with cooking or use as a hearth. Clumps of oxidized soil or charcoal and ash occur as concentrations within the fill of Features 31, 36, and 140 and probably represent secondary dumping of burned material. Features 22 and 27 are shallow (10 to 16 cm deep), somewhat amorphous, lens-shaped concentrations of ash, charcoal, and burned clay. Both features are interpreted as shallow, open surface hearths (Figure 4-6). Hearths at the Stemler Bluff site are defined as features with surface burning. Features 59/60, 65, and 164 also are classified as hearths (Figure 4-6). Feature 59/60 is oval in plan, basin-shaped in profile, and 10 cm deep (Figure 4-7). A shallow, circular area of burned clay and charcoal near the surface of the feature may be a remnant hearth. Feature 65 is circular in plan, basin-shaped in profile, and 16 cm deep (Figure 4-7). The hearth consists of a basin-shaped, charcoal-rich, very dark grayish brown sandy loam fill (Zone A) within yellowish brown sandy loam fill. Feature 164 is elliptical in plan, basin-shaped in profile, and 17 cm deep (Figure 4-7). The hearth consists of a brown (7.5YR4/3.5) silt loam, basin-shaped fill zone (Zone A1) mottled with strong brown and brown (7.5YR4/6 and 7.5YR4/2) burned soil inclusions or mottles that occurs within the top of brown (10YR4/3) silt loam fill (Zone A2). The feature floor deepens noticeably in the area of the hearth and may be related to the pit's function as a hearth.

Features 81, 103, 120, 230, and 265 possess burned zones at or near their base and are classified as earth ovens (Figure 4-6). Feature 81 is circular in plan, has incurving sidewalls and a flat bottom, and is 21 cm deep (Figure 4-8). The fill is characterized by a 2 to 5 cm thick, very dark grayish brown (10YR3/2) basal burned lens, the lower boundary of which is wavy. The overlying fill is a mixed strong brown (7.5YR4/6) silt loam with dark yellowish brown (10YR4/4) silty clay mottles. Feature 103 is circular in plan, has incurved sidewalls, a flat bottom, and is 18 cm deep (Figure 4-8). Feature fill consists of a thin (3 cm thick) light brownish gray (2.5Y6/2) ash layer on the floor of the pit. The ash layer probably represents burned limestone that has decomposed. Ashy gray mottles correlate with burned limestone in the overlying yellowish brown (10YR5/6) silt loam fill. Feature 120, is circular in plan, basin-shaped in profile, and 24 cm deep. This feature contained a burned layer near the floor of the pit (not visible in profile view). Most of the cultural material, including several large pieces of limestone, were collected from the burned zone. The overlying fill is dark grayish brown (10YR4/2) silty clay with brown (10YR4/3) mottles. Feature 230 is a relatively large (1.85-x-1.23 m), shallow basin that is rectangular in plan and 23 cm deep (Figure 4-8). The fill consists of thin, basal, ashy brown (10YR4/3) silt loam with charcoal concentrations. The charcoal-rich ashy layer extends up the sidewalls of the pit. The overlying fill is dark yellowish brown (10YR4/4) silt loam and contains silt and clay lenses, suggesting the pit infilled under natural processes. Feature 265 is oval in plan, basin-shaped in profile, and 16 cm deep (Figure 4-8). The feature has dark brown (10YR3/3) silt loam fill with dark brown (7.5YR3/3) burned soil, oxidized clay, and charcoal inclusions. The west and south walls of Feature 265 are partly lined with burned limestone and burned clay. Feature 207 contained large pieces of sandstone and limestone each weighing 3.2 kg and a large piece of limestone weighing 3.2 kg (Figure 4-8). Features with large amounts of burned limestone or sandstone were interpreted as earth ovens at the Sponemann site (Fortier et al. 1991). Based on content, Feature 207 is interpreted as an earth oven. It is circular in plan, basin-shaped in profile, and 10-cm deep. The fill is a homogenous dark yellowish brown (10YR4/4) silt loam.

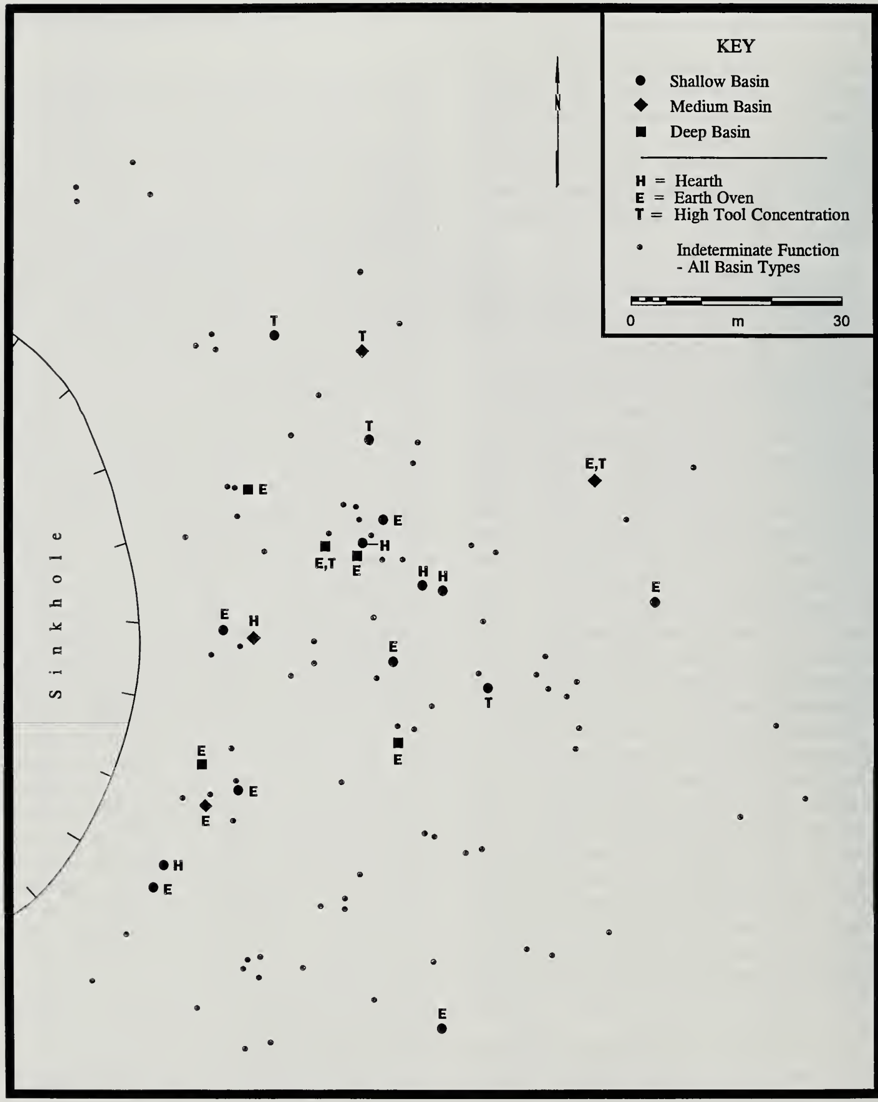

Figure 4-6. Distribution of Basin Features for Which Function Could be Determined.

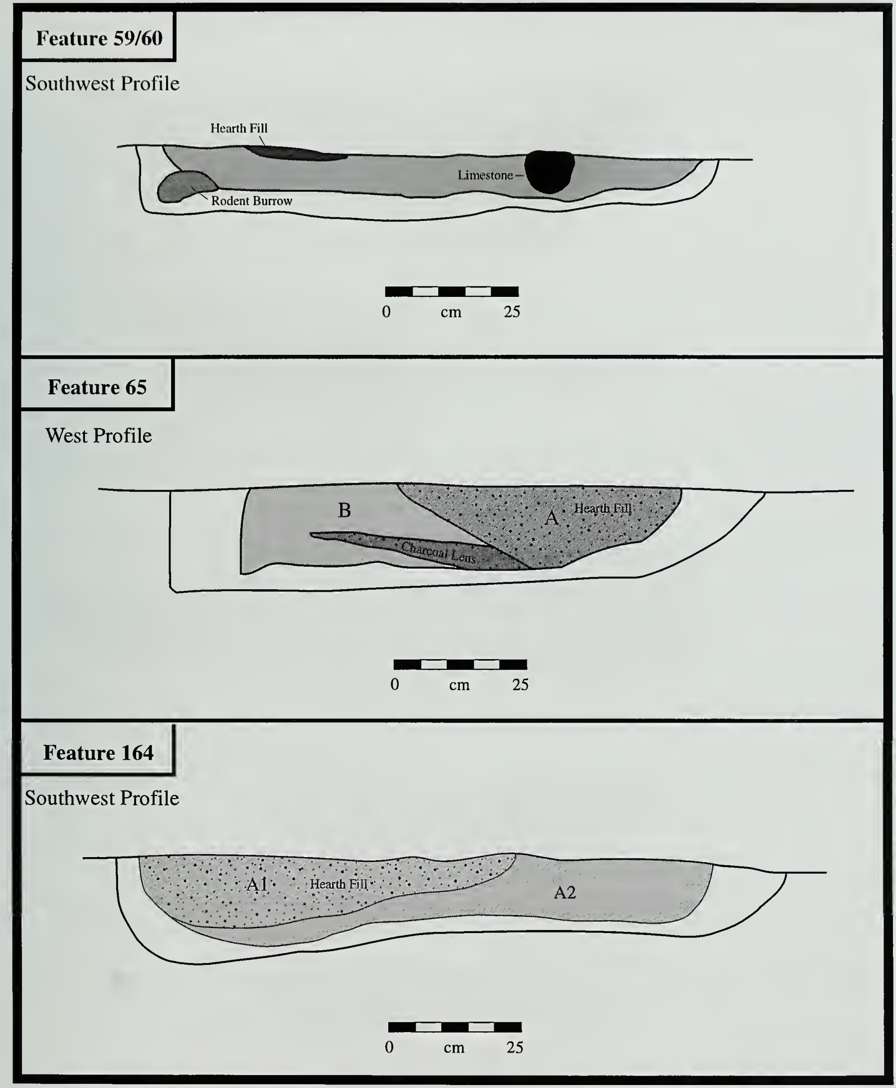

Figure 4-7. Profile Views of Shallow Basin Hearths: Features 59/60 (at top), 65 (middle), and 164 (at bottom).

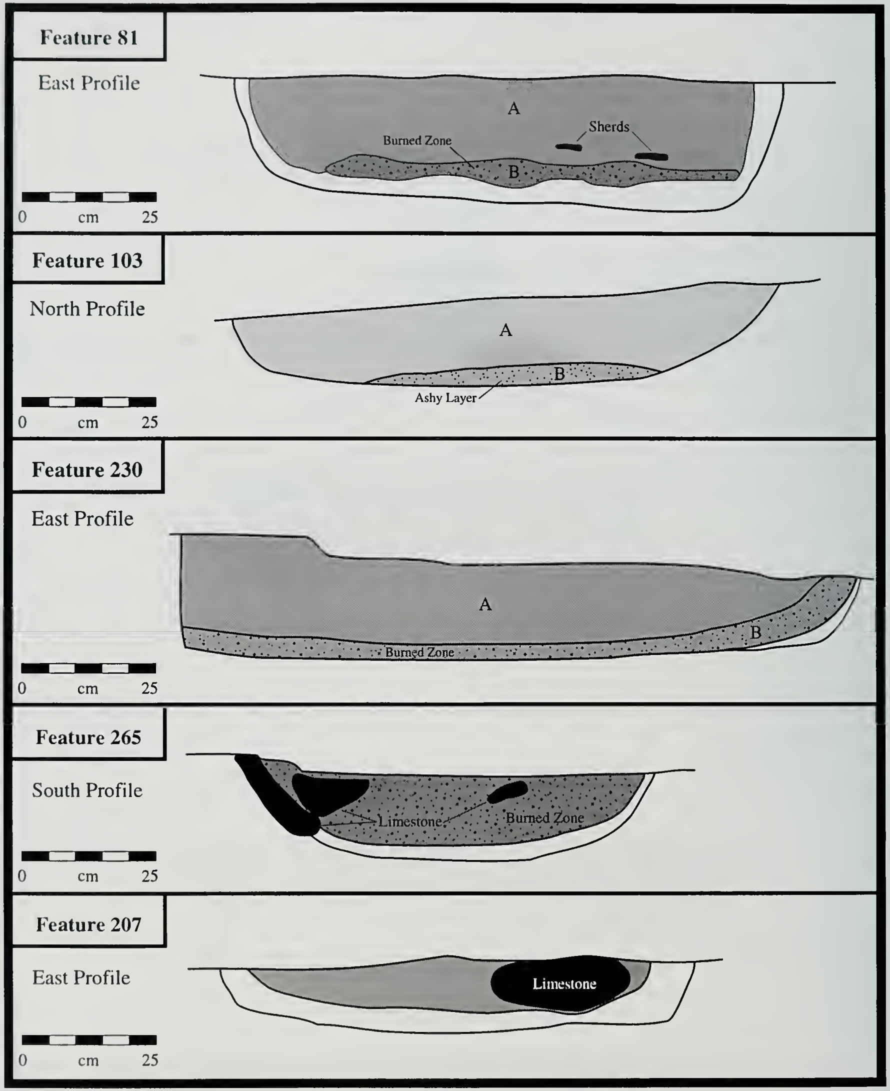

Figure 4-8. Profile Views of Shallow Basin Earth Ovens.

Four of the shallow basin features (20, 22, 36, and 120) contain relatively large amounts (275 g or more) of burned clay in their fill; the remaining shallow basins contain less than 175 g. Feature 22 (280.6 g) has been classified as a shallow hearth. Feature 36, with 317 g of burned clay, contains an ash lens in its fill that has been interpreted as a secondary deposit since it occurs as an inclusion within a single fill. Feature 120, with 362.6 g of burned clay, is an earth oven. Feature 20 contained the largest amount of burned clay by weight (888 g). Two of the burned clay nodules are unusually large, measuring more than 10-x-7 cm in size. Feature 20 also contained two large limestone slabs weighing a combined total of just over 18 kg. The only other shallow basin pit to contain as large an amount of limestone is Feature 265. In this feature, limestone slabs were found along the burned walls of the pit. Most of the other shallow basins contain less than 4.5 kg of limestone. Although the Feature 20 fill does not exhibit any evidence of burning, the presence of limestone slabs and large pieces of burned clay suggest that the pit may have functioned as an earth oven. Fortier et al. (1983) note that earth ovens at the Mund site rarely exhibited burned or oxidized sidewalls but the fill contained an abundant amount of burned clay fragments, suggesting that the pit walls had been scraped (or eroded) following use. Based on material content, Feature 20 is classified as an earth oven.

Three of the shallow basin features contain a relatively large number of chert tools or cores. Features containing 10 or more chert tools or cores may represent tool manufacturing cache pits or occur in areas devoted to tool manufacturing. Feature 6 contains one tool and 14 cores, Feature 36 contains 17 tools and 18 cores, and Feature 127 has seven tools and four cores (Figure 4-6). Three shallow basins contained at least two of the following artifacts: mano, metate, or pitted cobble. Features 109 and 160 contain mano and metate fragments and Feature 115 contains a pitted cobble and metate fragment (Figure 4-6). Two features (6 and 36) contained an unusually high amount (3.8 kg and 2.6 kg, respectively) of ceramics whereas the other shallow basins have 0 g (n=6) to 888.8 g (n=74). The features with either mano or metate fragments or large quantities of sherds may be located in areas of the site where food preparation activities were taking place.

Medium Basins

Ten features from Stemler Bluff are classified as medium basins, defined as pits that are basin-shaped in profile with depths of 30 cm to 39 cm below the machine-scraped surface (Figure 4-3). Medium basins comprise 7.4 percent of all pit features at the Stemler Bluff site. Medium basins are curvilinear in plan and are basin-shaped or have straight, slightly inslanting, or outslanting walls or flat bottoms in profile. Medium basins range from 59–272 cm in length, 49–180 cm in width, and 30–38 cm in depth (Table 4-1). Pit volumes, calculated for nine of the ten medium basins, range from 68 dm^3 to 1,415 dm^3 and average 362.5 dm^3. Density of cultural material, again calculated for nine of the ten medium basins, ranges from 18.5 g/dm^3 to 4,591 g/dm^3 and averages 1,059 g/dm^3. One of the medium basins (Feature 5) has an anomalously high, 4,591 g/dm^3, material density due to high amounts (by weight) of ceramics and chert debitage.

Feature fill ranged in color from dark grayish brown to yellowish brown, and its loose, silt loam texture was easily differentiated from the dense, clay-rich yellowish brown sterile subsoil. Five medium basins have only a single fill zone while the remaining five possess two (n=2), three (n=2), or four (n=1) fill zones. Feature 155 is a typical single-zoned medium basin that is oval in plan, has inslanting sidewalls and a flat bottom, and is 35-cm deep (Figure 4-9). It has a yellowish brown (10YR5/4) silt loam to silty clay loam fill. A typical multizoned medium basin pit is Feature 47, which is circular in plan, has inslanting sidewalls and a flat bottom, and is 37 cm deep (Figure 4-9). The fill is composed of three zones: an upper brown (10YR4/3) silt loam with a few small pale brown mottles; a middle zone

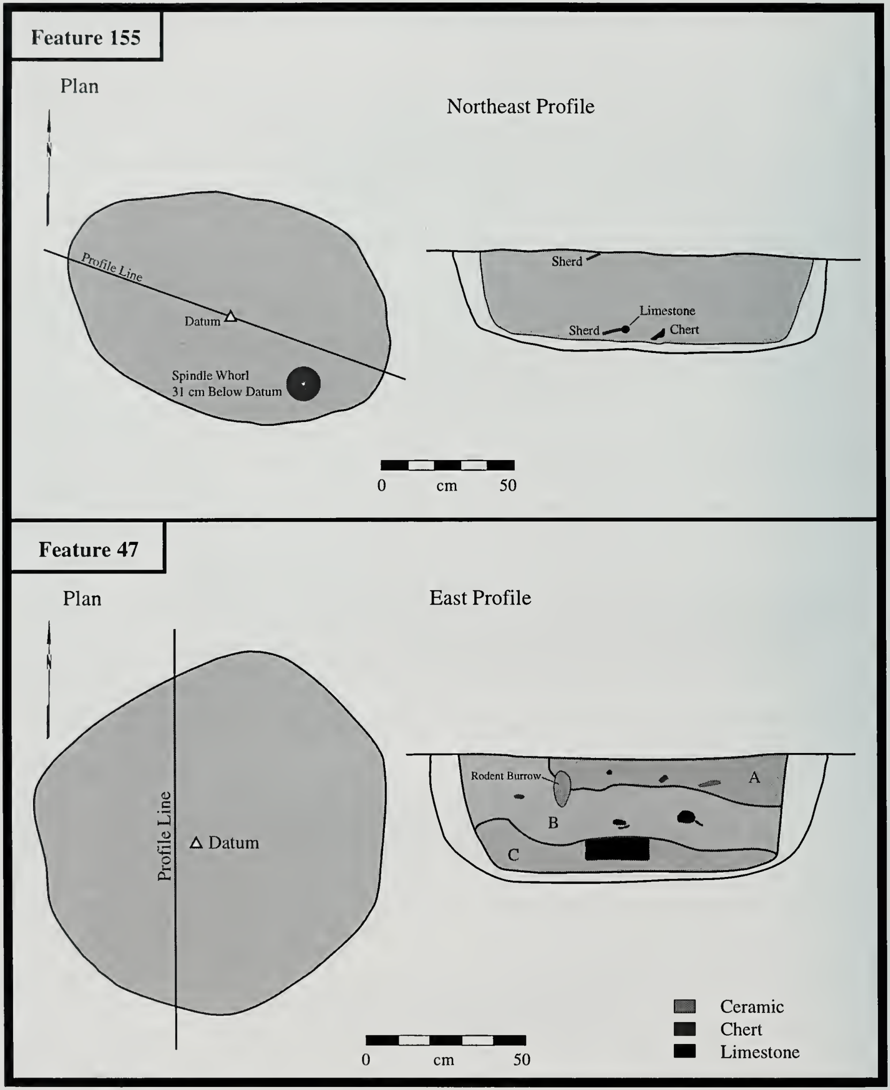

Figure 4-9. Representative Plan and Profile Views of Medium Basins: Features 155, Single Fill Zone (at top), and 47, Multiple Fill Zones (at bottom).

of yellowish brown (10YR5/4) silt loam with a few large light yellowish brown mottles; and a lower zone of brown (10YR4.5/3) silt loam with many large light yellowish brown mottles. The light yellowish brown mottles in the middle and lower zones correspond to areas of burned limestone.

Feature 138, a 32-cm-deep oval-shaped pit with straight sidewalls and flat bottom, contained evidence of in situ burning and is classified as an earth oven (Figures 4-10 and 4-6). The floor and sides of the pit were burned and oxidized. The brown (7.5YR5/4) and strong brown (7.5YR5/8) oxidized floor was covered by a thin (3 cm) ash layer that in turn was overlain by a black zone containing carbonized wood, grass, and acorn meats. The carbonized zone is buried under oxidized slump material or pale brown (10YR6/3) ashy fill. The uppermost brown (10YR5/3) silt loam fill, which contained most of the artifacts, did not appear to be associated with the lower burned zones. It appears this pit was used for refuse disposal once it ceased to function as an earth oven. Feature 47 also may have functioned as an earth oven. It contained more than 200 g of burned clay while its lower part had relatively large pieces of burned limestone (Figure 4-9). Although there is no distinct sign of in situ burning (such as oxidized soil or a black, charcoal-rich zone), the presence of large slabs of burned limestone and the burned clay nodules suggest that this pit may have been used for cooking or steaming.

Two of the medium basins (5 and 94) contain a high amount (4.5 kg and 1.4 kg) of ceramics whereas the others contain less than 900 g. Features 5 and 47 contain a relatively high number of chert tools or cores and may have been located within or adjacent to a tool manufacturing activity area (Figure 4-6). Two tools and 13 cores were recovered from Feature 5 and three tools and 15 cores were found in Feature 47, an earth oven. Feature 124, a rectangular-shaped pit in plan view, contained more than twice the amount of limestone by weight (19 kg) as the other medium basins.

Deep Basins

Twelve features from Stemler Bluff are classified as deep basins, defined as pits with basin shapes in profile and depths of 40 cm or more below the machine-scraped surface (Figure 4-3). Deep basins comprise 8.8 percent of all pit features at Stemler Bluff. The deep basins are curvilinear (n=11) or irregular (n=1) in plan. They range from 82–226 cm in length, 77–140 cm in width, and 40–75 cm in depth (Table 4-1). The deepest pits (113, 149, and 152) are elliptical in plan. Features 137 and 258 have irregularly shaped sidewalls while the other features have straight or incurved walls and flat or convex bottoms. Deep basins (n=9) range from 292 dm^3 to 909 dm^3 in volume and average 631.8 dm^3. Density of cultural material ranges from 1 g/dm^3 to 914 g/dm^3 and averages 375.9 g/dm^3. Selected characteristics of individual deep basin features are listed in Appendix A.

Color of feature fill varied from dark yellowish brown to dark brown. Feature 182 is a typical single-zone deep basin pit (Figure 4-11). It is oval in plan, has straight sidewalls and a flat bottom, and is 61-cm deep. The fill is a dark yellowish brown (10YR4/4) silt loam. Most of the deep basin features (n=8) contained multiple fill zones. Feature 149 is an example of a multizoned deep basin (Figure 4-11). It is elliptical in plan, has a basin-shaped profile, and is 75-cm deep. Three zones are identified in the fill. The uppermost fill (Zone A) is dark yellowish brown (10YR5/4) silt loam and overlies a thinner dark yellowish brown (10YR5/4) silt loam (Zone B) that contains light yellowish brown (10YR6/4) silt laminations. The lowermost fill (Zone C) is a relatively thin dark yellowish brown (10YR4/3) silty clay material. The feature contains very little cultural material (24 g/dm^3), and Zone C, which resembles a sterile fill, does not contain any material. Although the silt laminations in Zone B suggest that the pit was left open and partially infilled by natural sheetwash processes, the morphology of the fill zone is not indicative of natural accumulation. A characteristic of features that have

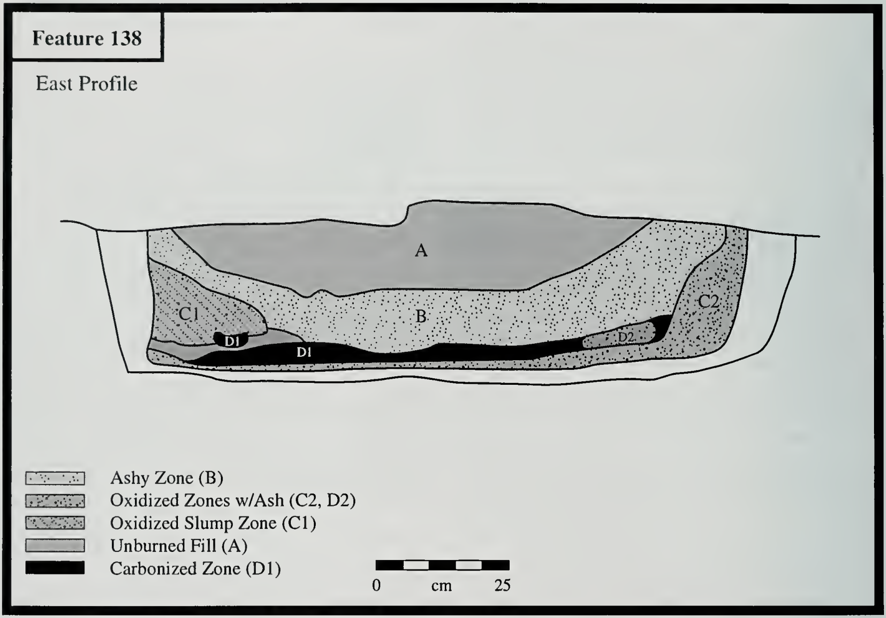

Figure 4-10. Profile View of Medium Basin Earth Ovens.

infilled naturally, according to Stahl (1985), is the draping of fill down the feature sidewalls such that the sides of the pit fill in before the center. Neither the basal, sterile fill (Zone C) nor the overlying laminated fill (Zone B) extends up the pit walls.

Five of the deep basin features (61, 67, 72, 137, and 144) are classified as earth ovens (Figure 4-6). All but one of the earth ovens (Feature 137) are circular in plan with inslanting or straight walls and flat, slightly convex, or irregular bottoms. Feature 137 is irregular in plan and profile. Feature 61 is 40-cm deep and has straight to inslanting walls and a flat bottom (Figure 4-12). The floor of the pit is covered by a thin, black lens (not seen in profile) that is buried beneath a very dark grayish brown (10YR3/2) silt loam (Zones B and C) with brown mottles and large concentrations of charcoal, some of which is carbonized grass. The amount of charred organics increases with depth to the pit floor. The burned fill is overlain by dark yellowish brown (10YR4/4) silt loam. Feature 67 is circular in plan, has inslanting walls and an irregular bottom, and is 54 cm deep (Figure 4-12). Three large limestone slabs are inclined vertically against the wall of the pit. Some burning was evident along the wall in the vicinity of the limestone slabs, and a part of the pit floor was oxidized. Reuse or partial reexcavation of Feature 67 is suggested by the shallow basin-shaped, dark yellowish brown (10YR5/4) silt loam fill superimposed onto brown (10YR5/3) fill (Figure 4-12). The base of the shallow basin fill is lined

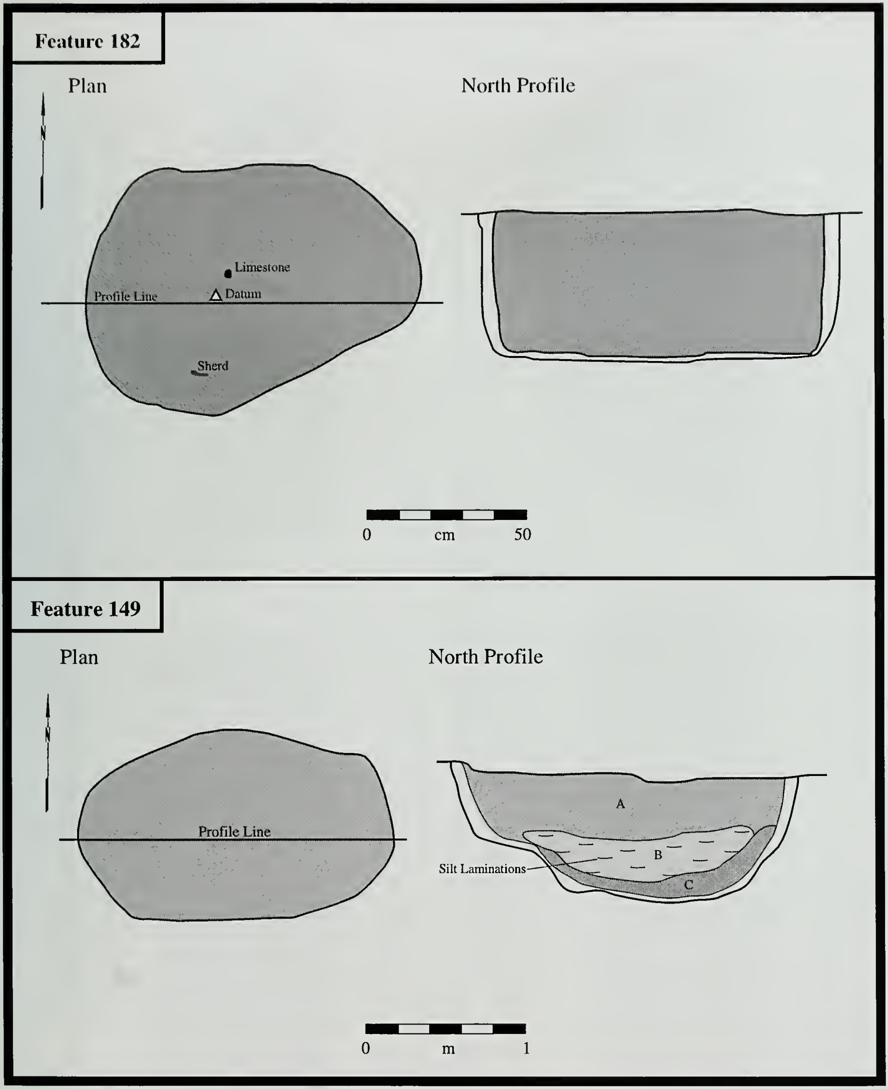

Figure 4-11. Representative Plan and Profile Views of Deep Basins: Features 182, Single Fill Zone (at top), and 149, Multiple Fill Zones (at bottom).

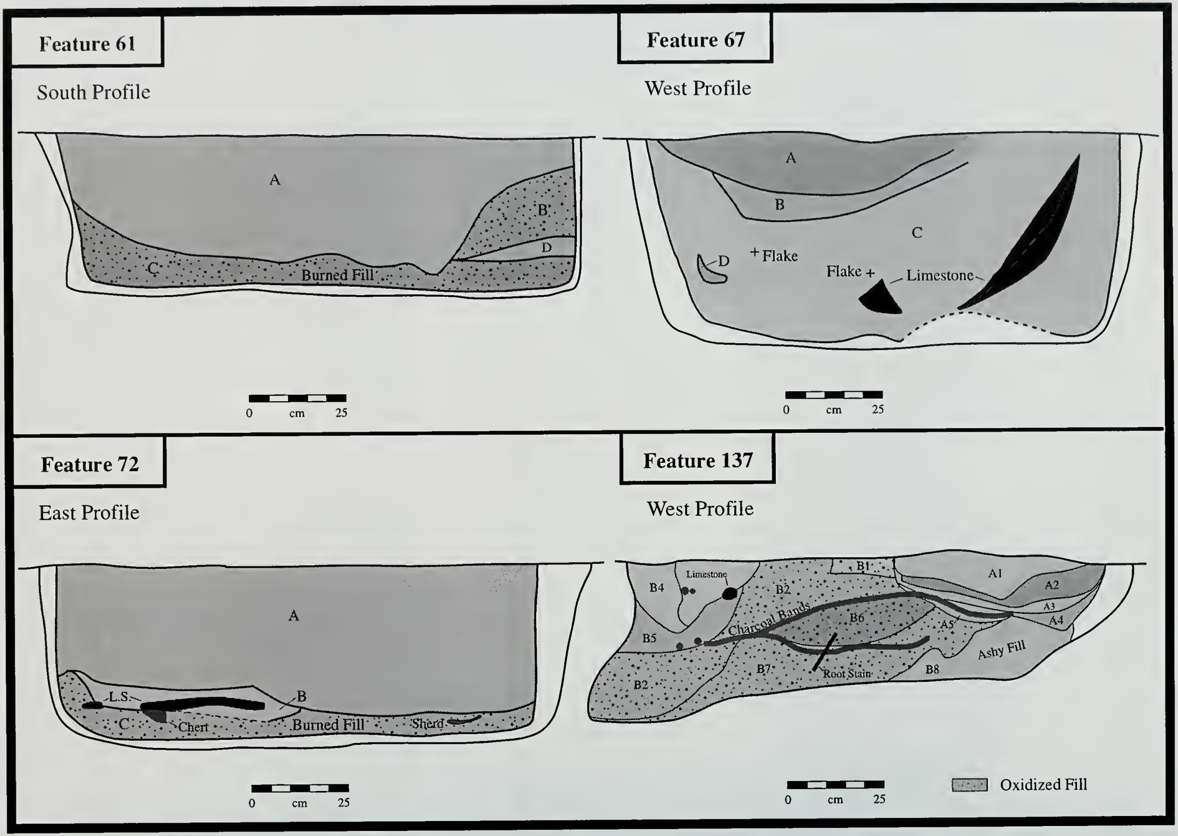

Figure 4-12. Profile Views of Deep Basin Earth Ovens.

with sterile subsoil (Zone B). Feature 72 is circular in plan, has straight sidewalls and a flat bottom, and is 46-cm deep (Figure 4-12). The basal, dark grayish brown (10YR4/2) burned Zone C and overlying grayish brown (10YR5/2) silt loam (Zone B) contain a concentration of burned limestone slabs and other cultural material. The uppermost grayish brown (10YR4/3) silt loam fill (Zone A) contains many gray to light brownish gray mottles that may represent decomposed limestone. Feature 72 initially functioned as an earth oven. The pit then was infilled relatively rapidly as evidenced by the homogenous nature of the overlying fill (Zone A) and by the low amount of cultural debris present. Feature 137 is 41-cm deep, irregular in plan and profile, and has very complex fill (Figure 4-12). The boundaries between the various fill zones are indistinct and reflect mixing. The yellowish brown (10YR5/6), brown (7.5YR5/4), and reddish brown (5YR4/4) silt loam fill is burned throughout and contains numerous burned and oxidized soil inclusions, charcoal lenses, and ash zones. Reexcavation of Feature 137 is suggested by the shallow, basin-shaped yellowish brown fill (Zone A) superimposed into oxidized fill (Zone B). Feature 144 is oval-shaped in plan, has straight to inslanting sidewalls and a convex bottom, and is 56-cm deep. The bottom of the pit contained burned limestone and burned and oxidized soil.

One of the deep basins may be a tool manufacturing cache pit or was located in the vicinity of tool manufacturing activities. Feature 61 contained six chert tools and six cores (Figure 4-6). Two deep basins may have been associated with food processing activities (Figure 4-6). Feature 67 contains a metate fragment and a mano, and Feature 72 contains a metate fragment, a mano, and a pitted cobble. These two pits also functioned as earth ovens, indicating that these artifacts were deposited following the cessation of their primary use as earth ovens.

Bell-Shaped Pits

Twenty-nine of the features at Stemler Bluff are classified as bell-shaped pits, defined as pits with outslanting or outcurved walls, basal flaring, or belled walls (Figure 4-3). Bell-shaped pits comprise 21.3 percent of all pit features at Stemler Bluff. Twenty-seven of the features are curvilinear in plan while two (126 and 264) are rectangular or square. Bell-shaped pits exhibit outslanting, belled, belled and outslanted, or belled and straight walls. Most of the features (n=23) possess flat floors whereas a few (n=6) have slightly convex or irregular bottoms. Bell-shaped pits range from 96–260 cm in length, 86–156 cm in width, and 30–87 cm in depth (Table 4-1). Volumetrically, belled pits (n=27) range from 223 dm^3 to 1,468 dm^3 and average 604.9 dm^3. Density of cultural material ranges from 125 g/dm^3 to 7,427 g/dm^3 and averages 1,580.9 g/dm^3. Only one bell-shaped pit (Feature 79) exhibits an anomalous density of material. This feature has the highest amount of ceramics (6,514 g), burned clay (877 g) and chert debitage (4,735 g) and the second highest amount of limestone (3.5 kg) of all the bell-shaped pits. Summary statistics for the bell-shaped pits are presented in Appendix A.

Color of feature fill varied from dark brown to light yellowish brown. Nearly one-half of the bell-shaped pits (n=14) contained only one or two fill zones. Feature 46 is an example of a single zone bell-shaped pit (Figure 4-13). It is oval-shaped in plan with outslanting sidewalls and a flat bottom. Feature 46 is 32-cm deep. The fill is a homogenous brown (10YR4/3) silt loam with light gray mottles. Feature 21 is an example of a multizoned bell-shaped pit (Figure 4-13). It is circular in plan with belled walls and is 65-cm deep. Six zones are identified in the feature fill. The uppermost, basin-shaped fill (Zone A) is dark brown to brown (10YR4/3) silt loam with pale brown (10YR6/3) and dark brown (7.5YR3/4) mottles and strong brown (7.5YR5/6) oxidized soil inclusions. The underlying Zone B is dark brown (7.5YR3/2) silt loam with light yellowish brown (10YR6/4) mottles. Zones C through F are noticeably lighter in color than Zones A and B. They range in color from light yellowish brown (10YR6/4) to yellowish brown (10YR5/6). Zones A and B may represent episodes of pit reuse.

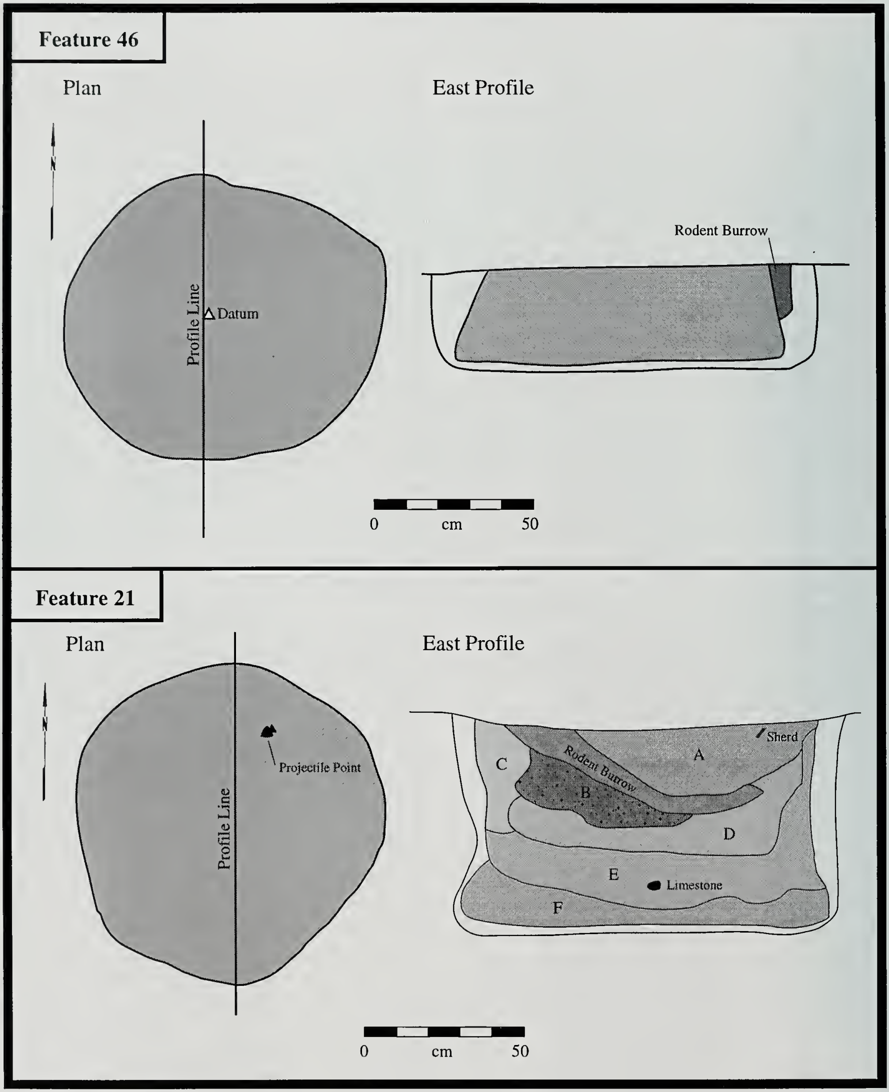

Figure 4-13. Representative Plan and Profile Views of Bell-Shaped Pits: Features 46, Single Fill Zone (at top), and 21, Multiple fill Zones (at bottom).

Bell-shaped pits containing multiple fill zones exhibit four basic patterns: irregular mounded fill, horizontally bedded fill, interfingering of zones, and draping of fill down the pit sidewalls. The irregular mounded fill pattern exhibited by Zone B in Feature ½ suggests individual episodes of dumping of dark yellowish brown (10YR4/2) silt loam (Figure 4-14). The horizontally bedded fill seen in Feature 89 may reflect sequential infilling (Figure 4-14). Interfingering of zones in Feature 80 reflects multiple discrete episodes of infilling (Figure 4-14). The presence of a slump zone along the belled edge indicates that the pit was left open for a time before it was infilled. Feature 80 also functioned as an earth oven after some infilling occurred as evidenced by the brown to dark brown (7.5YR4/4) burned fill comprising Zone B (Figure 4-14). The draping of fill down the sidewall of Feature 82 suggests the pit may have infilled by natural processes (Figure 4-14). Although all of the zones are dark yellowish brown in color, they differ in the amount of material they contain. The middle fill, which exhibits the greatest draping of sediment down the sidewalls, contains very little cultural material and is locally capped by sterile clay. Feature 82 also may have functioned as an earth oven since the floor of the pit was covered by a thin layer of charcoal (not shown in profile).

Although bell-shaped pits likely functioned as storage pits prior to other uses, nonstorage functions of some of the pits can be inferred (Figure 4-15). As discussed above, Features 80 and 82 probably functioned as earth ovens. Burned, ashy zones covering the floors of Features 77, 170, 210, 228, 233, and 266 also suggest use as earth ovens. Feature 77 is circular in plan view, has outslanting walls and a flat bottom, and is 44-cm deep. Although the fill does not show evidence of burning, concentrations of burned botanical material (possibly thatch) were found near the floor of the pit. The floor of Feature 170 is overlain by a thin charcoal layer and burnt limestone. The fill in Feature 210, which is 79-cm deep, consists of a thin, basal layer of very dark grayish brown (10YR3/2) burnt zone overlain by homogenous brown (10YR4/3) silt loam fill with light gray (10YR7/2) mottles (Figure 4-16). Feature 228 is circular in plan, has outslanting sidewalls and a flat bottom, and is 51-cm deep (Figure 4-16). A thin, basal lens of light yellowish brown (10YR6/4) ash is overlain by yellowish brown silt loam. Reuse of Feature 228 is evidenced by the occurrence of a basin-shaped fill zone in the top of the pit. The base of the intruded fill is burned and oxidized and probably represents a hearth. The hearth is bounded by slump zones that are probably related to pit reuse. The floor of Feature 233 is lined with a thin layer of burned material. The overlying fill is an homogenous yellowish brown silt loam deposit. Feature 266 is oval in plan, has outslanting walls and a flat bottom, and is 45-cm deep. It contains a prepared limestone-slab floor over a relatively thick (10–15 cm), basal layer of very pale brown (10YR7/3) ash (Figure 4-16). The limestone floor is overlain by dark brown (10YR3/3) to yellowish brown (10YR5/4) silt loam containing charcoal and burned soil inclusions. The exact function of limestone floored pits is unknown. At the Julien site, such pits are interpreted as relating to storage activities (Milner 1984a) whereas those located within the open plazas at Range are interpreted as related to communal ritual activities (Kelly et al. 1990). Burned limestone in features at the Dohack site are interpreted as hearth stones (Stahl 1985) and the burned limestone recovered at 11MO891 probably served this function as well.

Evidence for the reuse of bell-shaped pits is seen in Features 122, 126, 135, 228, and 235. These features contain a shallow, basin-shaped fill intruded into the top of the bell-shaped pit. In Feature 122, the base of the basin-shaped fill is partly lined with a subsoil-like fill (Figure 4-17). In Features 126, 135, 228, and 235, the reexcavated features functioned as hearths. The surface hearth intruded into Feature 228 was discussed above. In Feature 126, which is one of the few square to rectangular pit features at Stemler Bluff, a dark ash lens separates an upper and lower fill and probably represents the remains of a hearth or earth oven (Figure 4-17).

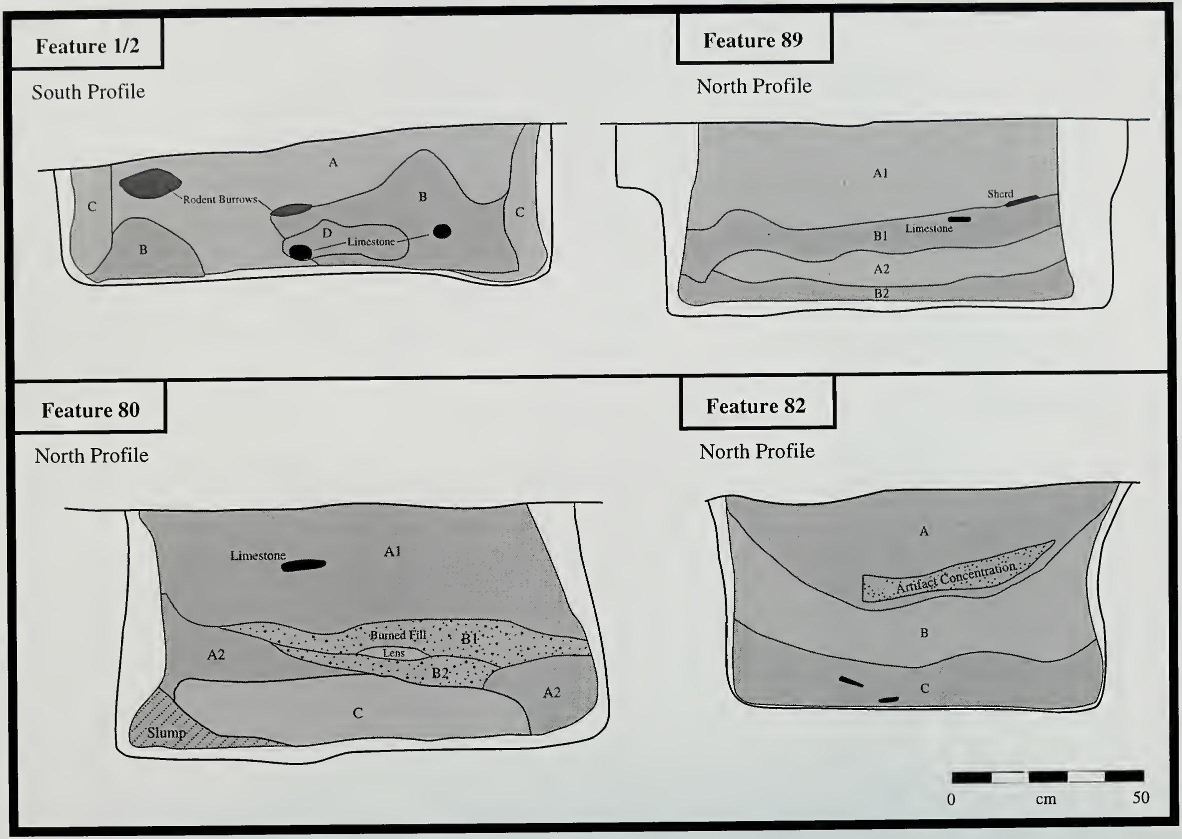

Figure 4-14. Profile Views of Different Fill Patterns in Bell-Shaped Pits with Multiple Fill Zones.

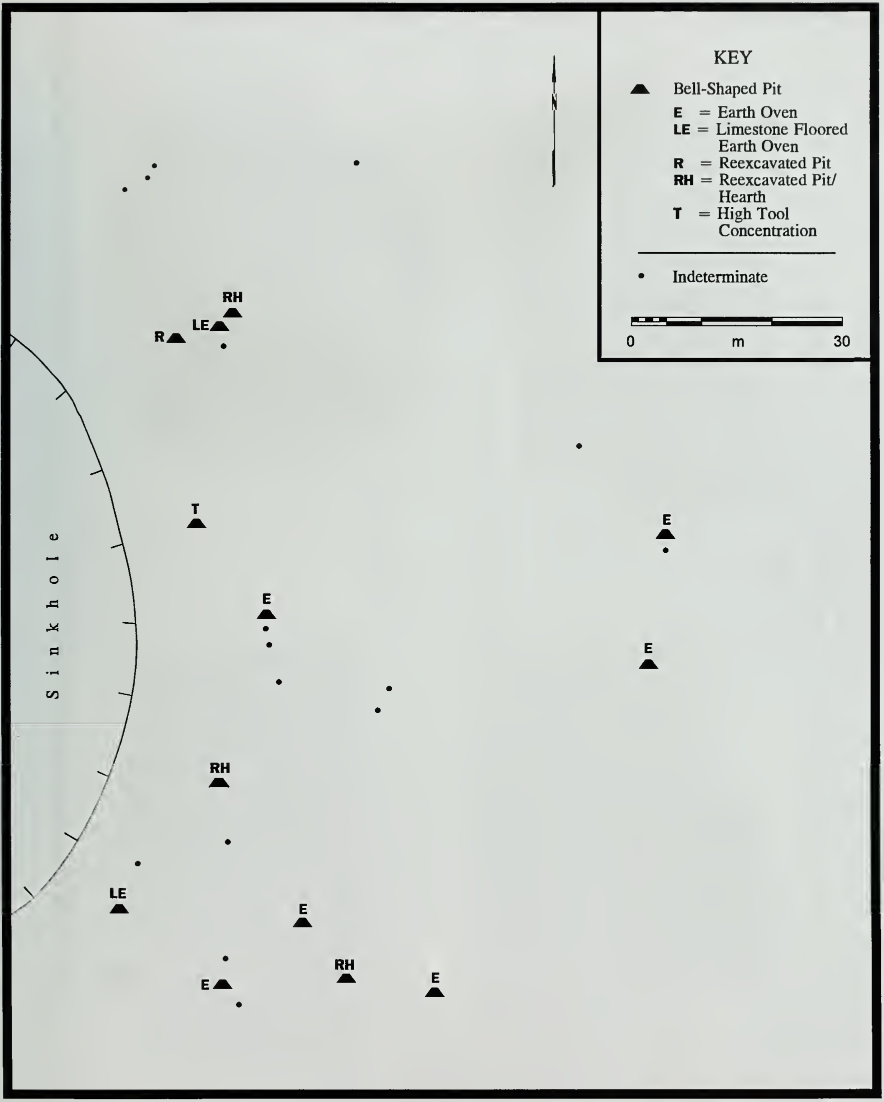

Figure 4-15. Distribution of Bell-Shaped Pits for Which Feature Function Could Be Determined.

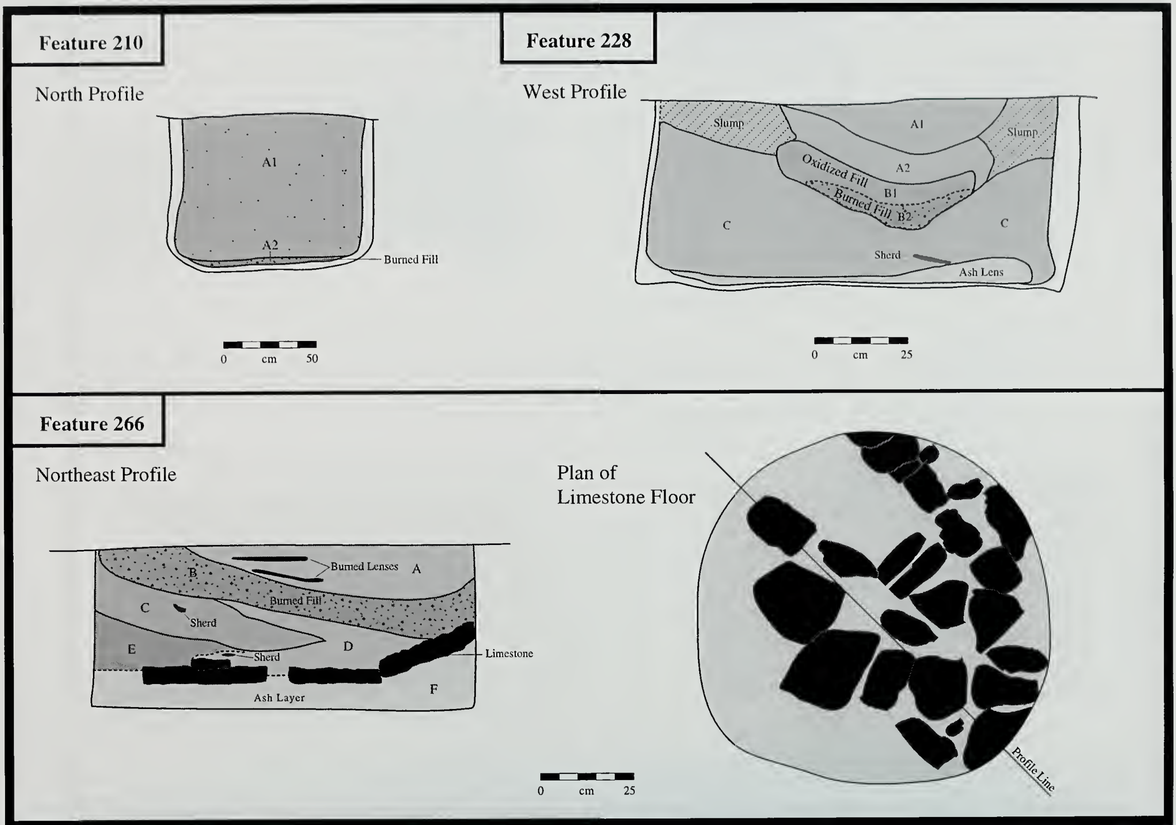

Figure 4-16. Plan and Profile Views of Bell Shaped Earth Ovens.

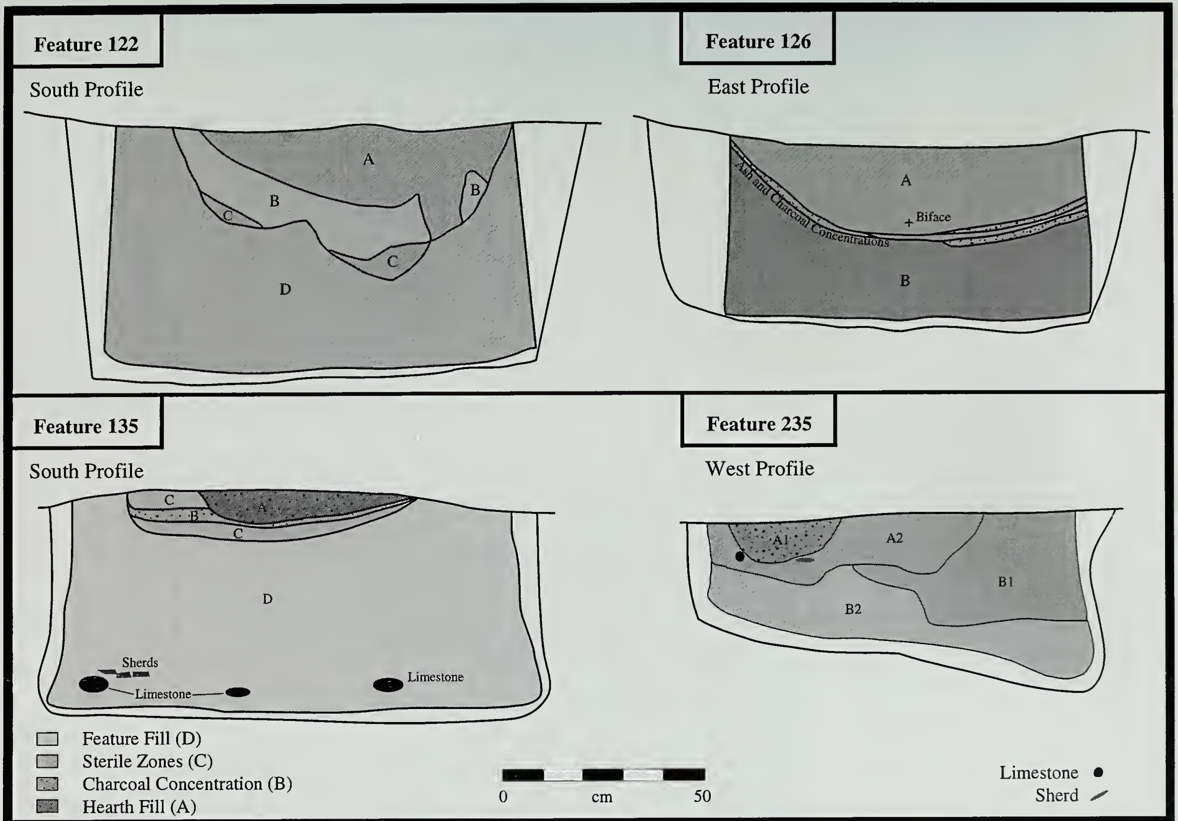

Figure 4-17. Profile Views of Reexcavated Bell-Shaped Pits. Features 126, 135, and 235 are Secondary Hearths

The surface hearth intruded into Feature 135 is a shallow (8-cm deep) basin composed of oxidized dark red (2.5YR4/6) silt loam (Figure 4-17). The base of the hearth is lined with sterile sediment. The shallow (11-cm deep) hearth intruded into Feature 235 contains relatively high amounts of charcoal and bone (Figure 4-17). The very dark gray (10YR3/1) to very dark grayish brown (10YR3/2) fill of the hearth (Zone A) contrasts markedly with the unburned dark yellowish brown (10YR4/4) and yellowish brown (10YR5/4) fill in this feature.

Seven of the bell-shaped pits contained a large number of chert tools or cores. The number of chert tools ranged from 2 to 17 and the number of cores ranged from 9 to 20. In addition to containing a large number of tools or cores, Feature 79 also contained a mano and metate fragment (Figure 4-15). Three of the belled features (79, 165, and 255) had what appeared to be prepared floors, identified as a basal zone of compacted greenish gray-colored silty clay loam material.

Isolated Post Molds

Six of the Stemler Bluff features are isolated post molds not associated with any structure (Figure 4-3). The isolated post molds are circular in plan and range from 13 to 32 cm in diameter and 7 to 45 cm in depth (Table 4-1). Selected characteristics of individual post molds are listed in Appendix A.

All six post molds are circular in plan, basin-shaped or conical in profile, and contain one fill zone that ranges in color from light yellowish brown to very dark grayish brown. Feature 32 is an example of an isolated post mold (Figure 4-18). It is conical in profile and 45-cm deep. The fill is dark yellowish brown (10YR3/4) silt loam with occasional charcoal flecks. Feature 35 was the only isolated post mold to contain cultural material (five pieces of chert debitage) in its fill.

According to Fortier et al. (1984), isolated posts commonly function as boundary markers or as wooden mills for grinding corn. Posts that function as boundary markers are typically deep and occur near structures. Features 32 (45-cm deep), 35 (11-cm deep) and "A" (not measured) form a line near a cluster of six structures and isolated Post Mold "B" (23-cm deep) is located near structure 236A (Figure 4-3).

Isolated Post Mold 18 is shallow (8-cm deep) and is located next to two bell-shaped pits (Features 21 and 142) (Figure 4-3). Bell-shaped pits are generally thought to function as in-ground storage pits and the placement of an isolated post next to two of them suggests that Feature 18 may have functioned as a wooden "corn mill." Fortier et al. (1984) indicate that wooden mills functioned as mortars and consisted of logs implanted into the ground with their upper ends hollowed out. Corn was crushed in the hollowed end. Abundant ethnohistoric evidence suggests that such wooden corn mills were used throughout much of eastern North America (Parker 1983). Further evidence that may support Feature 18 as a wooden mill is derived from Feature 142, which contains a pitted cobble and a large limestone slab on the floor of the pit, suggesting association with food-processing activities.

Single-Post-and-Basin Structures

Twenty-two of the features from Stemler Bluff are classified as single-post-and-basin structures (Figure 4-19). These structures are shallow basins with one fill zone. The fill ranges from dark yellowish brown to brown in color and is distinct from the yellowish brown silty clay loam subsoil. The structures are square, rectilinear, or irregular in plan. The majority of the rectangular structures are oriented with their long axis trending northeast-southwest or east-west (Figure 4-19). The structures vary in size from less than 2-x-2 m to more than 4-x-4 m and range from 4 to 22 cm in depth (Table 4-1). Feature 15 is the smallest single-post-and-basin structure, measuring 1.85-x-1.76 m while Feature 87 is the largest (4.4-x-4.35 m). Floor area was calculated for nine of the structures and ranged from 3.34 m^2 to

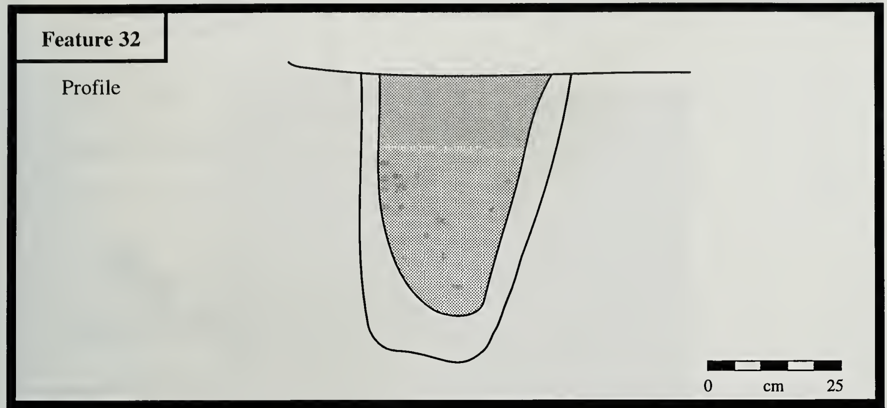

Figure 4-18. Representative Profile of an Isolated Post Mold.

8.45 m^2 (Table 4-1). Volume was calculated for twenty of the structures and ranges from 168 dm^3 to 3,254 dm^3 while density of material ranges from 19 g/dm^3 to 10,678 g/dm^3. Three of the single-post-and-basin structures have anomalously high densities of cultural material. Features 90 and 221 have high amounts, by weight, of limestone and ceramics while Feature 23 has the highest amounts of all artifact types. Selected metrical attributes of the single-post-and-basin structures are listed in Appendix A.

Post molds were not identified in eight of the structures (Figure 4-19). Feature 174 is an example of a structure lacking post molds (Figure 4-20). It is square in plan, measuring 2.6-x-2.56 m and is 17-cm deep. The fill is yellowish brown (10YR5/4) silty clay. A shallow charcoal-rich zone is present on and below the floor in the center of the structure. This burned zone is interpreted as an internal hearth. Post molds representing outer walls were identified in 12 of the single-post-and-basin structures. Feature 23 is an example of a shallow basin, single-post-and-basin structure with wall posts (Figure 4-21). It is rectangular in plan, measuring 3.38-x-2.8 m, and is 22-cm deep. Feature fill is dark grayish brown (10YR4/2) silty clay loam with a few flecks of charcoal and grayish brown mottles. Feature 23 has a floor area of 8.45 m^2, the largest of the measured single-post-and-basin structures.

Of the twelve structures with wall posts, only five (23, 42, 107, 128, and 222) have post molds completely outlining all four walls, ranging from 27 to 37 wall posts. Post-mold profiles in general show vertical orientations with the ends of most of the wall posts intentionally tapered to a point. The wall posts in each of the five structures were relatively evenly spaced, and a similar number of posts were found along each of the four walls. In Feature 23, the 35 wall posts averaged 12.5 cm in diameter, 15 cm in depth, and were spaced 32.5–37.5 cm apart as measured from the center of the post molds (Figure 4-21). Smaller diameter (7.5 to 10 cm) posts were spaced more closely (17 cm) and were clustered near the northeast, southeast, and southwest corners of the structure. Feature 42, which has a floor area of 3.34 m^2 (the smallest of the measured single-post-and-basin structures), has 27 wall posts, with five or

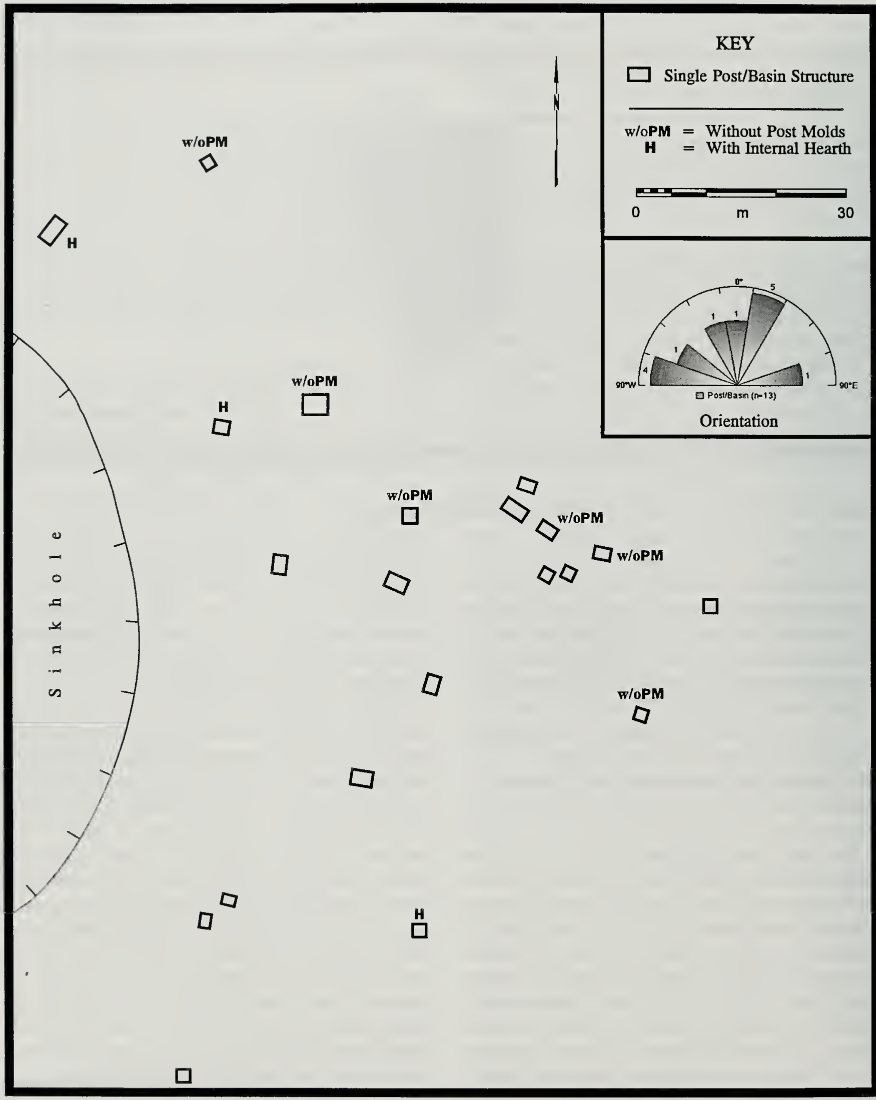

Figure 4-19. Distribution of Single-Post-and-Basin Structures.

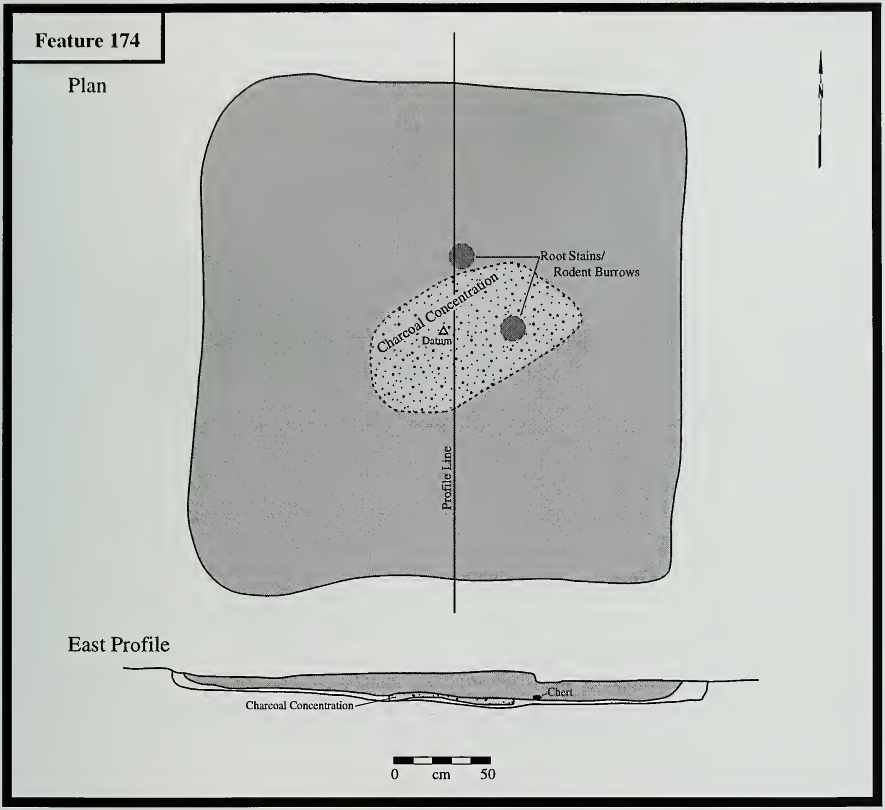

Figure 4-20. Representative Floor Plan and Basin Profile Views of a Single-Post-and-Basin Structure Without Post Molds.

six along the two short walls and seven to nine along the two long walls. Post-mold spacing varies from 10 to 12 cm along one wall to more than 20 cm along another. A cluster of three post molds, spaced 5-cm apart, is located in the north and west corners of the structure. Feature 107, with a floor area of 3.66 m^2, has 33 wall posts measuring eight to 20 cm in diameter and spaced 18-cm apart along the short east wall, 24 to 30 cm along the west wall, and 30 to 40 cm along the long north and south walls. Feature 128, which has a floor area of 5.69 m^2, has 37 wall posts measuring 6 to 12 cm in diameter and spaced 20- to 30-cm apart while the 34 wall posts in Feature 222 measure 10 to 16 cm in diameter and are

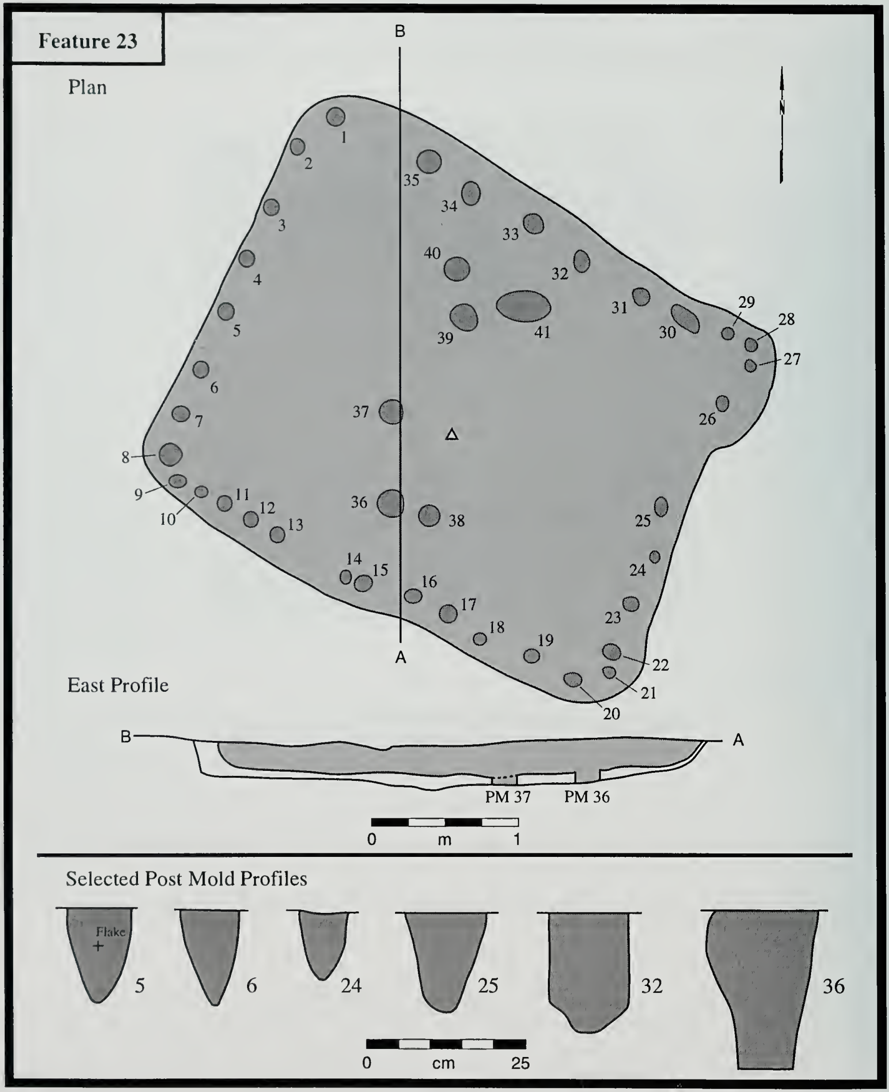

Figure 4-21. Representative Floor Plan and Profile Views of a Single-Post-and-Basin Structure with Wall Posts and Interior Posts.

spaced 24- to 36-cm apart. Feature 222 has a floor area of 6.85 m^2. Noticeable gaps in wall-post spacing were observed in three of the structures (23, 42, and 222). Gaps between wall posts are generally interpreted as entrances (McElrath et al. 1987; Kelly et al. 1990). Feature 23 has a 75-cm gap near the northwest corner, a 70-cm gap along the short east wall, and a 42.5-cm gap along the long south wall (Figure 4-21). Feature 42 contains two gaps (40-cm and 50-cm wide) separated by one post mold along the northeast wall while Feature 222 contains 50-cm gaps in the southeast corner and midway along the long north wall.

Internal posts (n=19) were identified in seven of the structures. Features 159 (with floor area of 7.81 m^2), 178 (with floor area of 4.23 m^2), 222 (with floor area of 6.85 m^2), and 269 (with floor area of 6.60 m^2) each contain one internal post. Feature 107 contains three internal posts, two of which have noticeably larger diameters than the wall posts. All three of the internal posts occur in the east half of the structure within 20 cm of the wall posts and may be bench support posts. Feature 23 has six internal posts, three of which are clustered midway along the long north wall, and the other three are along the south wall (Figure 4-21). These internal posts bisect the structure and may have functioned as a partition. Feature 128 has six internal posts, with the three smallest forming a line parallel to the long east wall. These may have functioned as a partition or as bench supports. A larger diameter post is located near the southeast corner of the house, and a similar-sized floor pit (Feature 148) containing limestone and ceramics is present in the northeast corner of Feature 128.

Only one post-and-basin structure (Feature 42) appeared to have in situ floor material. This material consisted of three large limestone slabs. The largest slab was located along the entrance to the structure (where gaps in wall post spacing occur). Shallow burned areas are found on the floor of Features 159 and 174. In Feature 159, the charcoal-rich, dark grayish brown burned zone is located in the southeast part of the structure, and in Feature 174 it is centrally located (Figure 4-20). These burned areas are interpreted as internal hearths. Ten of the single-post-and-basin structures contain a large number of chert tools or cores. The number of chert tools per structure ranges from one to 16 and the number of cores ranges from 13 to 41.

Wall-Trench Structures

Three of the features from Stemler Bluff are classified as wall-trench structures (Figure 4-3). Wall-trench structures are typically interpreted as Mississippian in age. Features 9/158 and 236A are relatively large (4.82-x-2.42 m and 4.75-x-2.45 m, respectively) rectangular, basin-shaped structures that are oriented northwest-southeast and northeast-southwest, respectively. Feature 96 is a small (2.49-x-2.28 m), square-shaped structure that is 16 cm in depth. The structure basins are 2- to 28-cm deep and contain only one fill zone that ranges in color from dark yellowish brown to dark grayish brown. Summary statistics are presented in Table 4-1 and selected characteristics of individual structures are listed in Appendix A.

The fill in Feature 9/158 contained a large amount of ash, burned soil, and burned wood (Figure 4-22). Remnants of burned wall and roof timbers were found lying on the house floor along all four walls. Fallen timbers along the east wall were oriented east-west, and those on the floor along the north, south, and west walls were oriented north-south; remnants of burned grass (matting or thatch) covered the timbers along the east wall. The floor in the east part of the structure was burned and oxidized, suggesting that the fire was most intense in this part of the house. Also on the floor of Feature 9/158 was a central hearth that was slightly irregular in plan and measured 60-x-60 cm in diameter and 5 cm in depth (Figure 4-23). On the floor in the southwest part of the house was a concentration of burned nutshell, pottery sherds, and a large limestone slab suggesting this part of the structure was used during food processing.

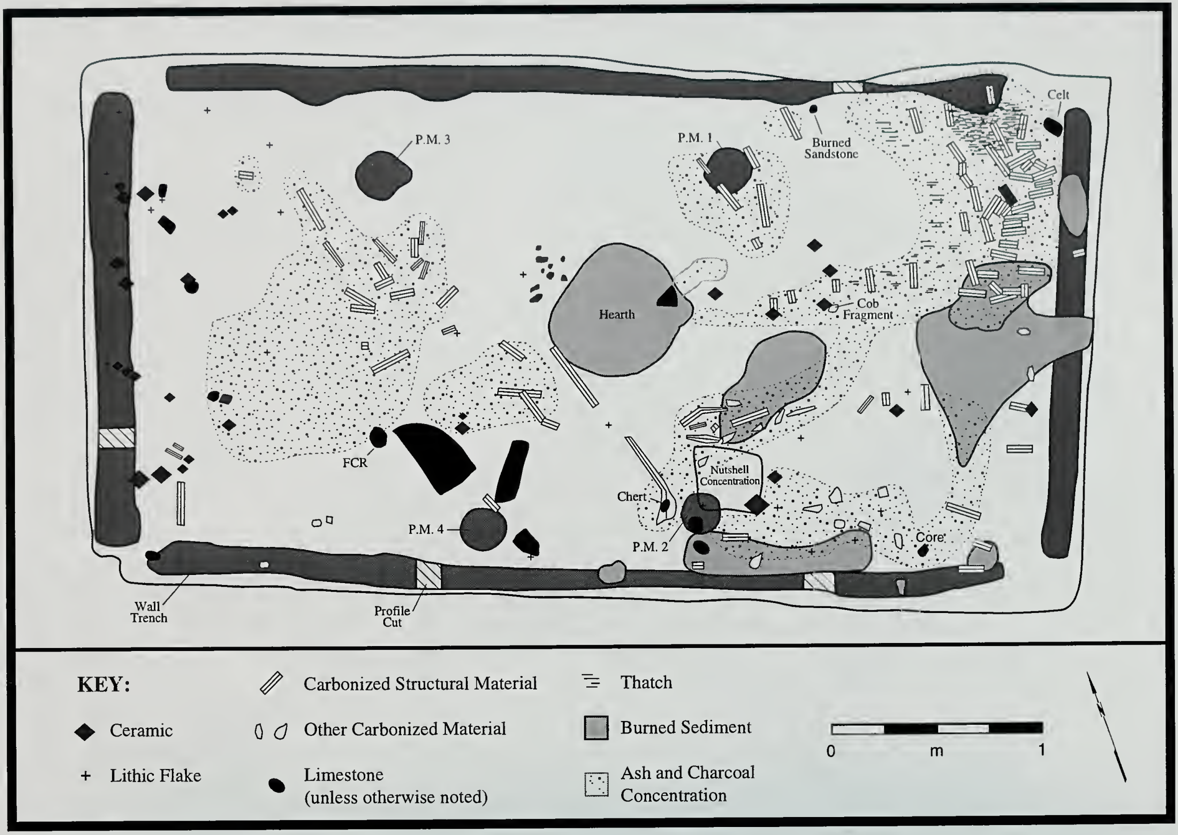

Figure 4-22. Floor Plan View of Wall-Trench Structure 9/158.

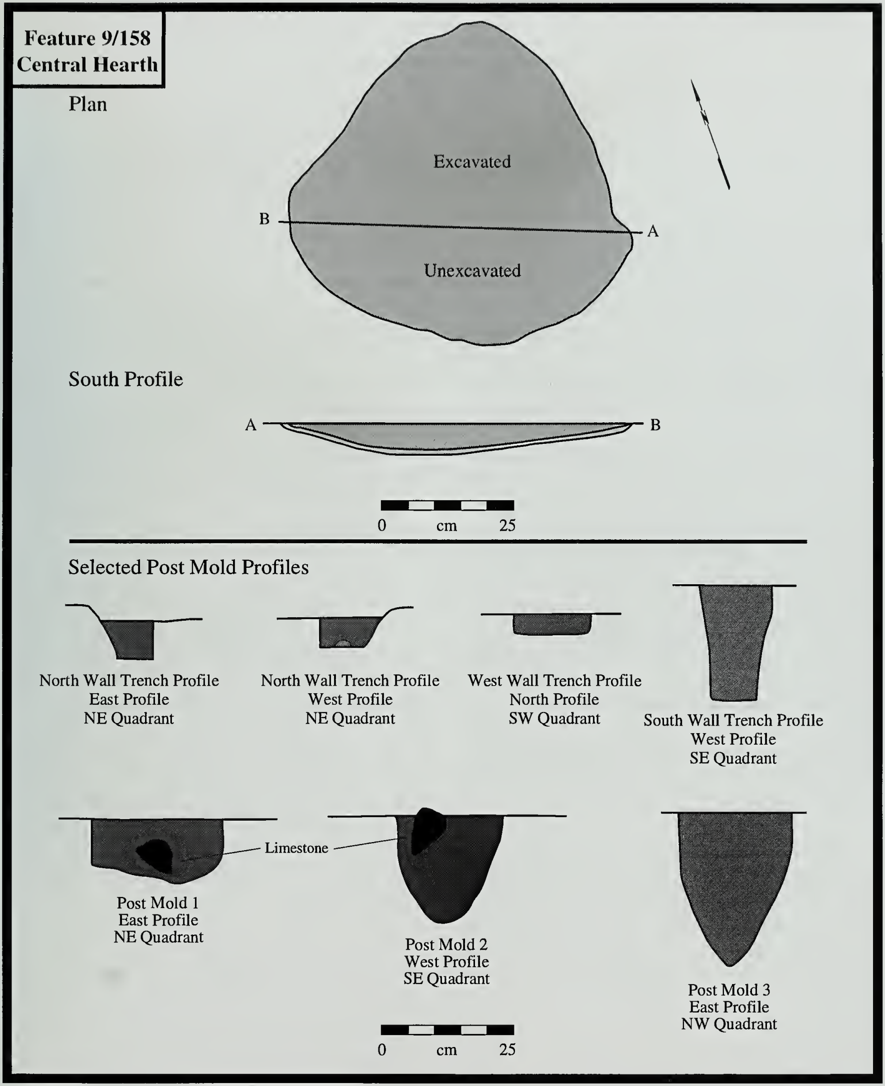

Figure 4-23. Plan and Profile Views of the Central Hearth and Selected Post Molds in Wall-Trench Structure 9/158.

Remnants of wall trenches were located on the floor along all four walls in Feature 9/158, which has a floor area of 9.24 m^2 (Figure 4-22). The wall trenches measured 10–14-cm wide along the north and south walls, 12-cm wide along the east wall, and 16- to 20-cm wide along the west wall. The trenches ranged from 4- to 22-cm deep. The structure has four isolated interior post molds measuring 20 to 24 cm in diameter and 12 to 30 cm in depth along the north and south walls (Figure 4-23). Two post molds on the south wall were located within 20 cm of the wall trench. The other two post molds located on the north wall are situated almost directly opposite the two posts along the south wall. These interior posts probably functioned as roof or bench supports.

Feature 236A has the largest interior floor area (10.13 m^2) of all the structures at Stemler Bluff. Wall trenches, which average 12.5 cm in width, were found along all four walls. The north wall trench does not parallel the north edge of the structure basin but trends at a 15° angle from the northeast corner. Four post molds are associated with Feature 236A. Two are exterior posts that lie outside the wall trench near the structure's southwest corner. Another post, located near the structure's northeast corner, superimposes the east wall trench and Feature 236B, a bell-shaped pit, itself superimposed by Structure 236A. The fourth internal post bisects the east wall trench approximately midway along its length.

Feature 96 has the smallest floor area (4.04 m^2) of the wall-trench structures at Stemler Bluff. Wall trenches were only partially preserved along the west and north walls. Ten post molds, however, are preserved at the base of the wall trenches and along the south wall. The post molds measure 8 to 20 cm in diameter and vary in depth from 3 to 17 cm. All of the posts are conical in profile. A large (78-cm diameter) circular depression measuring 4- to 12-cm deep is located in the center of the structure. Several large sherds overlying a limestone slab were associated with the depression which may represent an internal hearth feature.

Mortuary Features

Fifty-one of the features at Stemler Bluff are classified as mortuary features. These features form a spatially discrete cluster located northwest of the sinkhole (Figure 4-24). Feature shape in plan is commonly rectangular, oval, or elliptical. The orientation of the long axes of the features ranges between N68W and N90E with the majority oriented between 0 to 90E (Figure 4-24). Feature profiles show incurved, inslanting or straight sidewalls, and flat, convex, or irregular bottoms. Mortuary features range from 50 to 207 cm in length, 25 to 90 cm in width, and up to 77 cm in depth (Table 4-1). Twenty of the mortuary features contained human remains. Feature 195 contained remains of three individuals whereas the other 19 features with human remains contained only a single individual. Selected characteristics of individual features are listed in Appendix A.

Mortuary feature fill was commonly light yellowish brown (10YR6/4) silt loam with many light brownish gray (10YR6/2) silt loam mottles. The fill possessed a platy-like structure wherein the light gray mottling occurred along the plate boundaries mimicking sedimentary layering. Because of the high amount of light gray mottling, the feature fill often was described as having an "ashy" appearance. Feature 192 is an example of a mortuary feature with light yellowish silt loam fill (Figure 4-25). It is elliptical in plan view with the long axis oriented N35°E, and it measures 125-x-51 cm in size and 14 cm in depth. The fill contained remnants of human teeth.

Very few of the mortuary pits (n=8) show evidence of grave preparation. Limestone slabs are present in five of the features. Feature 188 is a stone box grave with limestone slabs lining its walls and floor (Figure 4-26). Remnants of a limestone cover or roof were present in Features 195, 198, and 249. Limestone slabs were found at opposite ends of the grave in Feature 243, which also had charred wood on the floor along the two side walls (Figure 4-26).

Figure 4-24. Distribution of Mortuary Features at the Stemler Bluff Site.

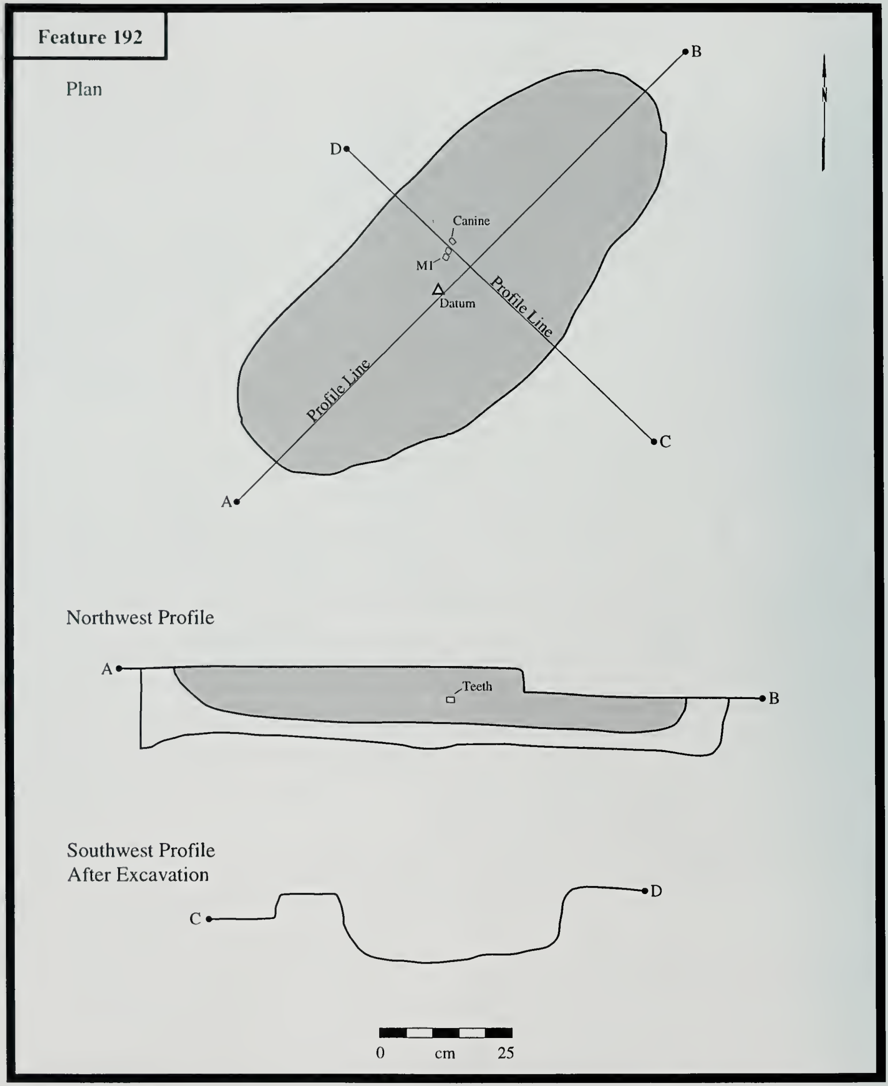

Figure 4-25. Representative Plan and Profile Views of a Mortuary Feature.

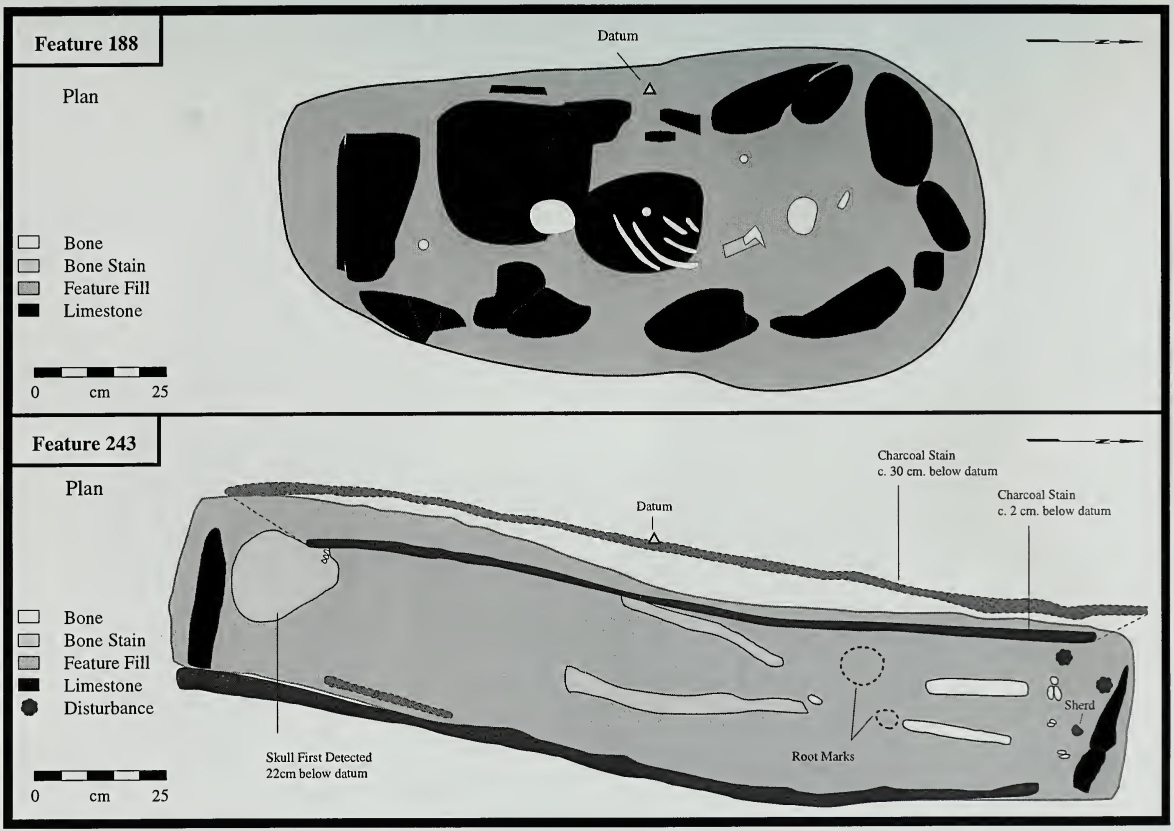

Figure 4-26. Floor Plan Views of Mortuary Features Showing Limestone Slabs and Charcoal (Wood) Stains: Features 188 and 243.

Three other mortuary features contained burned wood or concentrations of charcoal. Feature 203 contained linear charcoal stains along the side walls indicating burnt wood on the floor (Figure 4-27). Charred wood in Feature 217 occurred along the side walls and at the ends of the grave (Figure 4-27). Feature 219 contained small charcoal concentrations at both the head and foot of the grave. Large ceramic body sherds overlie remnants of a skull in Feature 253. A complete discussion and analysis of the human burials and mortuary features is presented in Chapter 8.

Other

Three of the features at Stemler Bluff are classified as "other" (Figure 4-3). Summary statistics are presented in Table 4-1 and selected characteristics of each are listed in Appendix A. Feature 229 is a long (4.8 m), narrow (1.5 m) ellipse in plan view with an unusually high length-to-width ratio (3.2) and a deep (56 cm) basin profile (Figure 4-28). Only one-half of the feature was excavated before it was destroyed by heavy equipment. Four distinct zones exhibiting complex fill patterns were identified. Generally, the fills were described as "ashy" and ranged in color from light brownish gray (10YR6/2) to brown (10YR4/3). The fill contained a large amount of cultural material, including chert tools and cores.

Feature 151 is superimposed by Feature 110, a bell-shaped pit, and Feature 160, a shallow basin pit. It is elliptical in plan and measures 201-x-118 cm in size and 173 cm in depth. The feature is irregular in profile with incurving and straight sidewalls and a sloping bottom (Figure 4-28). The base of the pit is flared along its eastern edge, and the floor slopes noticeably down toward the flared edge. Four distinct zones were present in the fill; the upper three zones exhibit a basin-shaped pattern. The lowermost fill is brown to dark brown (10YR4/3) silt loam with light brownish gray (10YR6/2) and dark grayish brown (10YR4/2) silt streaks and mottles. This zone is overlain by yellowish brown (10YR5/4) light silty clay loam that resembles the sterile subsoil. It may be a cap intentionally deposited to cover a more humus-rich basal fill. Yellowish brown (10YR5/4) silt loam fill overlying the subsoil cap contains very pale brown (10YR7/3) silt laminae throughout, suggesting that this zone filled in naturally. The uppermost fill is very dark grayish brown (10YR4/2) silt loam material. Very little cultural material was recovered from feature fill.

Feature 130 is a large (2.16-x-1.46 m), shallow (4 cm), charcoal stain. It is elliptical in plan with incurving sidewalls and a flat bottom. Feature fill is yellowish brown (10YR5/4) silt loam with black and reddish brown (5YR4/4) burned soil inclusions. It may represent a large open surface hearth.

Summary of Feature Investigations

Feature fill at the Stemler Bluff site generally was differentiated easily from the surrounding subsoil by its darker color, lower clay content, and the presence of charcoal and artifact concentrations. Nearly all of the nonmortuary features contained some amount of burned clay or charcoal scattered throughout the fill. The fill in the mortuary pits, on the other hand, was more pale yellow in color and contained less charcoal, burned clay, and artifacts than nonmortuary features. Because the soil in the mortuary and habitation areas is the same, an Alford silt loam (Higgins 1987), the difference in fill characteristics are attributable to differences in feature content and function. Most of the structures (91.3 percent), shallow basin pits (90.2 percent), and mortuary features (96.1 percent) contained only one fill zone. Features containing one homogenous fill zone in which siltation features (laminations) are not present were probably infilled relatively rapidly, perhaps intentionally. Also, the general absence of observable slump zones in the majority of features at Stemler Bluff, which Emerson and Jackson (1984) suggest can form after only one or two severe rain storms, suggests that the pits were not left open for any extended period of time. However, silt

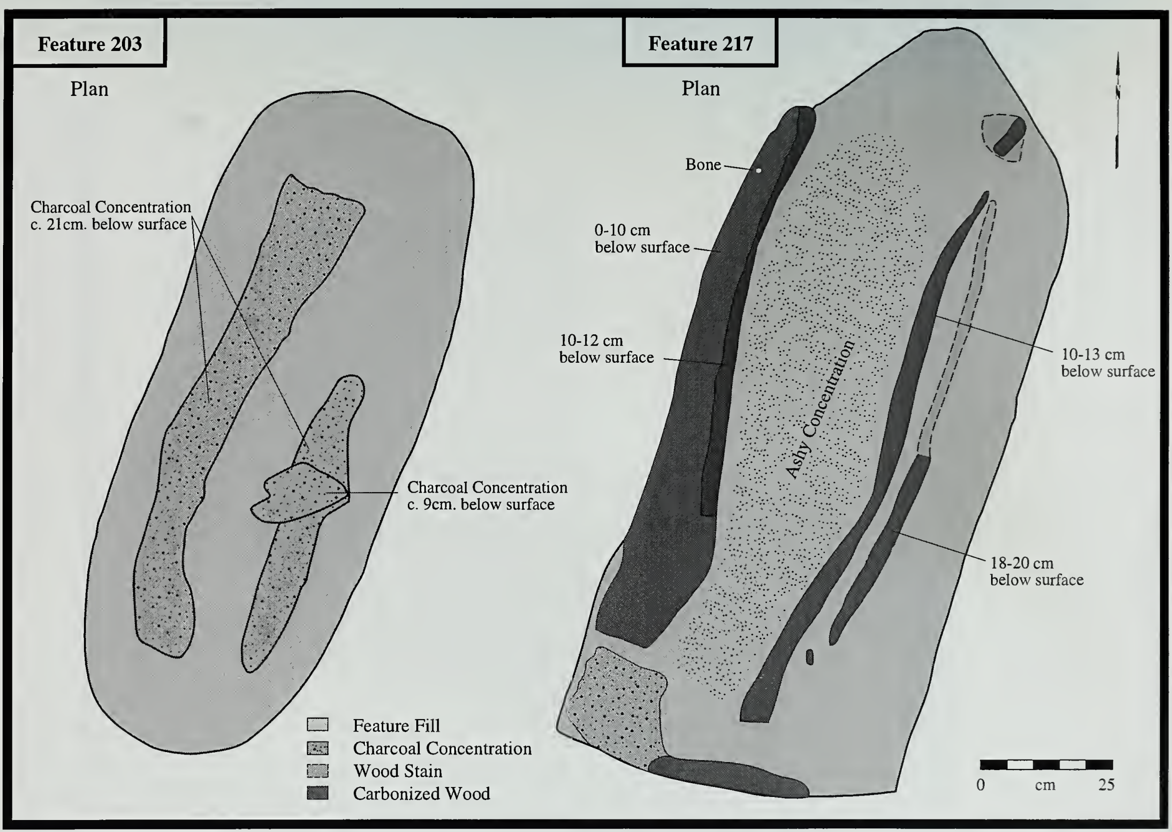

Figure 4-27. Plan Views of Mortuary Features Showing Wood Charcoal Concentrations: Features 203 (at left) and 217 (at right).

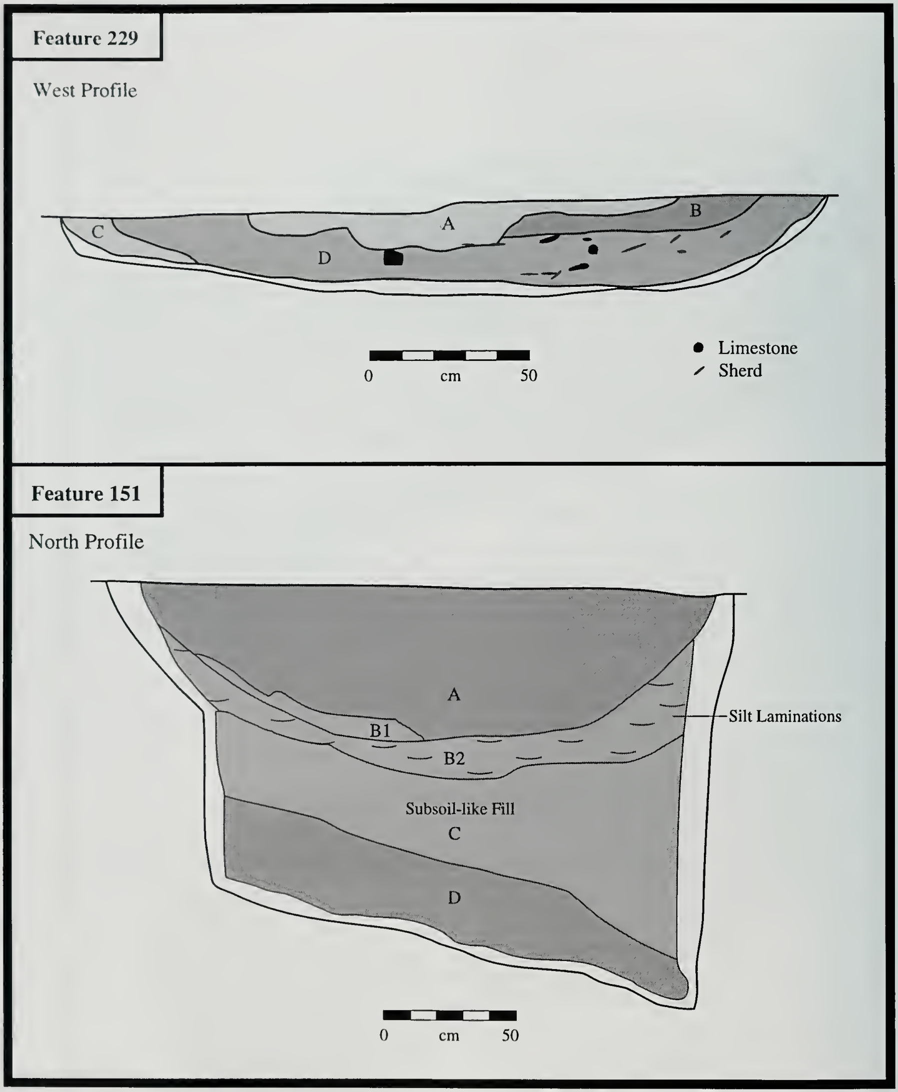

Figure 4-28. Profile Views of "Other" Type Features.

laminations in the fill of Features 149, 151, and 230 and slump zones in Features 34, 80, 128, and 223 suggest these pits were temporarily left open and were partially infilled by natural sheet erosion and slumping processes. Features with multiple fill zones may represent more than one filling or use event. However, as Emerson and Jackson (1984) note, not all fill zones represent distinct periods of pit use as sherds from a single vessel have been found in different fill zones in some features at the BBB Motor Site. Similar patterns of sherds from a single vessel being found in different fill zones within a feature also occur at Stemler Bluff. This suggests that the abandoned pits were infilled relatively rapidly and purposefully.

Partial reexcavation or reuse of previously infilled features at Stemler Bluff is suggested for those features containing basin-shaped fill superimposed into the top of the rest of the feature fill (Figure 4-29). This, together with superpositioning of features (Figure 4-29), suggests there was reoccupation or reuse of a previously abandoned site area. Superpositioning of features at the site is observed in eight instances involving a total of 17 features. In three of these cases, isolated Post Molds A, B, and 35 are superimposed on features 222 (single-post-and-basin structure), 270 (shallow basin), and 34 (shallow basin), respectively. Feature 31, a shallow basin, is superimposed on Feature 32, an isolated post mold, and another shallow basin, Feature 160, is superimposed on Feature 151 (classified as "other"), and by Feature 110, a bell-shaped pit. Feature 88, a deep basin, is superimposed by a single-post-and-basin structure, Feature 87, the only instance of superpositioning involving a deep basin. Feature 125, a bell-shaped pit, is superpositioned on Feature 124, a medium basin, while another bell-shaped pit, Feature 236B, is superpositioned by Feature 236A, a wall-trench structure.

Other evidence to suggest site reoccupation or reuse through time is derived from pit morphology in plan view. The majority of pits at Stemler Bluff are curvilinear (circular, oval, elliptical) in plan. Six shallow basins and two bell-shaped pits are square or rectangular (Figure 4-29). In the American Bottom region, pit shape in plan is temporally significant (Emerson and Jackson 1984). Square or rectangular pits are associated with early Emergent Mississippian period whereas curvilinear pits are later Emergent Mississippian. The rectangular and square-shaped features at Stemler Bluff are clustered in the southern part of the site near a Patrick phase Late Woodland structure (Feature 269).

Several types of feature function, based on artifact content, artifact density, fill characteristics, or morphology, are inferred at the Stemler Bluff site. Wall-trench and single-post-and-basin structures are assumed to have functioned mainly as living and sleeping quarters and may or may not show evidence of other activity. Mortuary features functioned as receptacles for the processing and internment of the dead. All bell-shaped pits are assumed to have functioned initially as storage pits prior to other uses. Pits with burned fill may have been used for cooking activities and are classified as hearths or earth ovens. Hearths at Stemler Bluff are differentiated from earth ovens by the location of the burned zone within the pit. Surface burning suggests a hearth while basal burning suggests an earth oven. The hearths are either shallow, somewhat amorphous concentrations of charcoal and burned clay or distinct basin-shaped burned zones at or near the surface of the feature. Features classified as earth ovens possess a burned (reduced or oxidized) zone or ash zone at or near the pit floor. Fortier et al. (1991) classified features at the Sponemann site as earth ovens if they contained one or more burned zones at or near the pit bottom or if they contained a relatively large amount of burned limestone, sandstone, or burned clay. Earth ovens at Range are typically associated with bell-shaped pits or those exhibiting outslanting walls (Kelly et al. 1990). The general absence of oxidized walls and floors in those Stemler Bluff site features classified as hearths or earth ovens is not unusual for such features in the American Bottom region (e.g., Stahl 1985; Fortier et al. 1991). Twenty-two earth ovens

Figure 4-29. Distribution of Reexcavated, Superimposed, and Rectilinear Pits.

were identified at the Stemler Bluff site. Seven (31.8 percent) of the earth ovens are shallow basins, two (9.1 percent) are medium basins, five (22.7 percent) are deep basins, and eight (36.4 percent) are bell-shaped pits.

Pits interpreted as occurring near food processing areas included those containing at least two different artifacts (mano, metate, pitted cobble) thought to be associated with seed, nut, or grain processing. Features that contain a relatively high number of chert tools or cores are interpreted as tool-processing caches or occur near areas devoted to lithic tool manufacture. Of the 24 features containing more than 10 chert tools and cores combined, 13 of them also contain sandstone abraders and hammerstones. Of the 20 features at the site that contain abraders, only seven do not contain a high number of chert tools or cores.

Radiocarbon Dates

Thirteen samples were selected for radiocarbon assay from the 218 features excavated at the Stemler Bluff site (Figure 4-30). Those chosen for dating represent a range of feature types including storage or processing pits, single-post-and-basin and wall-trench structures, and mortuary features. The features selected for radiocarbon assay were chosen on the basis of the following criteria: presence of diagnostic artifacts within feature fill, adequate quantities of charred organic material to assure accurate age determinations by standard radiocarbon assay methods, and typological and spatial representativeness of the features present at the site. The 13 features selected (Features 6, 9/158, 23, 33, 36, 79, 80, 82, 159, 203, 217, 221, and 222) each met at least one of the above criteria.

All of the samples submitted for radiometric dating consisted of carbonized material that was hand collected during feature excavation. This charred material was immediately placed into aluminum foil following its removal from feature context and was subjected to minimal handling by the excavators. All collected samples then were visually inspected in the laboratory to assess the amount and type of carbonized material present. In this way, many of the collected samples were eliminated from consideration for radiometric dating based on the small quantities of charred material present. In general, the charred materials were found to be poorly preserved due to the acidic nature of the loess soil matrix at the Stemler Bluff site. Preservation of charcoal was further compromised in many instances by the secondary nature of the deposition of charred materials. Relatively few features have evidence of in situ burning, indicating that charcoal samples represent redeposited material. The 13 samples selected were comprised largely of charred wood fragments, mainly oak (*Quercus* spp.), with additional ring-porous hardwood taxa present. This wood charcoal was highly fragmentary and often sparsely distributed in feature fill. Nutshell was not a major component in most of the excavated features and is present only in small amounts within several of the dated samples. The conventional radiocarbon dates, calibrated ages, and calibrated calendrical ages obtained from Stemler Bluff are presented in Table 4-2, and Figure 4-31. The conventional age determinations represent the measured years before present (1950) and include a one standard deviation error factor. Estimates of $^{12}C/^{13}C$ fractionation ratios were made for each sample based on typical values for wood and nutshell in North America by the dating laboratory. The two calibrated age estimates, calibrated age B.P. and calibrated calendrical age, are based on dendrochronological calibrations of North American samples (Vogel et al. 1993).

Radiocarbon Sample Descriptions and Contexts

Six feature types are represented within the samples selected for radiometric assay. Two of the samples are from shallow basin features (Features 6 and 36). This is the most commonly occurring fea-

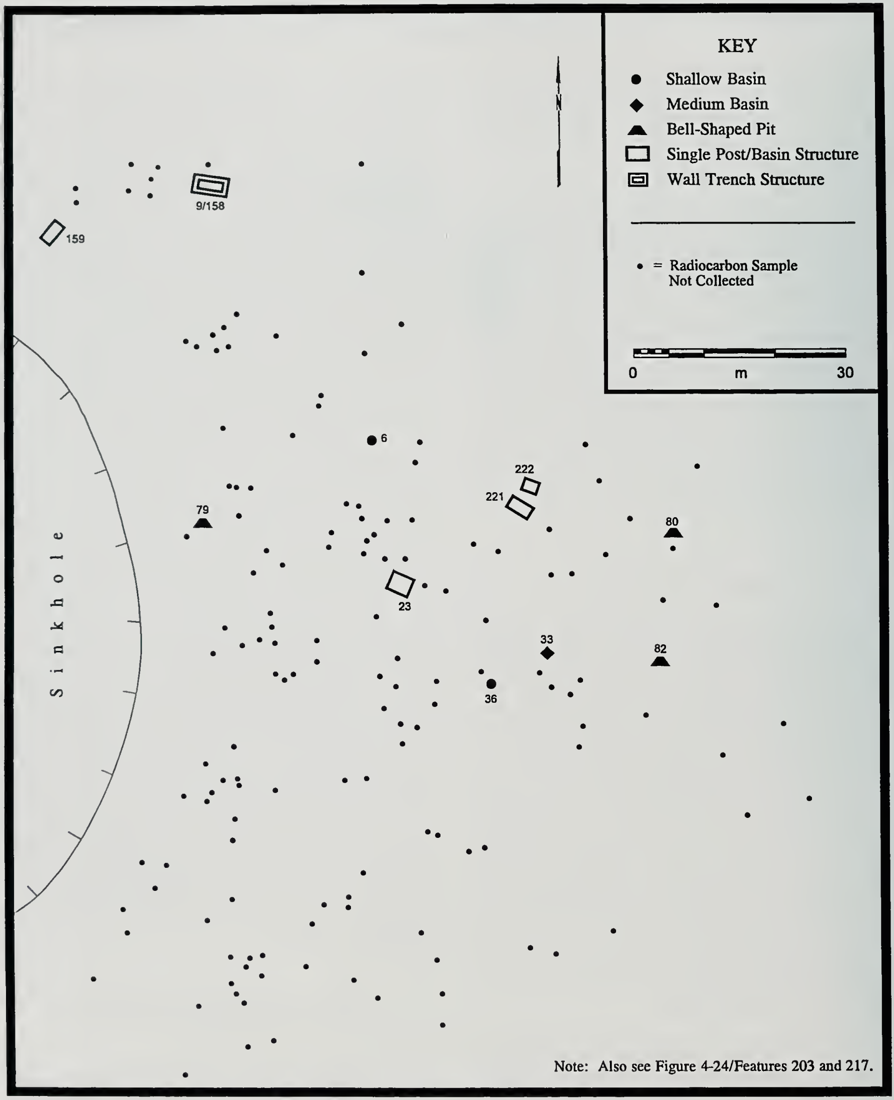

Figure 4-30. Locations of Features from Which Radiocarbon Samples Were Collected.

Table 4-2. Stemler Bluff Site Radiocarbon Dates.

Sample ID	Feature	Conventional ^{14}C Age (B.P.)	Calibrated Age Range[a]	Calendrical Age Intercept[b]
Beta-86790	6	990±60	A.D. 970–1195	A.D. 1025
Beta-86791	9/158	1010±60	A.D. 905–920 and A.D. 950–1175	A.D. 1020
Beta-86792	23	1110±50	A.D. 855–1020	A.D. 970
Beta-86793	33	840±50	A.D. 1045–1105 and A.D. 1115–1280	A.D. 1220
Beta-86794	36	910±60	A.D. 1010–1260	A.D. 1165
Beta-86795	79	840±60	A.D. 1035–1285	A.D. 1220
Beta-86796	80	870±80	A.D. 1010–1290	A.D. 1195
Beta-86797	82	950±50	A.D. 1000–1215	A.D. 1040
Beta-86798	159	930±60	A.D. 1000–1245	A.D. 1055, A.D. 1090, A.D. 1150
Beta-86799	203	970±60	A.D. 980–1215	A.D. 1035
Beta-79830	217	930±60	A.D. 1000–1245	A.D. 1055, A.D. 1090, A.D. 1150
Beta-86800	221	940±70	A.D. 985–1250	A.D. 1045, A.D. 1105, A.D. 1115
Beta-86801	222	760±70	A.D. 1170–1315 and A.D. 1345–1390	A.D. 1275

[a]2 sigma, 95% probability.
[b]intercept of radiocarbon age with calibration curve.
References: Vogel et al. 1993; Talma and Vogel 1993; Stuiver et al. 1993.

ture type at the Stemler Bluff site. A single sample originated from a medium basin, Feature 33. Medium basins are morphologically similar to the more numerous shallow basins but exhibit greater depths. Three samples originated from bell-shaped pits (Features 79, 80, and 82) that likely functioned as storage facilities prior to their final infilling with residential debris. Four samples were collected from within single-post-and-basin structures (Features 23, 159, 221, and 222), and one sample was collected from one of three wall trench structures present at the site (Feature 9/158). The final two samples were collected from the mortuary area of the site (Features 203 and 217). Table 4-2 summarizes the radiometric age determinations along with two methods of calibrating the resultant conventional radiocarbon dates.

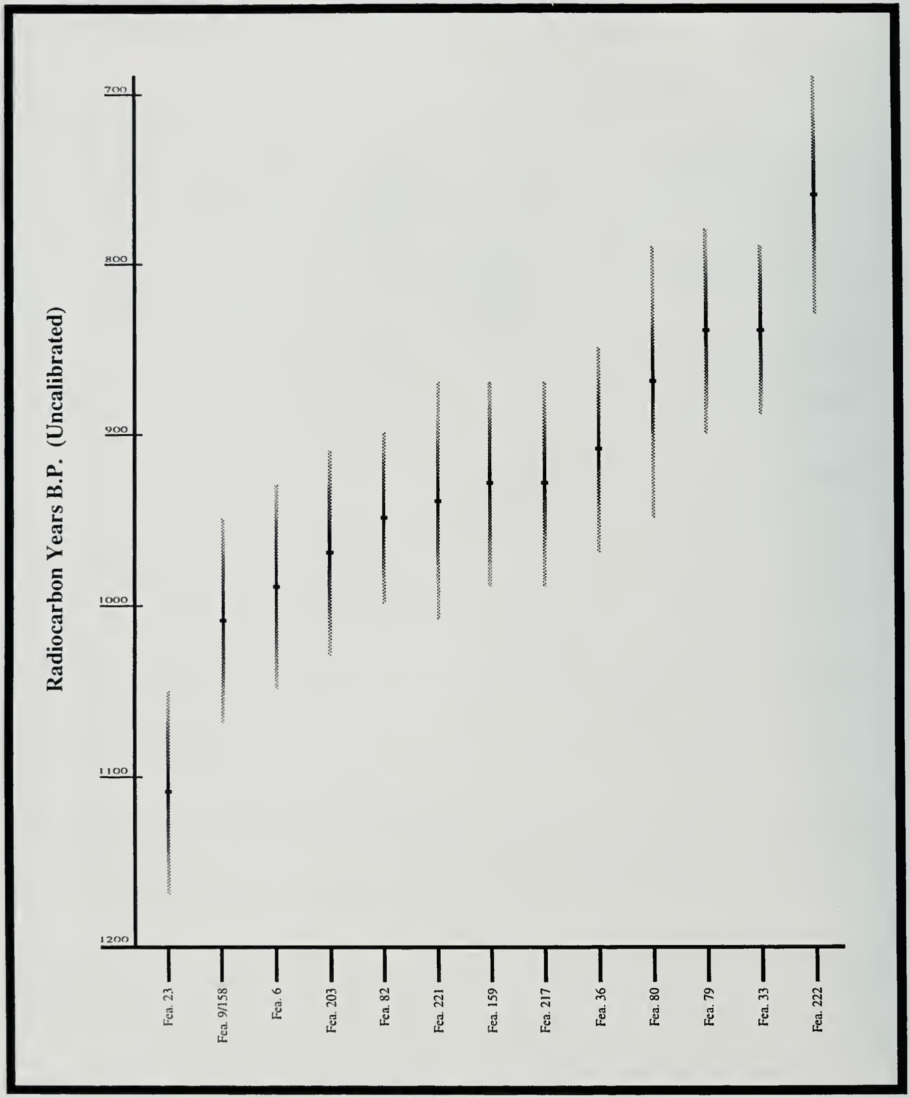

Figure 4-31. Radiocarbon Dates from the Stemler Bluff Site.

Shallow Basins

Two radiocarbon dates were obtained from shallow basin pits. Feature 6 measures approximately 1.48 m-x-1.30 m in plan view. When profiled, Feature 6 was found to extend to a maximum depth of 24 cm below the machine-stripped surface. A single fill zone was identified that contained charcoal, faunal material, lithic debitage, ceramics, and limestone fragments. An 8.0 g sample of hand-collected charcoal consisting of oak and ring-porous hardwood produced a conventional radiocarbon date of 990±60 B.P. (Beta-86790).

The second shallow basin to be dated, Feature 36, is a straight-sided, trash-filled pit measuring 1.46-x-1.32 m with a maximum depth of 27 cm below the machine-stripped surface. In profile, this pit was found to consist of a single fill zone containing charcoal, limestone-tempered ceramics, several flake points, fire-cracked rock, limestone, and some faunal material. A distinct ashy lens was present in the northeast portion of the feature. A carbon sample consisting of 7.3 g of ring-porous hardwood was submitted for dating and yielded a conventional date of 910±60 B.P. (Beta-86794).

Medium Basins

Feature 33 is a basin-shaped pit about 1.0-x-.94 m in diameter, with a maximum depth of 30 cm. In profile, this pit was found to have straight to sloping walls and a flat bottom. Three internal fill zones were identified including a zone with moderate charcoal and burnt sediments. Also noted within that zone was a quantity of faunal material. The basal zone of the pit contained a lesser amount of charcoal but no bone, suggesting sequential fill events are represented within this feature. A combined sample of 19.4 g of wood charcoal, including ring-porous hardwood and oak, was collected from the three fill zones in this pit for radiometric assay. A conventional date of 840±50 B.P. (Beta-86793) was obtained from this feature.

Bell-Shaped Pits

Three radiocarbon dates were obtained from bell-shaped pits. Feature 79 is approximately 1.2 m in diameter, with a maximum depth of 87 cm below the stripped surface. Five internal fill zones were defined in profile that contained a large amount of ceramic sherds, lithic debris, and limestone fragments. Charcoal was apparent as mottles throughout each of the zones. The uppermost zone is about 30-cm thick and appears to have been deposited in a single episode. The next zone, however, was deposited during several distinct episodes of dumping, and contained the majority of debris recovered from this pit. The three lower zones, while still flecked with charcoal and containing sherds, produced significantly fewer artifacts. A sample of wood charcoal totaling 18.6 g was collected from the pit and submitted for dating. This sample produced a conventional date of 840±60 B.P. (Beta-86795).

Feature 80, approximately 1 m in diameter and 62 cm deep, is similar to Feature 79 in profile, with multiple zones apparent. The upper zone contained a large limestone hoe and a mano/anvil in addition to sherds, limestone fragments, faunal material, and charcoal. Charcoal was taken from three zones in the north half of the pit for dating. The sample, consisting of 9.6 g of oak and ring-porous hardwood and resulted in a date of 870±80 B.P. (Beta-86796).

The final bell-shaped pit to be dated, Feature 82, appeared as an oval stain approximately 1.14-x-.99 m in plan view at the machine-stripped surface. In profile, this feature was found to extend to a maximum depth of 63 cm below the stripped surface and to consist of three distinct fill zones. The uppermost and basal zones, each containing a variety of materials, were separated by a nearly sterile silty zone. The basal zone produced an abundance of charcoal and ashy fill along with ceramics, limestone fragments, and lithic debris. Twenty grams of wood charcoal collected from the north half of this feature produced a conventional date of 950±50 B.P. (Beta-86797).

Single-Post-and-Basin Structures

Four samples submitted for dating were collected from within single-post-and-basin structures. Feature 23, is a rectangular feature about 3.4-x-2.8 m in extent that is defined by a nearly complete array of post molds representing the walls of this structure. In profile the basin was found to extend 22 cm below the machine-stripped surface. In all, 41 post molds, including six internal posts, were mapped as part of this structure. Ceramic sherds, lithic debris, and limestone fragments were abundant throughout the fill. A total of 10.4 g of charcoal, consisting primarily of charred oak wood with a few fragments of hickory nutshell, was collected from the basin fill. A conventional radiocarbon date of 1110±50 B.P. (Beta-86792) was obtained for this sample.

Feature 159 is a rectangular structure about 4.0-x-2.73 m in plan view. The basin was found to extend only 12 cm below the stripped surface. Material recovered from the basin fill included sherds, lithic debris, and limestone fragments. Charred wood and nutshell also was recovered, mainly from the southeast quarter of the basin where a distinct, charcoal-rich area was noted during excavation of the house basin. This portion of the floor may represent a hearth area. A total of 25.4 g of charcoal, consisting of oak wood with several hickory and black walnut nutshell fragments, was collected and submitted for dating. This structure is dated at 930±60 B.P. (Beta-86798).

Feature 221 is a rectangular structure measuring 4.24-x-2.30 m in plan view. Only four possible post molds were noted during the excavation of this feature along the northern edge of the basin, which extended to approximately 24 cm below the stripped surface. An internal concentration of charcoal, ceramic sherds, debitage, and limestone fragments was noted in the northeast quarter of the basin. An 8.5-g sample of wood charcoal collected from the west half of the basin fill was submitted for dating and produced a conventional date of 940±070 B.P. (Beta-86800).

The final single-post-and-basin-structure to be dated, Feature 222, is a 3.36-x-2.59-m rectangular stain, the outer limits of which are delineated by 34 post molds. In addition to the external wall post molds, a single internal post mold was identified within the basin. In profile, the basin was found to be 19-cm deep and contained ceramics, charcoal, and lithic debris. A total of 9.5 g of oak and ring-porous wood charcoal collected from the east half of the basin was submitted for dating. This sample yielded a date of 760±70 B.P. (Beta-86801).

Wall-Trench Structure

A single radiocarbon date was obtained from Feature 9/158, a wall-trench structure. Feature 9/158 is 4.82-x-2.42 m in plan and is notable for the large quantity of charred material on the stripped surface. This structure appears to have burned and collapsed following its abandonment. Charred structural elements and grass matting were abundant in the basin. Charred maize cob fragments and a large amount of nutshell and smaller wood fragments also were recovered. A 35.3 g sample of charred hickory nutshell and grass was collected from the northeast quarter of the basin and submitted for dating, producing a conventional date of 1010±60 B.P. (Beta-86791).

Mortuary Features

The final two dates obtained for the Stemler Bluff site are from mortuary feature samples. Feature 203 is an oblong pit about 1.33 m in length and 55 cm wide, with a maximum depth of 23 cm. This feature contained two linear concentrations of charcoal at 21 cm below the stripped surface. These concentrations were located along the long axis of the feature with the intervening fill described as ashy. A charcoal concentration was also noted 9 cm below the stripped surface. A sample of wood charcoal, identified as oak with some ring-porous hardwood, weighing 35.3 g, was submitted for radiometric dating. This sample is dated at 970±60 B.P. (Beta-86799).

Feature 217, an oblong pit measuring 92-x-80 cm and 40 cm deep, is similar in morphology to Feature 203. Charred wood was located along either side of the long axis of the pit, and the fill is described as ashy. Little bone or other materials was noted during excavation of this feature. A sample of 62.4 g of ring-porous hardwood was submitted for assay and yielded a date of 930±60 B.P. (Beta-79830).

Discussion

The radiocarbon dates obtained at Stemler Bluff indicate that the site was occupied over a span of at least 300 years during the Emergent Mississippian and Mississippian periods. The degree of overlap in the standard deviations of the conventional radiocarbon dates suggests that the occupations represented at the site occurred without significant periods of site abandonment. This may represent a series of upland margin farmsteads consisting of one or several households that were occupied for a period of several years within a settlement system based on shifting slash-and-burn cultivation in forest margin habitats above the American Bottom floodplain.

The 13 radiocarbon dates obtained from Stemler Bluff fit within the existing American Bottom chronology established for the Emergent Mississippian and Mississippian periods, and the nature and type of the dated features do not indicate any significant variation from previously identified upland sites dating to this period. At this point, no attempt will be made to assign the Stemler Bluff site radiocarbon dates to specific cultural phases as these are largely defined by ceramic assemblages. Such phase assignments will be suggested following the presentation of the ceramic data in Chapter 5.

CHAPTER 5.
CERAMIC ANALYSIS

Prehistoric ceramics were found in 163 of the 218 features at 11MO891. In addition, ceramics were analyzed from several proveniences that later were determined not to be features. The sherds and burned clay/daub from these proveniences are included in the totals presented in this chapter. In all, 13,815 ceramic sherds weighing approximately 108,000 g were analyzed. The remaining fragments passed through a 7/16-inch geological sieve and were classified as sherdlettes. These fragments were counted (n=17,000) and weighed (12,990 g) but not further analyzed. Also recovered were 8,262 fragments of burned clay/daub weighing approximately 12,000 g. Almost all of the material was found in the main occupation area; only ninety sherds and pieces of burned clay/daub were recovered from the mortuary area. Vessel form could not be determined for any rims from the mortuary area. The figures illustrated in the Attribute Analysis and Vessel Types sections present the spatial distributions of material within the main occupation area. Mortuary area ceramics are described in a separate section. Ceramics were present in the analyzed flotation samples but were not analyzed. The samples were scanned for distinctive ceramics, but none were found. A complete inventory of the analyzed ceramics is provided in Appendix B.

The goals of this analysis are to describe the ceramics from Stemler Bluff and to place the assemblage within the established temporal framework for the American Bottom. To this end, the analytical methods follow those of some researchers for assemblages from the FAI-270 project. First, reconstructions of rim sherds, and body sherds to rim sherds, were made to establish final sherd and vessel counts for each feature. Vessel counts were derived from rim counts. Second, an inventory for each feature was completed, and data were collected on a series of attributes. Fewer attributes were recorded for body sherds than rim sherds. Body sherds were analyzed for temper, surface, and decorative attributes (Table 5-1). They were not further analyzed unless temper, surface treatment, or decoration was atypical of the assemblage. Rim sherds were analyzed minimally for temper, surface treatment, and decoration as well (Table 5-2). If vessel form could be determined, additional attributes were recorded: lip treatment, rim thickness, orifice diameter, and vessel height. Rim profiles were drawn and orifice diameters were measured. Rim sherds were used to determine vessel form. Finally, comparisons of ceramic types and vessel forms were made across features to determine chronological and functional differences within the overall assemblage, the results of which are presented at the end of this chapter. Attributes that were recorded are defined in detail in the following section.

Attribute Analysis

The attributes recorded from the ceramic assemblage at Stemler Bluff are similar to those recorded in other ceramic analyses conducted on Emergent Mississippian and Mississippian assemblages from the American Bottom (e.g., Fortier 1996; Fortier et al. 1991; Kelly et al. 1990; McElrath and Finney 1987; Stahl 1985). Reliance is mainly on the analyses of Marge (11MO99) in Monroe County and Range, George Reeves, and Dohack in St. Clair County since published data are available for those sites. Qualitative attributes recorded for the ceramics include temper, surface treatment, and vessel form. Quantitative attributes include rim thickness, orifice diameter, and vessel height. These dimensional data were collected from the 300 rim sherds for which rim orientation could be determined. Figure 5-1 illustrates how dimensions were measured and provides a key to the rim profile data that are presented with the rim profile figures. Definitions of attributes and descriptions of analytical methods are presented below, and summary information for the ceramic assemblage is included as well. Detailed discussion of the assemblage is presented later in the chapter.

Table 5-1. Temper and Surface Treatment of Body Sherds.

Surface	Temper											
	Limestone		Grog		Grit		Limestone/Grit		Shell		Limestone/Grog	
Treatment	n	wt.	n	wt.	n	wt.	n	wt.	n	wt.	n	wt.
Plain	1,372	6,119.4	168	782.0	104	572.1	41	154.5	101	411.0	16	104.8
Cordmarked	7,153	55,462.4	628	3,995.2	280	2,199.4	276	1,611.5	36	474.0	39	352.1
PL/CM	110	2,180.9	24	222.0	77	864.2	2	29.2	2	18.7	3	68.6
SMCM	736	6,162.9	116	702.5	13	59.8	60	452.9	10	134.2	0	0.0
RS	148	719.5	8	35.8	0	0.0	3	9.8	28	323.4	0	0.0
RS/CM	13	64.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
RS/IN	0	0.0	0	0.0	0	0.0	0	0.0	1	2.8	0	0.0
Punctate	0	0.0	1	51.8	0	0.0	0	0.0	0	0.0	0	0.0
Incised	4	19.4	3	8.0	1	3.3	0	0.0	2	10.4	0	0.0
Eroded	1,026	2,716.2	40	118.6	8	26.0	50	110.6	16	33.6	26	78.9
Total	10,562	73,445.5	988	5,915.9	483	3,724.8	432	2,368.5	196	1,408.1	84	604.4

Surface	Temper									
	Grit/Grog		Shell/Limestone		Shell/Grog		No Temper		Shell/Grit	
Treatment	n	wt.	n	wt.	n	wt.	n	wt.	n	wt.
Plain	4	36.5	18	117.7	29	217.1	18	118.6	17	126.0
Cordmarked	42	341.5	24	72.5	19	132.8	1	3.1	1	32.7
PL/CM	1	6.8	1	95.7	0	0.0	0	0.0	0	0.0
SMCM	0	0.0	3	19.1	0	0.0	0	0.0	0	0.0
RS	0	0.0	1	5.8	0	0.0	0	0.0	0	0.0
RS/CM	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
RS/IN	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Punctate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Incised	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Eroded	3	5.4	1	1.6	0	0.0	0	0.0	0	0.0
Total	50	390.2	48	312.4	48	349.9	19	121.7	18	158.7

Note: PL/CM is plain and cordmarked; SMCM is smoothed cordmarked; RS is red slipped; RS/CM is red slipped and cordmarked; and RS/IN is red slipped and incised. All weights are in grams.

Table 5-2. Temper and Surface Treatment of Rims.

Surface	Temper											
	Limestone		Grog		Grit		Limestone/Grit		Shell		Limestone/Grog	
Treatment	n	wt.	n	wt.	n	wt.	n	wt.	n	wt.	n	wt.
Plain	263	3,625.8	21	135.9	24	320.6	5	56.7	5	33.1	1	2.2
Cordmarked	347	8,533.1	36	368.0	9	81.8	28	674.5	2	11.8	4	99.8
PL/CM	35	2,685.9	1	197.8	1	94.8	0	0.0	0	0.0	0	0.0
SMCM	31	648.7	1	4.4	1	7.1	4	155.3	0	0.0	1	6.5
CM/SMCM	1	190.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
RS	29	498.0	2	13.5	0	0.0	0	0.0	0	0.0	0	0.0
RS/CM	1	14.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Incised	2	40.9	0	0.0	1	1.6	0	0.0	0	0.0	0	0.0
Eroded	14	97.5	2	14.6	0	0.0	5	15.9	0	0.0	0	0.0
Total	723	16,335.0	63	734.2	36	505.9	42	902.4	7	44.9	6	108.5

Surface	Temper									
	Grit/Grog		Shell/Limestone		Shell/Grog		No Temper		Shell/Grit	
Treatment	n	wt.	n	wt.	n	wt.	n	wt.	n	wt.
Plain	0	0.0	0	0.0	2	27.1	3	14.5	2	96.8
Cordmarked	1	4.2	1	27.4	0	0.0	0	0.0	0	0.0
PL/CM	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
SMCM	0	0.0	1	6.0	0	0.0	0	0.0	0	0.0
CM/SMCM	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
RS	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
RS/CM	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Incised	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Eroded	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	1	4.2	2	33.4	2	27.1	3	14.5	2	96.8

Note: CM/SMCM is cordmarked and smoothed cordmarked. All weights are in grams.

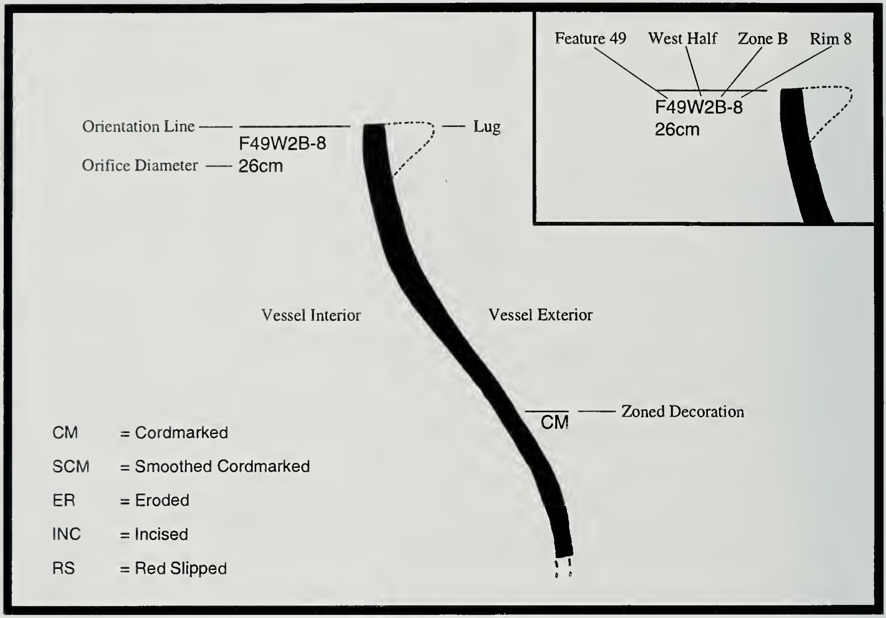

Figure 5-1. Key to Rim Orientation and Attribute Data.

Vessel Form

Several vessel forms are commonly recovered at Emergent Mississippian and Mississippian sites including jars, bowls, pinch pots, stumpware, bottles, and funnels. Jars exhibit contour changes that correspond to a neck and shoulder (Holley 1989:14). Bowls have simple contour shapes with height equal to or less than one-third of the orifice diameter (Holley 1989:15). Pinch pots are miniature vessels, usually formed from a single lump of clay that are crudely shaped jars or bowls (Kelly et al. 1990:167). Stumpware consists of grog- or limestone-tempered vessels that are "footed cones" with thickened and cordmarked walls, the interiors of which may be closed or have holes at the base or sides (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984:134). Bottles are vessels with a composite silhouette consisting of a cylindrical neck and globular body (Holley 1989:16). Funnels are vessels with a hollow base and are cylindrical to globular in shape (Holley 1989:16).

Vessel form could be determined for 300 rims in the Stemler Bluff assemblage, and three vessel forms were identified: jars, bowls, and pinch pots (Figure 5-2). Jars dominate the identified assemblage (n=185, 61.7 percent), followed by bowls (n=105, 35.0 percent), and pinch pots (n=10, 3.3 percent). No stumpware, funnels, or bottles (with one possible exception) were recovered from the site.

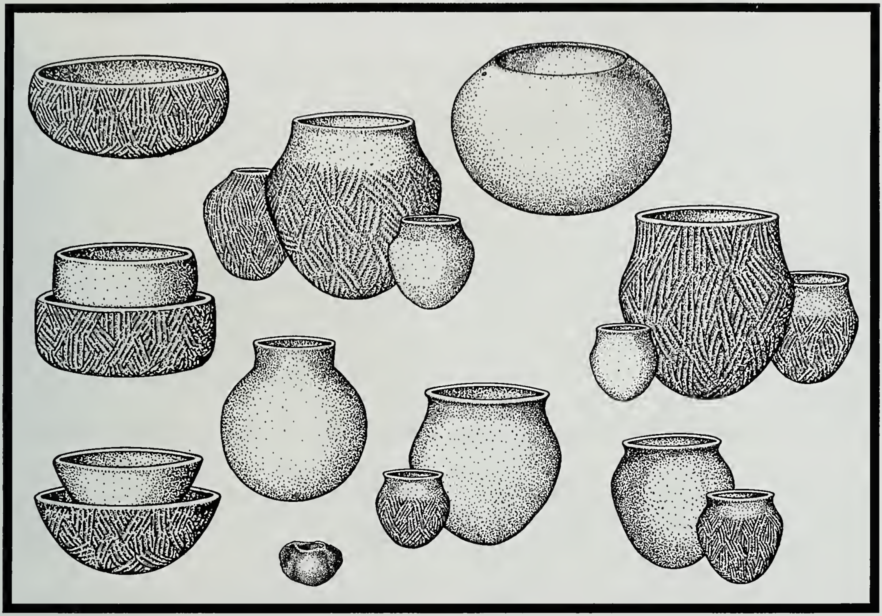

Figure 5-2. Composite Sketch of the Stemler Bluff Ceramic Assemblage.

Temper

Temper is aplastic material added to clay to counteract shrinking and uneven drying and thus reduce the risk of cracking when vessels are fired (Shepard 1963:25). Identification of temper was made macroscopically. Most sherds in the Stemler Bluff assemblage contain a single tempering agent, but those that show two materials (a 3:1 ratio or closer) are defined as having two agents.

Limestone is the most common tempering agent in the assemblage and is characteristic of Emergent Mississippian and Mississippian ceramics from sites in the southern portion of the American Bottom (Holley 1989; Kelly et al. 1990; McElrath and Finney 1987; Stahl 1985). Limestone is readily available in this area, and the location of 11MO891 on the upland limestone bluffs would have made this an easily collected resource. In all, 11,285 sherds are limestone tempered, representing 82 percent of the assemblage (Tables 5-1 and 5-2). A larger percentage of bowls than jars are tempered with limestone (Table 5-3). Limestone-tempered vessels are distributed across most features at 11MO891 (Figure 5-3).

Grog temper (crushed ceramics) predominates in Late Woodland period ceramics but is also present in Emergent Mississippian ceramics. The shift to a limestone-dominated assemblage is one of the characteristics of the Emergent Mississippian period (Kelly 1990b:75). Interestingly, grog represents the

Table 5-3. Vessel Form by Temper Type.

	Jars		Bowls		Pinch Pots		Total	
Temper	n	%	n	%	n	%	n	%
Limestone	147	79	96	91	1	10	244	81
Grog	13	7	3	3	5	50	21	7
Shell	2	1	0	0	1	10	3	1
Grit	10	5	0	0	2	20	12	4
Shell/Grog	1	<1	0	0	0	0	1	<1
Limestone/Shell	0	0	1	<1	0	0	1	<1
Limestone/Grit	8	4	4	4	0	0	12	4
Limestone/Grog	1	<1	1	<1	0	0	2	<1
Shell/Grit	3	2	0	0	0	0	3	1
No Temper	0	0	0	0	1	10	1	<1
Total	185	100	105	100	10	100	300	100

second most common tempering agent in the 11MO891 assemblage, although limestone temper is far more common. A total of 1,051 grog-tempered sherds is present (8 percent) (Tables 5-1 and 5-2). Slightly more jars are grog tempered than are bowls (Table 5-3). Grog-tempered ceramics are present in a number of features across the site, although usually in small quantities (Figure 5-4). Only four grog-tempered sherds are from vessels with Madison County Shale paste (described below).

Grit-tempered ceramics comprise a smaller percentage of the assemblage (n=519, 4 percent) (Tables 5-1 and 5-2). The sample includes those with Madison County Shale (MCS) paste. This paste, originally defined by Porter (1963, 1984), is characterized by pinkish to white color, relative hardness, and grit temper with biotite flecks. The shales from which this paste is derived are located in the northern part of the American Bottom, suggesting interregional trade (Kelly et al. 1990). In all, 291 (2 percent) MCS sherds were identified in the assemblage. A few of the MCS ceramics from 11MO891 have temper composed almost entirely of quartz (n=40). Of the non-MCS vessels, only ten jars and one pinch pot have grit temper (Table 5-3). Grit-tempered ceramics also are present in a number of features across the site whereas those with MCS paste have a more limited distribution (Figure 5-5).

Shell-tempered ceramics first appear during the George Reeves phase in the American Bottom, probably from nonlocal sources (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984:142). They become more prevalent through time, although shell temper is never ubiquitous at sites in the southern American Bottom. In all, 203 shell-tempered sherds were recovered from 11MO891, representing one percent of the ceramic assemblage (Tables 5-1 and 5-2). Only two jars and one pinch pot were identified with shell temper (Table 5-3). The distribution of shell-tempered ceramics across features is limited, but there appear to be three clusters, perhaps representing discrete occupations (Figure 5-6).

A few sherds are tempered with the following combinations of agents: limestone and grit (n=474, 3 percent); limestone and grog (n=90, <1 percent); grit and grog (n=51, <1 percent); shell and limestone (n=50, <1 percent), shell and grog (n=50, <1 percent); and shell and grit (n=20, <1 percent). Twenty-two sherds (< 1 percent) contain no temper,

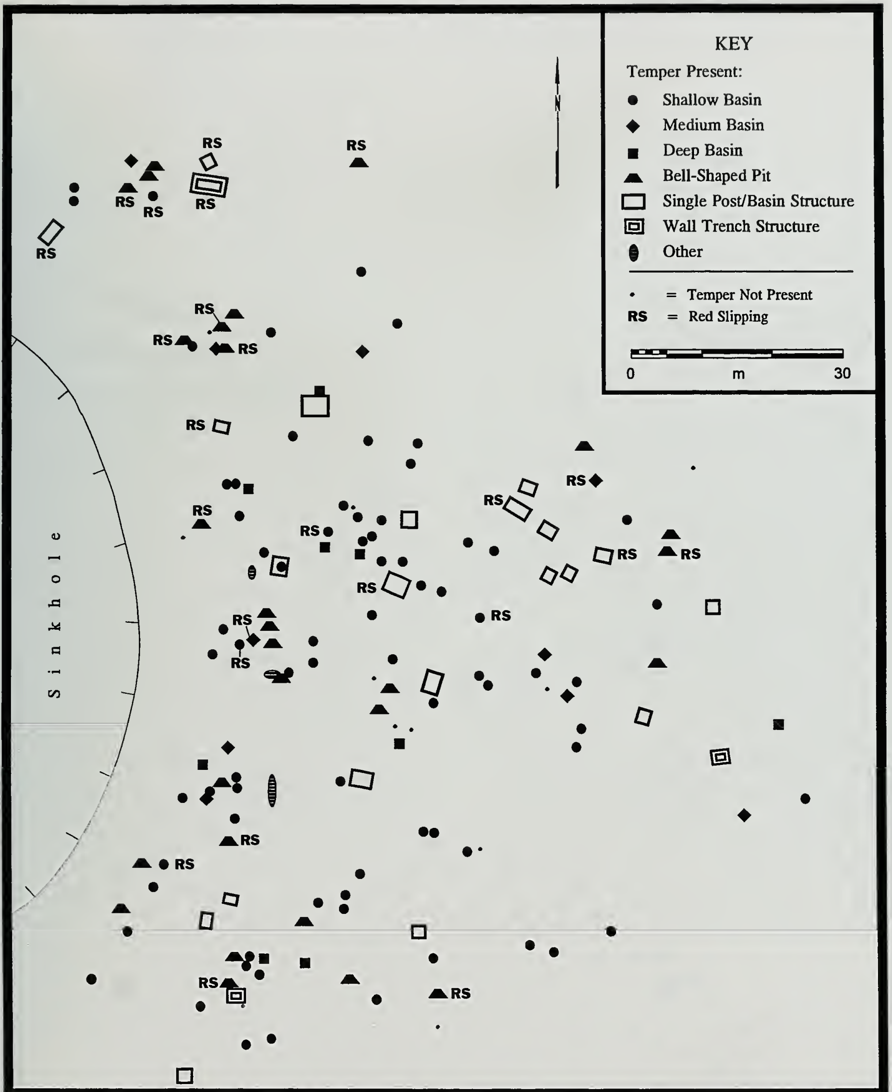

Figure 5-3. Distribution of Limestone-Tempered Sherds Across Features.

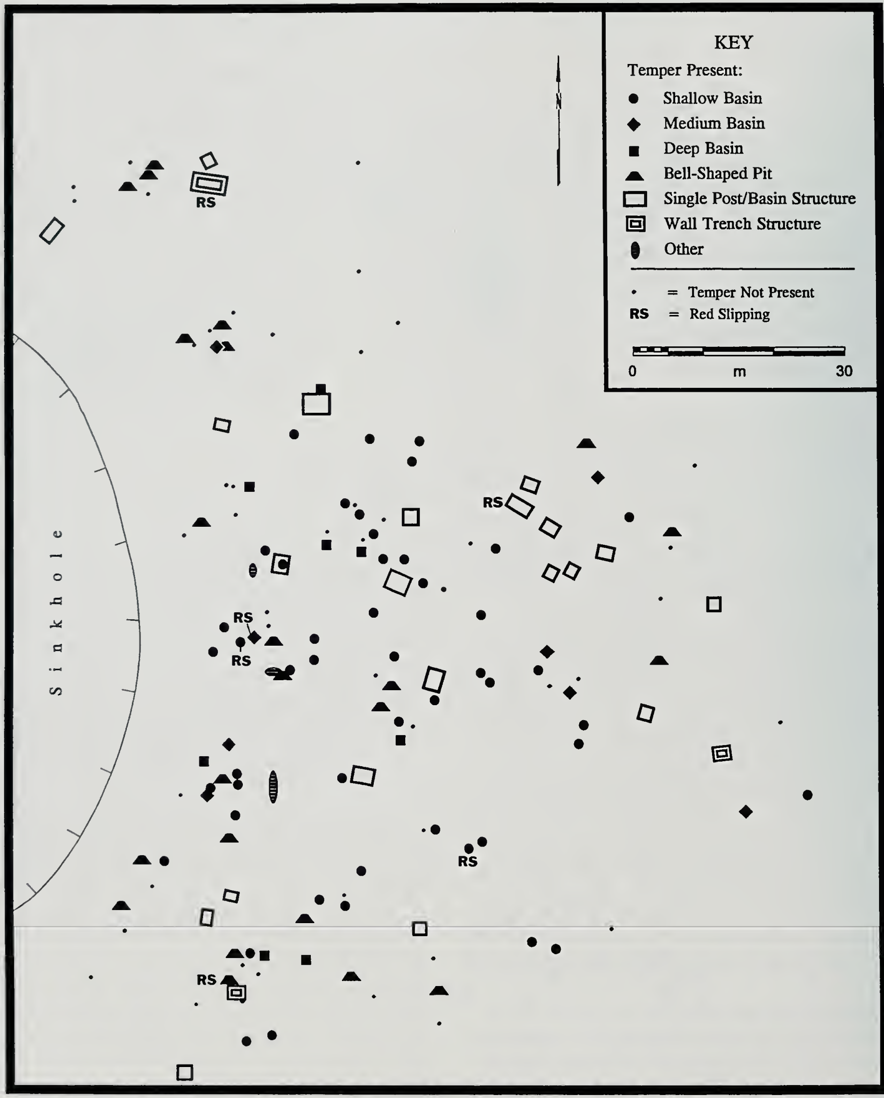

Figure 5-4. Distribution of Grog-Tempered Sherds Across Features.

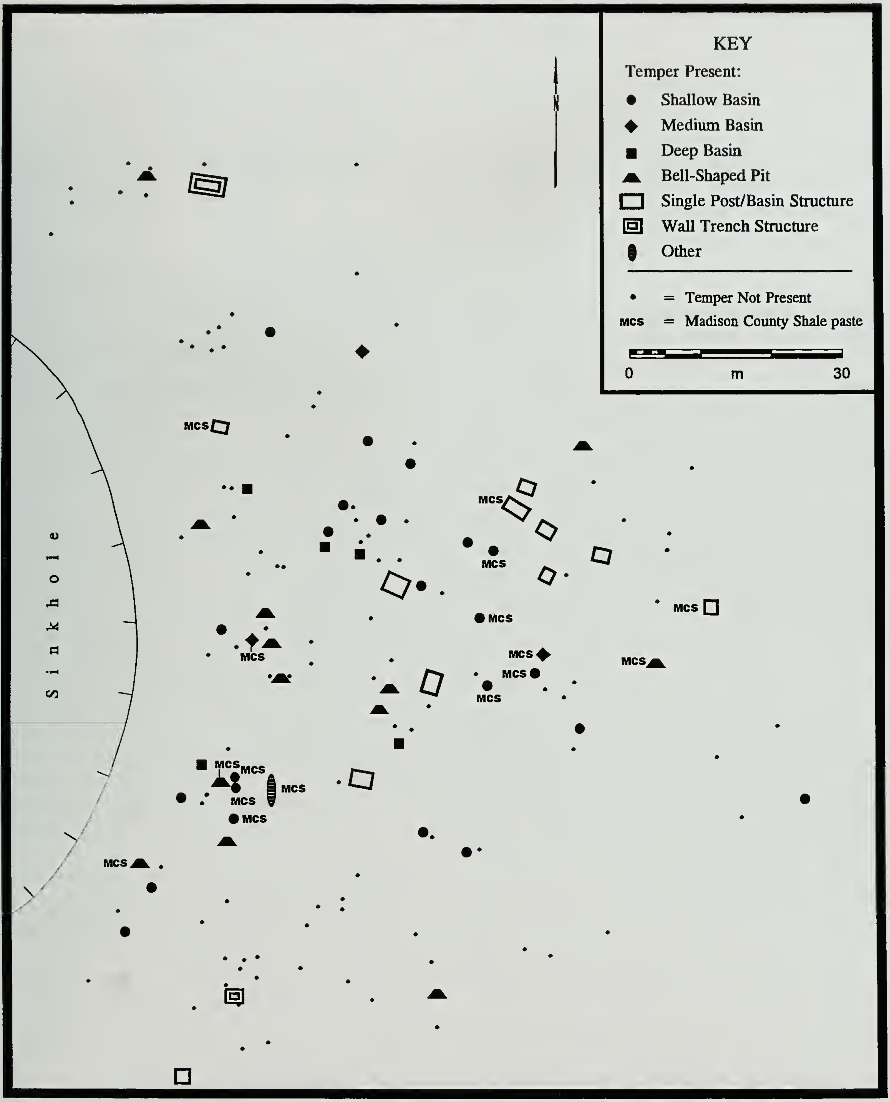

Figure 5-5. Distribution of Grit-Tempered Sherds Across Features.

Figure 5-6. Distribution of Shell-Tempered Sherds Across Features.

probably all of which represent pinch pots (Tables 5-1 and 5-2; Figure 5-7). Both jars and bowls were identified with the combinations of temper (Table 5-3). These combinations appear to follow the spatial distribution of their single-temper counterparts.

Surface Treatment

The number of surface treatments present in the Stemler Bluff assemblage is limited, but representative of ceramic assemblages from the American Bottom. Sherds were classified as plain, cordmarked, plain and cordmarked, smoothed cordmarked, red slipped, red slipped and cordmarked, or eroded. Cordmarked ceramics show a clear shift in the American Bottom between the Late Woodland and Emergent Mississippian periods. During the Late Woodland period, S-twist cordage predominated, but most cordmarked sherds from Emergent Mississippian assemblages exhibit Z-twist cordage (Kelly 1980; Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984; Maher 1987; Munson 1971; Stahl 1985). Hall (1980) has suggested that the change represents a shift from a hand-and-thigh method of rolling fiber to the use of spindle whorls. In the Stemler Bluff analysis, an attempt was made to distinguish intentional from incidental smoothing of the cordmarking. A gradual shift from cordmarked to plain surfaces on American Bottom ceramics has been identified for the Emergent Mississippian period as well (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984).

Table 5-4 presents the types of surface treatment for identified vessels in the Stemler Bluff assemblage as well as the decorative techniques of incision and punctation. Although jars appear mainly to be plain, this is probably not the case. Many of these rims are probably from plain and cordmarked vessels rather than plain; in reality, only two jars are complete enough to be classified as completely uncordmarked. By far, most bowls are cordmarked, which is characteristic of the Emergent Mississippian period in the American Bottom. Other decorative treatments are not well-represented among identified vessels or body sherds. Smoothed cordmarking was recorded for 978 (7 percent) sherds. Red slip was noted on 234 (2 percent) sherds, of which 14 also are cordmarked and one is incised. Of the red-slipped sherds, 191 are limestone tempered, 29 are shell tempered, and 10 are grog tempered. Four red-slipped sherds are tempered with both shell and limestone, and three are tempered with both grit and limestone.

Time constraints limited determination of cord twist to a sample of rims, mainly those for which vessel profiles were drawn. Of the 488 analyzed rims, 204 are plain (41.8 percent), 188 show Z-twist cordage (38.5 percent), 39 have S-twist cordage (8.0 percent), and 1 has both Z-twist and S-twist (<1 percent). Cord twist could not be determined for 56 rims (11.5 percent). Of the 228 rims for which cordmarking could be determined, 82.5 percent show Z-twist and 17.1 percent exhibit S-twist cordage. The proportion is similar to that identified for the Emergent Mississippian phases at the Range site (Kelly et al. 1990:121). The two cord twists show little clustering by feature.

Decorative Treatment

As seen in Table 5-5, only a small percentage of the assemblage shows any decorative elements (n=115, .8 percent). Decoration is limited mainly to the lips of vessels in the form of stick impressions and lugs, which are almost entirely confined to the top and exterior of the lip; few rims have interior decoration. Also present on rims are fingernail-impressed lugs and notching. Drilled holes, both prefired and postfired, and loop handles also are included here as are punctations and incisions (Figure 5-8). Stick impressions include those made with a plain stick (rounded, pointed or square) or a cordwrapped stick. These impressions are found mainly on the exterior surface of the lip and can be either continuous or discontinuous across the rim.

Lugs take a number of forms including rounded, triangular, and bilobed (Figure 5-8). Several large

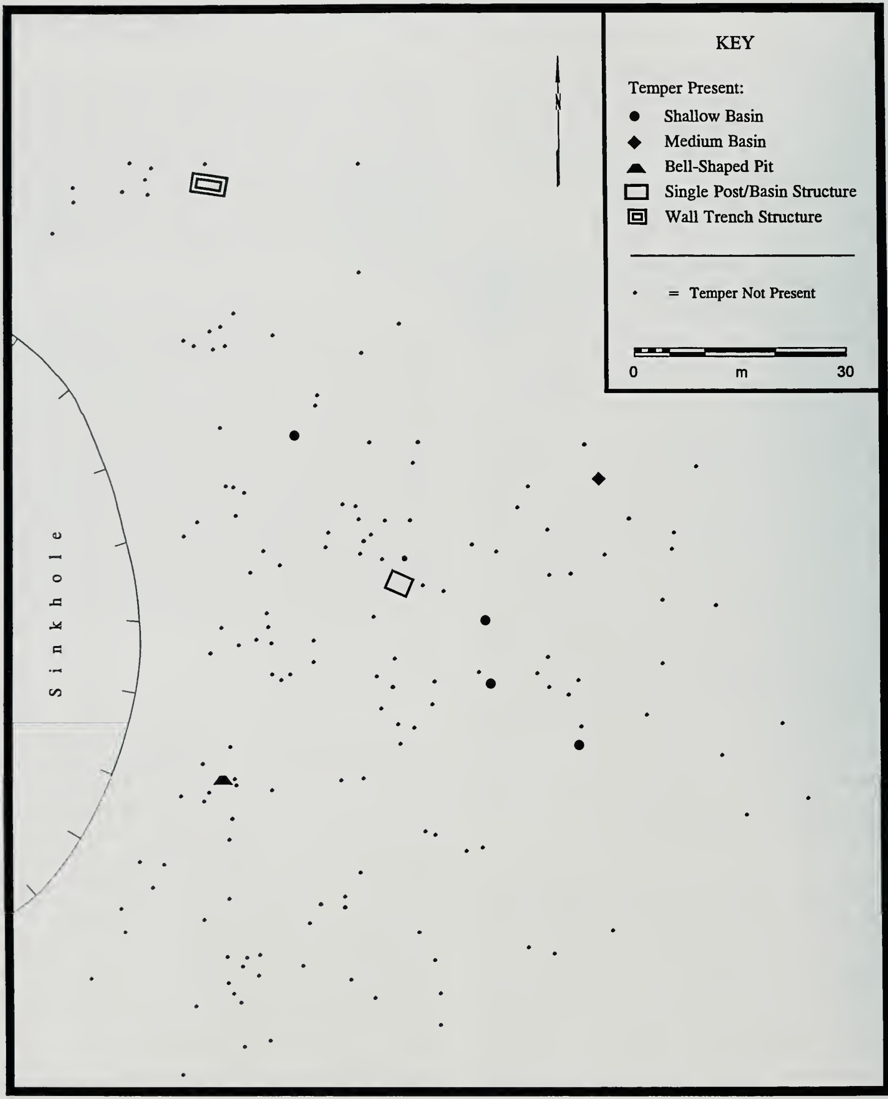

Figure 5-7. Distribution of Untempered Sherds Across Features.

Table 5-4. Vessel Form by Surface Treatment.

	Jars		Bowls		Pinch Pots	
Decoration	n	%	n	%	n	%
Plain	83	45	4	4	9	90
CM	54	29	91	87	0	0
PL/CM	28	15	1	1	0	0
SMCM	11	6	3	3	1	10
Red Slipped	5	3	4	4	0	0
RS/CM	0	0	1	1	0	0
Incised	2	1	0	0	0	0
CM/SMCM	1	<1	0	0	0	0
Eroded	1	<1	1	1	0	0
Total	185	100	105	100	10	100

Note: PL/CM is plain and cordmarked; SMCM is smoothed cordmarked; RS is red slipped; RS/CM is red slipped and cordmarked; and CM/SMCM is cordmarked and smoothed cordmarked.

Table 5-5. Vessel Form by Decorative Treatment.

	Jars		Bowls	
Decorative Treatment	n	% of All Jars	n	% of All Bowls
Cordmarked lip	0	0	5	5
Cordwrapped stick	2	1	2	2
Rounded stick	1	<1	2	2
Squared stick	2	1	1	1
Pointed stick	6	3	0	0
Notched	4	2	0	0
Prefired drilled hole	2	1	0	0
Postfired drilled hole	0	0	2	2
Round lug	10	5	0	0
Triangular lug	6	3	0	0
Bilobed lug	5	3	0	0
Round lug and cordwrapped stick	1	<1	0	0

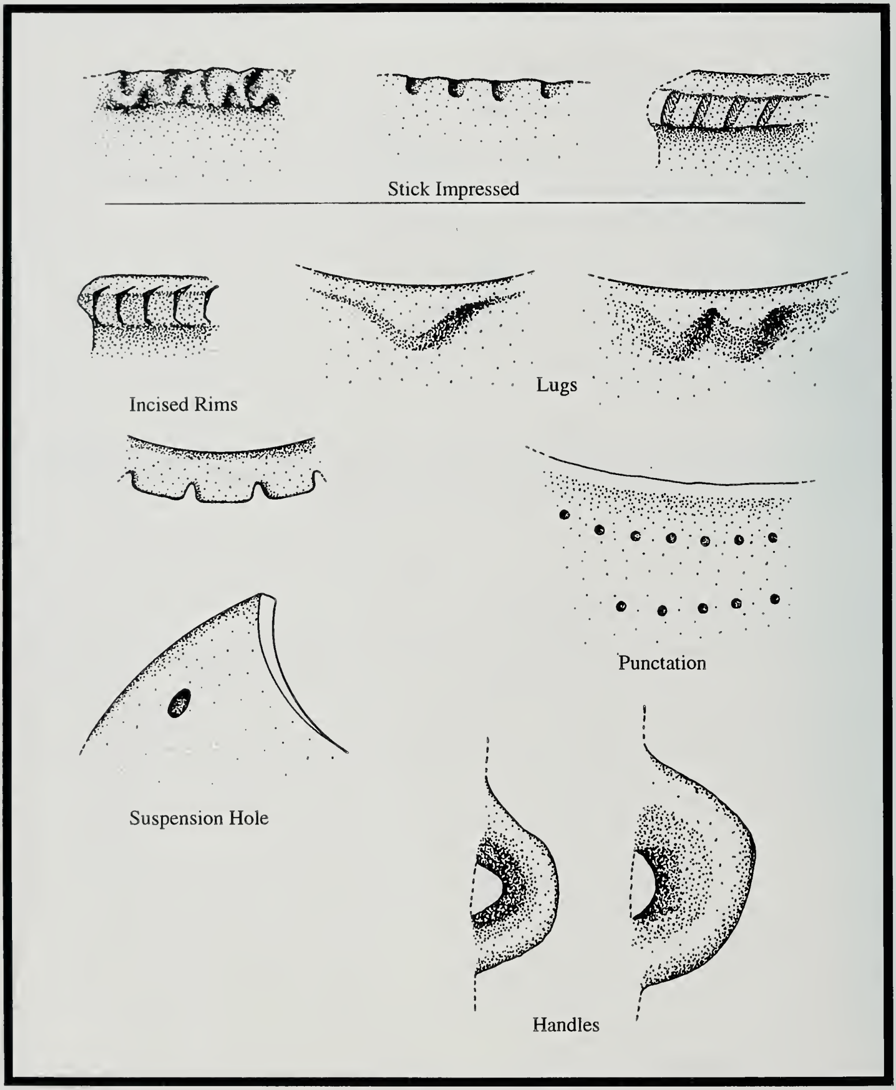

Figure 5-8. Key to Decorative Elements in the Stemler Bluff Ceramic Assemblage.

rims show sets of individual or paired lugs. Given the fragmentary nature of the vessels and the number of isolated lugs, an accurate determination of which vessel types included lugs is not possible. Although all lugs probably came from jars, not all jar types may have had lugs.

Five loop handles have been identified from four features in the Stemler Bluff assemblage. All are limestone tempered, with three being plain and two cordmarked. Kelly et al. (1990:396) note that at the Range site, loop handles first appear in the Range phase and become more common through time.

Punctations were identified on two sherds in the assemblage. One is a grog-tempered body sherd with crescent-shaped marks similar to those found on Middle Woodland types. The sherd, however, is too small to identify to a specific type. The marks were probably made with a stick rather than fingernail (Plate 5-1, a). The other is a Monks Mound Red seed jar that has a double row of punctations.

Incision is limited to 14 sherds (3 rims, 11 bodies) from ten features. Three shell-tempered body sherds, all from Feature 258, are of the Ramey Incised type (Plate 5-1, b-d). They are all severely eroded, and only one retains any trace of red slip. The sherds also are too fragmentary to determine orientation for the incisions or the original design. Given the degree of erosion, it is impossible to tell if the surface originally was as compact and polished as defined for the type (Vogel 1975:95). If not, these could represent a local imitation. Another jar body sherd has very compact, very pale brown (10YR7/4 to 10YR8/4) grit-tempered paste unlike that of other sherds in the assemblage (Plate 5-1, e). The design appears to be a series of triangles or chevrons. The sherd may represent a trade vessel and resembles Dillinger Decorated examples from southern Illinois (Maxwell 1951:Plate XXXIII, top center). The remaining body sherds (Plate 5-1, f-k) and rim sherds are too small be typed. One rim sherd of an untyped, very small jar also is grit tempered (Plate 5-1, l), with vertical incisions at the rim. The remaining two rims are from identified jars and are discussed below.

Lip Treatment

Lip treatment is defined simply as flat, rounded, or indeterminate (Table 5-6). The flat category includes both square and beveled lips. "Extruded" lips are also placed in these categories since only the very edge of the lip was classified (cf. Kelly et al. 1990). Visual inspection of larger rims indicates that both flat and rounded treatment can be present on a single vessel and that lip treatment was not standardized. By far, however, flat rims predominate on both jars and bowls.

Rim Thickness

Three measurements were taken at or near the lip of rim sherds to determine average vessel wall thickness. When lugs were present, measurements were taken directly below them for more accuracy. Figure 5-9 (top) shows the distribution of rim thickness for bowls and jars. Overall, bowls tend to be thicker than jars, although jars have a greater range of variation. The main cluster for bowls is between 4.5 and 7.0 mm while that for jars is between 4.0 and 6.0 mm. Clustering of rim thickness for specific jar and bowl types is discussed in the section on vessel types.

Orifice Diameter

Orifice calculations were made for rims that represent as least five percent of a vessel. Distributions by diameter and vessel form are shown in Figure 5-9 (bottom). Bowls range from 16 to 46 cm in diameter and appear to exhibit at least three clusters, which range from 16 to 22 cm, 30 to 36 cm, and 40 to 46 cm. Jars range from 6 to 39 cm in diameter and cluster mainly between 12 and 25 cm. Only one pinch pot is large enough to determine diameter (2 cm). Clustering of orifice diameters for specific jar and bowl types is discussed in the section on vessel types.

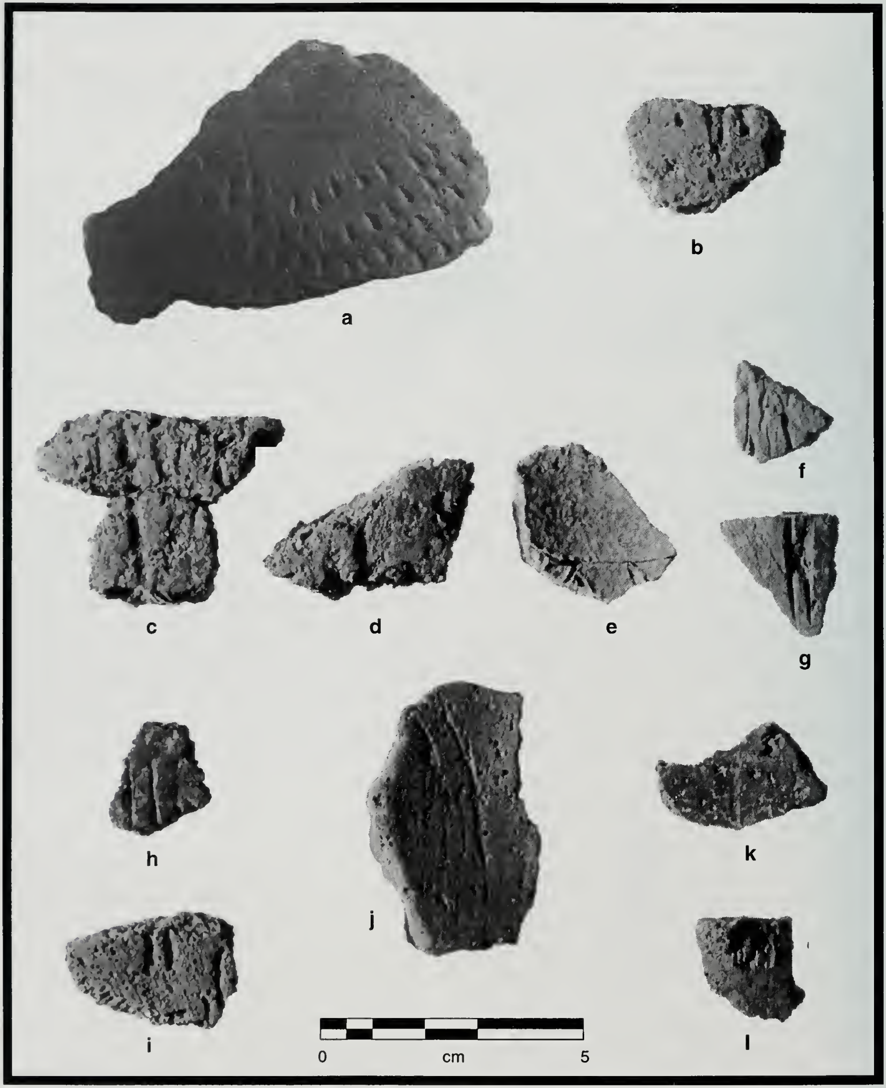

Plate 5-1. Middle Woodland and Incised Sherds; a, Middle Woodland Punctated Body; b-d, Ramey Incised Bodies; e, Possible Dillinger Decorated Body; f-k, Unidentified Incised Bodies; l, Unidentified Incised Rim.

Table 5-6. Lip Treatment by Vessel Form.

	Jars		Bowls	
Lip Treatment	n	% of All Jars	n	% of All Bowls
Flat	164	89	99	94
Rounded	18	10	5	5
Flat and rounded	1	<1	1	1
Indeterminate	2	1	0	0

Vessel Height

Vessel height could be determined for only four full-size vessels. The sample is too small for meaningful interpretations. Three jars measure 18.7, 18.0, and 24.5 cm in height. One bowl is 6.7 cm in height. Two pinch pots are 2.7 and 5.1 cm in height.

Vessel Types

As noted above, the ceramic assemblage from Stemler Bluff consists of jars, bowls, and pinch pots. The definitions given below mainly follow those used for the ceramic analysis of the Range site. Interestingly, stumpware, funnels, and bottles are absent, perhaps indicating that functional or cultural differences are present that distinguish the Stemler Bluff inhabitants from other Emergent Mississippian and Mississippian groups in the American Bottom. In all, 887 rims were present in 108 features, representing at least 235 vessels. Vessel form could be determined for 300 rims. In the following discussions, only photographs and profiles of larger or distinctive vessels are illustrated. Rim profiles for all rims for which orientation could be determined are presented in Appendix C.

Jars

Jars represent 61.7 percent (n=185) of the 300 rims whose forms could be determined. Six jar forms were identified, although only three types are common. Following previous analyses from Range, rim profiles are defined as inslanting, outslanting, or vertical (Kelly et al. 1987; Kelly et al. 1990). Angle measurements were taken 2 cm below the rim. Inslanting rims are defined as having an angle greater than 96 degrees. Outslanting rims have angles less than 84 degrees. Vertical rims range from 84 to 96 degrees. The "type" (i.e., vessel form) numbers described below correspond with those defined previously for Range (Kelly et al. 1987; Kelly et al. 1990). No Type 2 jars, which are typical of the Late Woodland Patrick phase, were identified in the Stemler Bluff assemblage.

Type 1. Type 1 jars have inslanted, outcurved rims (Figure 5-10, Plate 5-2). Only seven jars of this type are present, representing 3.8 percent of jars and 2.3 percent of all identifiable vessels. Four of these vessels are fully cordmarked; three are too small to determine if they are simply plain or plain and cordmarked. Four sherds are limestone tempered, one is grit tempered, one is grog tempered, and one of the cordmarked sherds is tempered with both limestone and grit. The grit-tempered sherd is of MCS paste and has a plain surface. None of the rims is decorated. Rim thickness ranges from 3.3 to 12.3 mm (Figure 5-11, top), although the thickness of five of the seven vessels ranges only from 4.0 to 6.5 mm. Orifice diameter could be determined for only two rims (Figure 5-12, top). At 10 and 15 cm, these rims fall within the normal range of jar diameters.

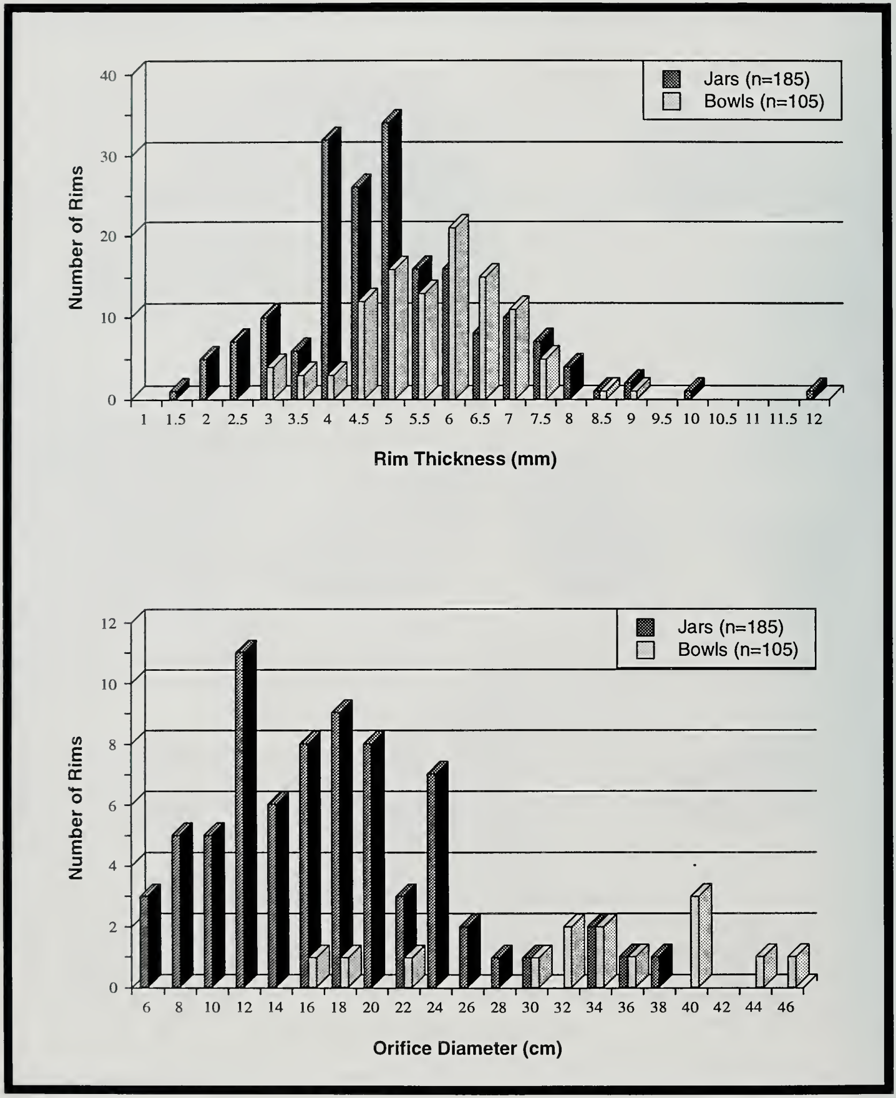

Figure 5-9. Rim Thickness (at top) and Orifice Diameters (at bottom) of Jars and Bowls.

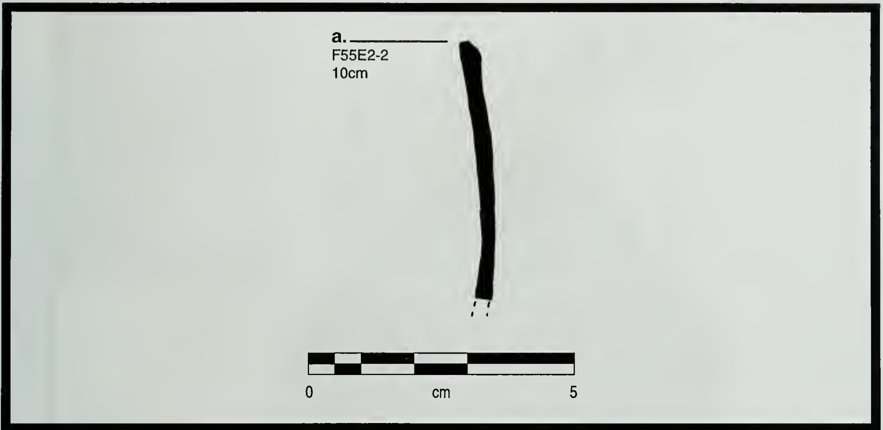

Figure 5-10. Representative Type 1 Jar Rim Profile.

One rim from Feature 79 is a plain, limestone-tempered seed jar (Plate 5-2). It has one complete and one incomplete prefired suspension hole. Orifice diameter is 15 cm, and the vessel measures 18.7 cm in height.

Type 3. Type 3 jars are characterized by inslanted, incurved rims (Figure 5-13, Plate 5-3). This is one of the two main jar types in the Stemler bluff assemblage with 77 rims, representing 41.6 percent of jars and 25.7 percent of all identifiable vessels. A number of surface treatments are present including plain (n=35), cordmarked (n=20), plain and cordmarked (n=13), smoothed cordmarked (n=3), red slipped (n=2), incised (n=2), cordmarked and smoothed cordmarked (n=1), and eroded (n=1). Limestone is the dominant temper (n=65), followed by grit (n=5), grog (n=4), limestone and grit (n=2), and shell (n=1). Four of the rims are from MCS vessels, two of which are plain and cordmarked and two are plain. One of the plain MCS rims is probably associated with body sherds from a plain and cordmarked vessel that are from the same feature.

Eighteen of the rims are decorated. Four have round lugs (Figure 5-13, a-c), two have bilobed lugs (Figure 5-13, d), and two have triangular lugs (Plate 5-3, a, d). One of the bilobed lugs, from Feature 79, almost could be described as two separate lugs. One of the rims sherds, from Feature 142, has three regularly spaced triangular lugs, suggesting a fourth was present on the complete rim. Two rims have bilobed lugs that are fingernail impressed (Figure 5-13, e-f). Other rims have been decorated with a cordwrapped stick (Figure 5-13, g-i), a rounded stick (Figure 5-13, j-k), and a pointed stick (Figure 5-13, l). The cordwrapped-stick decoration consists of a diagonal pattern across the superior surface of the rims. The two examples of rounded-stick decoration consist of diagonal patterns along the exterior of the rims. The rims are too small to determine if the decoration is continuous or discontinuous across the vessel. The rounded-stick decoration on one of these rims resembles that illustrated for Lindeman phase vessels from the Marge (Fortier 1996:Plate 12.5), Range (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984:Plate 27, a), and George

Plate 5-2. Type 1 Seed Jar from Feature 79. Inset shows suspension hole.

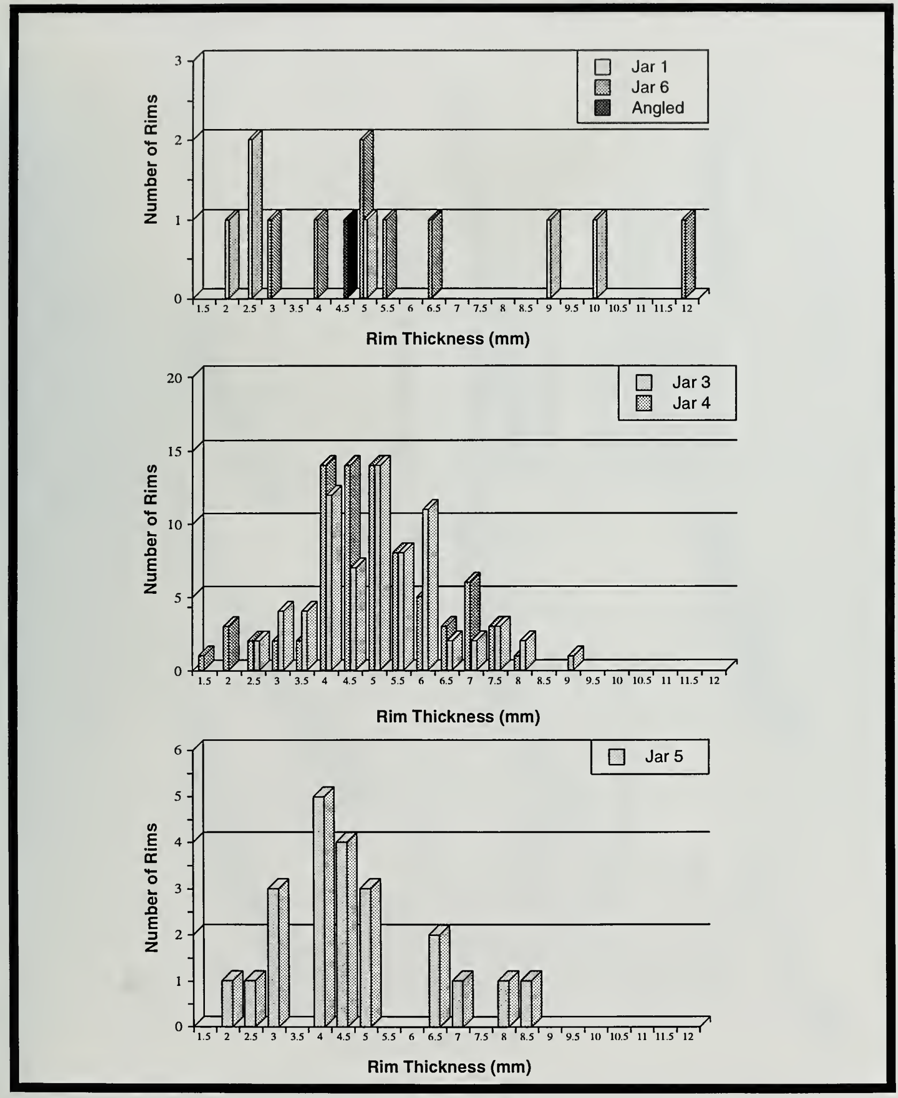

Figure 5-11. Frequency and Distribution of Rim Thickness for Jars.

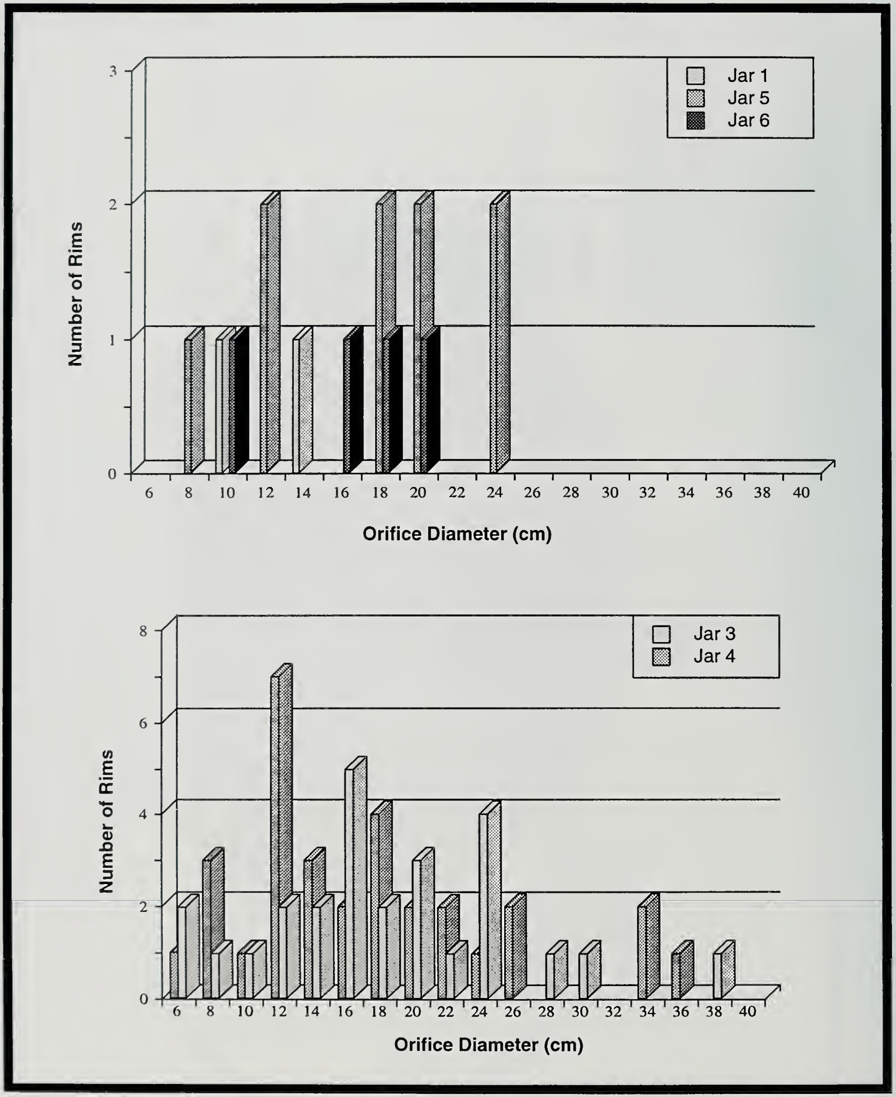

Figure 5-12. Frequency and Distribution of Orifice Diameter for Jars.

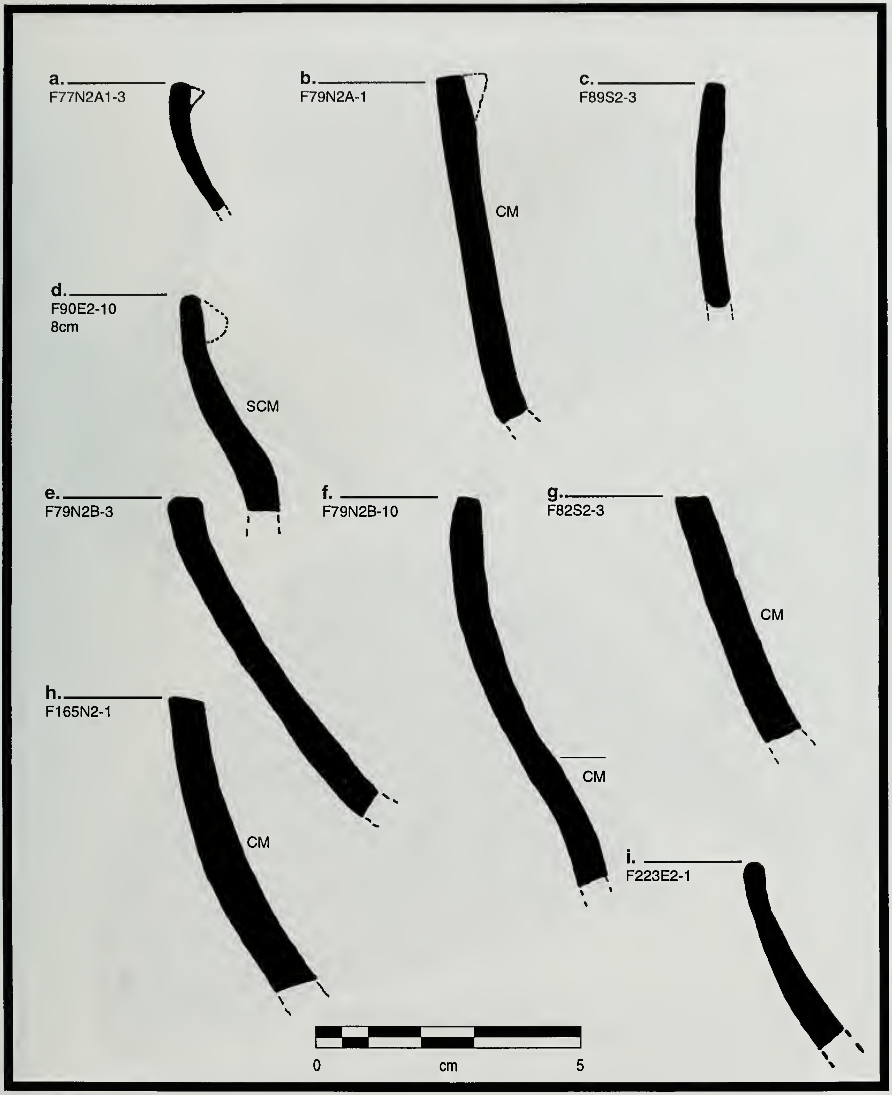

Figure 5-13. Representative Rim Profiles of Type 3 Jars.

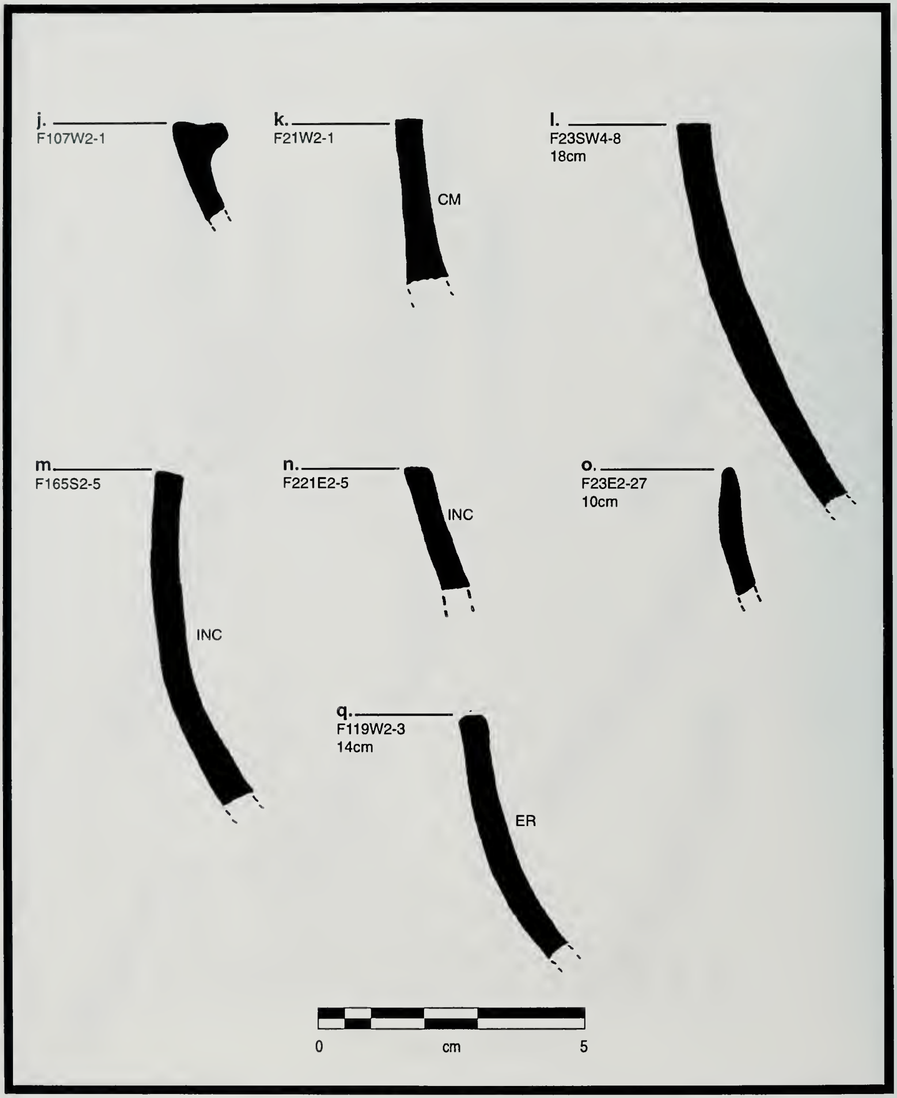

Figure 5-13. Continued.

Plate 5-3. Representative Type 3 Jars.

Plate 5-3. Continued.

Reeves sites (McElrath and Finney 1987:Figure 59). A third rim has rounded-stick decoration on the interior surface of the rim. The rim is completely cordmarked. Pointed-stick decoration takes the form of deep, discontinuous diagonal marks across the exterior of the rim.

Two rims have incised decoration. Both are limestone tempered. One (Figure 5-13, n) has four narrow, vertical incisions at the lower part of the neck that extend to the shoulder. The other (Figure 5-13, o) has two faint, diagonal slashes extending from the lip. Two even fainter diagonal lines run the opposite direction below the other two. Neither rim is large enough to match these decorations to a named type. Finally, three rims have prefired suspension holes (Figure 5-13, p-q; Plate 5-3, b).

One rim of this type, from Feature 223, represents a seed jar (Plate 5-3, b). It is limestone tempered and red slipped on both the interior and exterior surfaces and is probably of the named type Monks Mound Red (Vogel 1975). A double row of punctations is present as is a partial prefired suspension hole. This type is known from the George Reeves and Lindeman phases at Range and George Reeves (Kelly et al. 1990; McElrath and Finney 1987). Another jar (Plate 5-3, c) from Feature 142 also appears to be of the same named type.

Type 3 jars exhibit a fairly normal distribution in rim thickness from 1.5 to 9.4 mm (Figure 5-11, middle). Most fall between 4.0 and 7.4 mm. Orifice diameters range from 6 to 36 cm (Figure 5-12, bottom). One cluster is present from 34 to 36 cm. Additional clustering may be present from 6 to 10 cm, 12 to 18 cm, and 20 to 26 cm. One jar is 18.0 cm in height.

Type 4. Type 4 jars have vertical, incurved rims (Figure 5-14, Plate 5-4). This is the second most common jar type in the assemblage with 72 rims. These represent 38.9 percent of jars and 24.0 percent of the identified vessels. Surface treatments include plain (n=34), cordmarked (n=22), plain and cordmarked (n=10), smoothed cordmarked (n=5), and red slipped (n=1). Again, limestone temper dominates (n=59), followed by limestone and grit (n=5), grog (n=4), grit (n=3), and shell and grog (n=1). Two rims are from MCS vessels, both of which are plain but too small to determine if they are from plain and cordmarked vessels. The red-slipped rim is limestone tempered and probably represents a Monks Mound Red vessel.

Nineteen rims are decorated. Six rims have round lugs (Figure 5-14, a-d, Plate 5-4, a, c), two have triangular lugs (Figure 5-14, e-f), and two have bilobed lugs (Figure 5-14, g, Plate 5-4, f). One bilobed lug is fingernail impressed. The other, from Feature 229, protrudes more from the vessel rim than any other lug. Five rims have been decorated with a pointed stick (Figure 5-14, h-k, Plate 5-4, b, g) and two with a square stick (Figure 5-14, l, Plate 5-4, d). The pointed-stick decoration is located on the exterior of the lip and consists of diagonal or vertical marks. The depths of the marks vary between the rims. On one rim the decoration is clearly discontinuous and again resembles illustrations of a Lindeman phase rim from the Range site (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984:Plate 27, a). The square-stick decoration is vertical and discontinuous on the exterior of both rims. One sherd has a round lug and has been decorated in a diagonal pattern with a cordwrapped stick on the superior surface (Plate 5-4, h). Another has interior cordwrapped-stick decoration in a vertical pattern (Plate 5-4, e). Two rims have prefired suspension holes (Figure 5-14, m).

Type 4 jars show a normal distribution of rim thickness that ranges from 2.5 to 9.4 mm (Figure 5-11, middle). Orifice diameters exhibit some possible clustering from 6 to 10 cm, 12 to 18 cm, 20 to 26 cm, and 34 to 36 cm (Figure 5-12, bottom). Vessel height could be determined for two rims. These measure 22.0 and 24.5 cm.

Type 5. Type 5 jars are characterized by an outslanted, incurved (flared) rim (Figure 5-15, Plate 5-

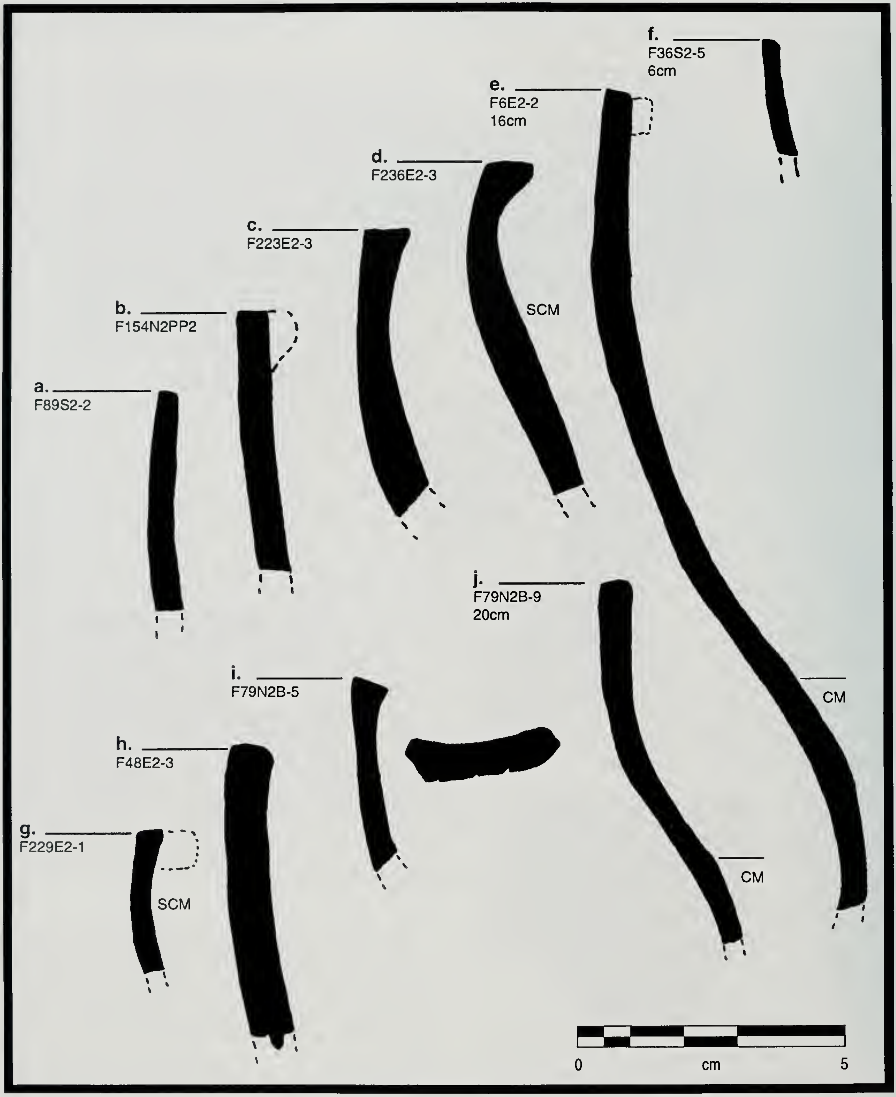

Figure 5-14. Representative Rim Profiles of Type 4 Jars.

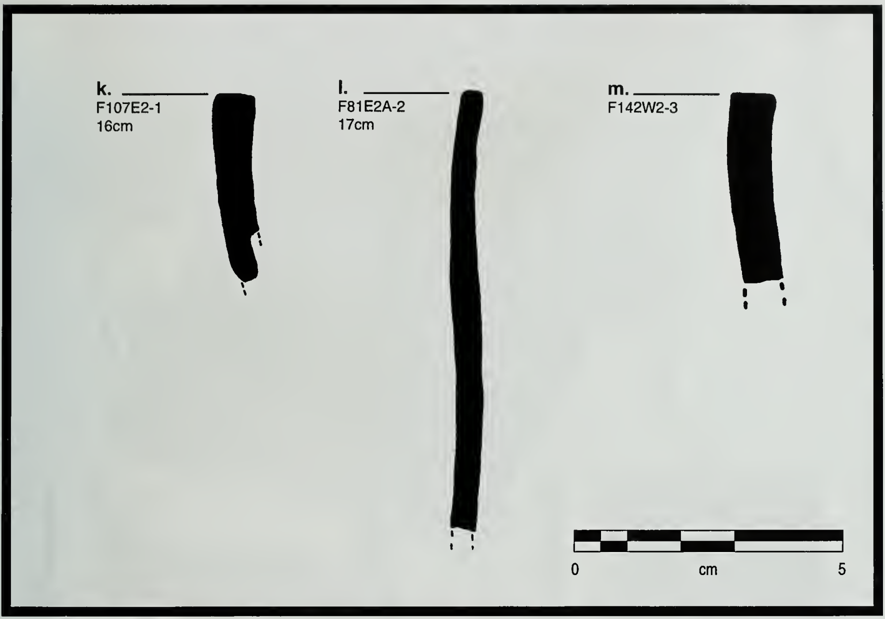

Figure 5-14. Concluded.

5). Twenty-two rims are present in the assemblage, representing 11.9 percent of jars and 7.3 percent of all identified vessels. Seven of the sherds are plain, eight are cordmarked, five are plain and cordmarked, and two are smoothed cordmarked. Limestone temper is dominant (n=17). Grog, grit, limestone and grog, limestone and grit, and shell and grit are each represented by only one sherd.

Two rims have triangular lugs (Figure 5-15, a-b), and one has a bilobed lug (Figure 5-15, c). Single examples of pointed- (Plate 5-5, b) and rounded-stick (Figure 5-15, e) decoration are present. Both of these decorations are composed of vertical marks on the rim exterior. The pointed-stick decoration appears to be continuous along the rim. Both of these rims, from Feature 79, resemble Lindeman phase examples from Marge (Fortier 1996:Plate 12.5) and Range (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984:Plate 27, a). One limestone-tempered rim has a loop handle (Figure 5-15, f).

Rim thickness varies from 2.0 to 8.9 mm, and four clusters may be seen in the distribution (Figure 5-11, bottom). These range from 2.0 to 3.4 mm, 4.0 to 5.4 mm, 6.5 to 7.4 mm, and 8.0 to 8.9 mm. Orifice diameters ranging from 8 to 24 cm could be determined for nine rims (Figure 5-12, top). The diameters appear to be distributed evenly.

Type 6. Type 6 jars have everted rims (Figure 5-16, Plate 5-6). Six rims of this type are present, repre-

Plate 5-4. Representative Type 4 Jars.

Plate 5-4. Continued.

Plate 5-4. Concluded.

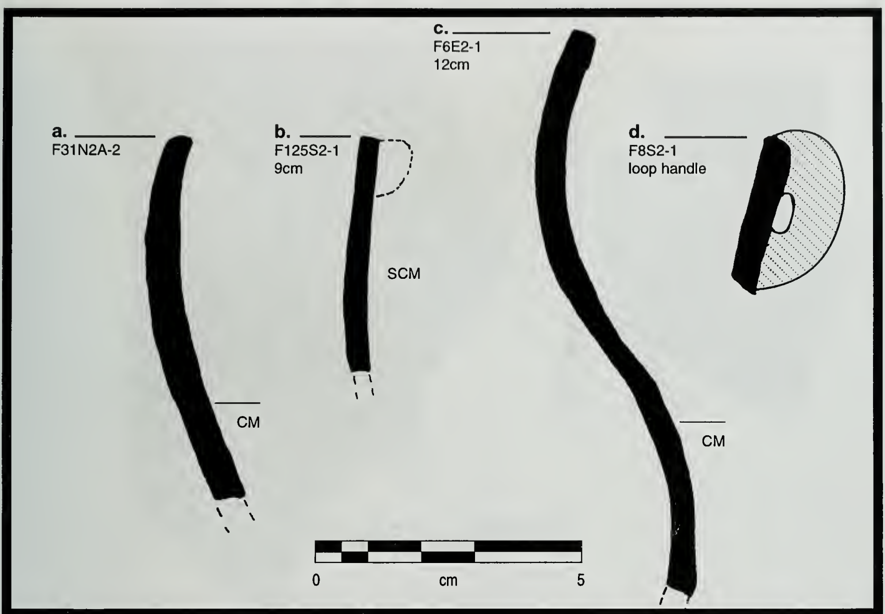

Figure 5-15. Representative Rim Profiles of Type 5 Jars.

senting only 3.2 percent of jars and 2.0 percent of identified vessels. Three sherds are grog tempered, two are limestone tempered, and one is shell tempered. Three of the rims are plain, two are red slipped, and one is plain and cordmarked. Four sherds have notched rims (Figure 5-16, a-b, Plate 5-6, b-c). The notches on two red-slipped rims are shallow and possibly made with a rounded stick while those on the plain rims are deeper and made with a rounded stick. The latter two rims resemble the Lindeman example illustrated for the Range site (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984:Plate 27, a). The low frequency of this type is not unexpected since everted-rim jars are more characteristic of later occupations in the American Bottom, especially beginning in the Mississippian period Lohmann phase (Milner et al. 1984:161). Three of the Type 6 rims appear to fit the type Powell Plain, and one rim the type Merrell Cordmarked as defined by Vogel (1975). The other rim resembles Merrell Cordmarked (Category S) but is limestone rather than grog tempered.

Rim thickness varies from 2.0 to 10.4 cm, with three possible clusters (2.0 to 2.4 mm, 5.0 to 5.4 mm, and 10.0 to 10.4 mm), although this may be the result of sample size (Figure 11, top). Orifice diameter could be determined for four rims: 10 cm, 16 cm, 19 cm, and 20 cm (Figure 12, top).

Angled-Rim Jars. Only one jar with an angled rim is present, comprising less than one percent of jars and

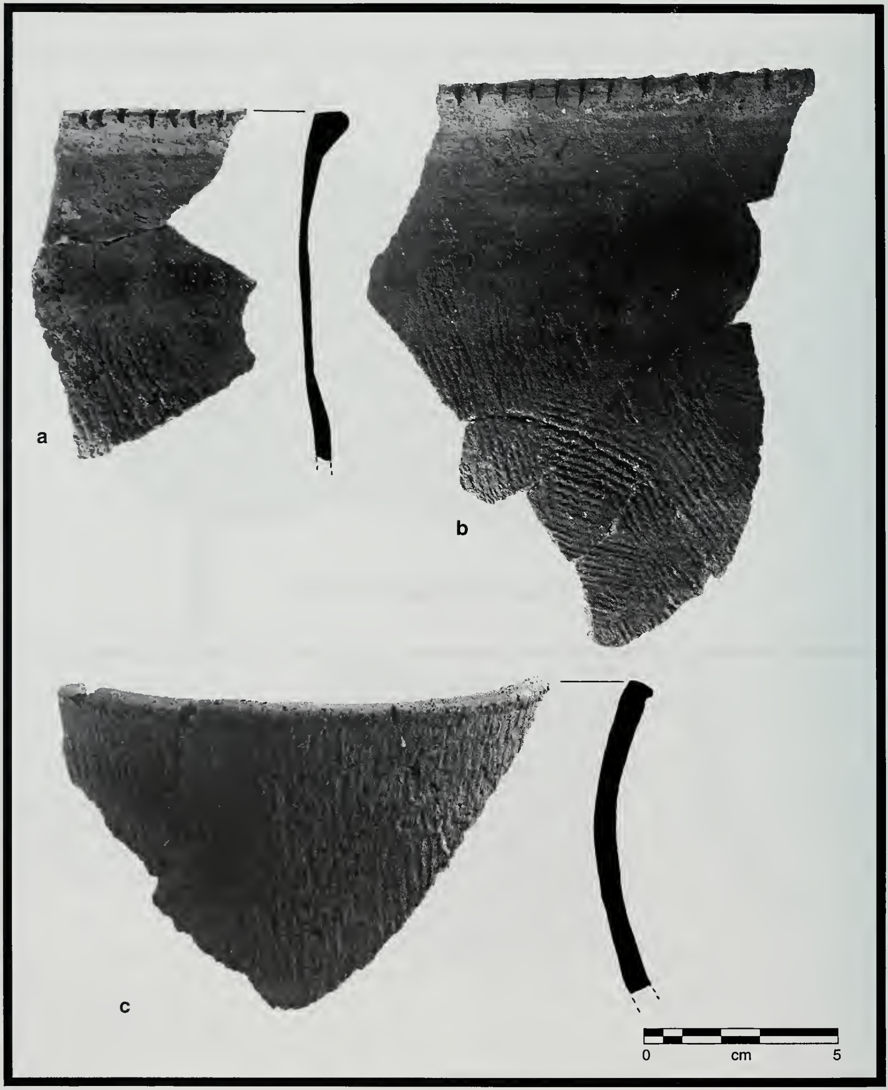

Plate 5-5. Representative Type 5 Jars.

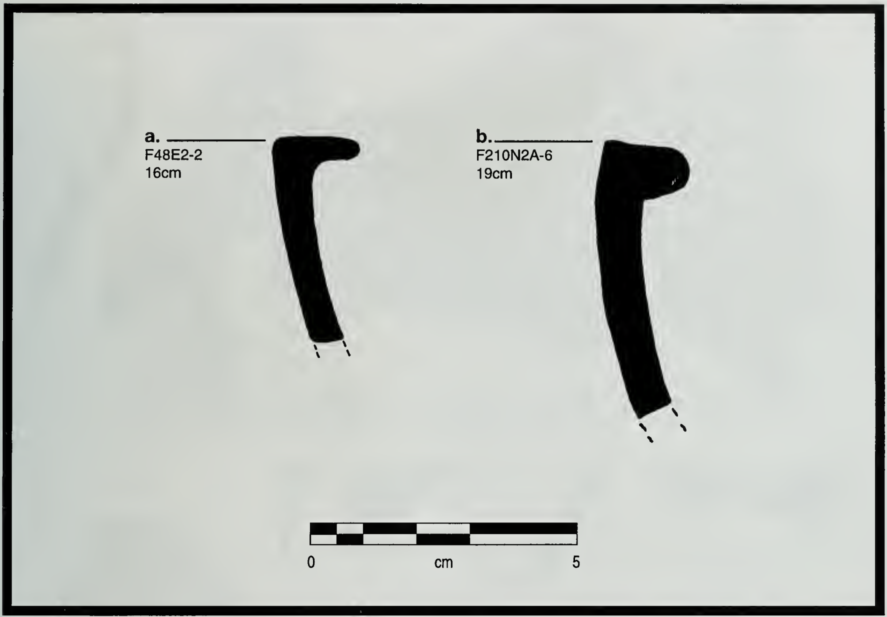

Figure 5-16. Representative Rim Profiles of Type 6 Jars.

all identified vessels (Plate 5-6, f). The rim is plain, tempered with shell and grit and is 4.5-cm thick (Figure 5-11, top). Orifice diameter could not be determined.

Summary. Most jars in the Stemler Bluff assemblage are limestone tempered (79 percent), which is typical of Emergent Mississippian and Mississippian ceramic assemblages in the southern American Bottom. No other temper is represented among the identified rims by more than seven sherds (Figure 5-17). Plain-necked forms are predominant (60 percent), although cordmarked vessels (35 percent) are not uncommon (Figure 5-18, top). The higher proportion of plain-necked forms at Stemler Bluff than in the Range phase at Range may be due to the fact that percentages here have not been calculated by phase as they were at Range. Conversely, it may indicate that more of the "Emergent Mississippian" features at Stemler Bluff actually date to the Lindeman phase or later rather than the Range phase. Unfortunately, few features at Stemler Bluff can be assigned to specific phases given the low number of rims in most features and lack of clearly diagnostic characteristics. However, the predominance of Type 3 and Type 4 jars suggests the bulk of the occupation occurred during the Range phase or later.

Decorative features are found on all but Type 1 jars and consist mainly of lugs and stick impressions (Figure 5-18, bottom). Contact with areas to the north and south appears to be limited. Only a few

Plate 5-6. Representative Type 6 and Angled Rim Jars.

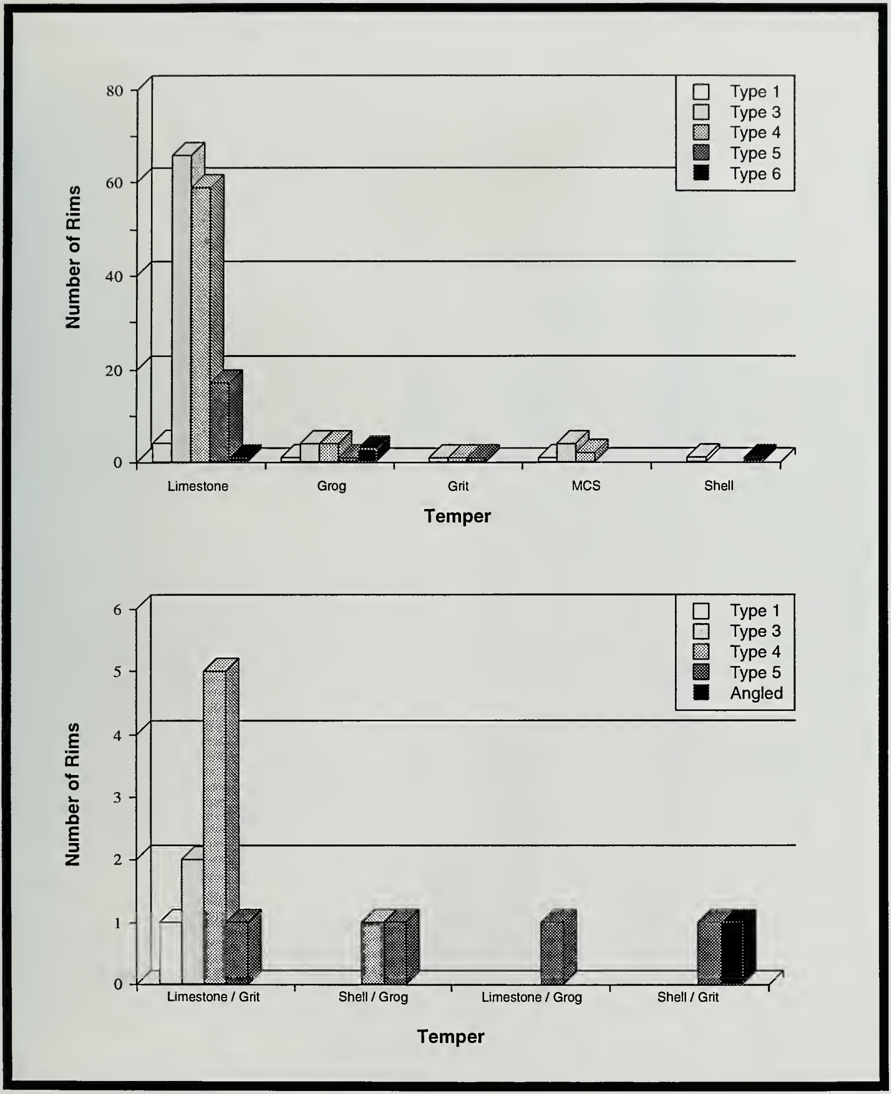

Figure 5-17. Frequency and Distribution of Temper Types for Jars.

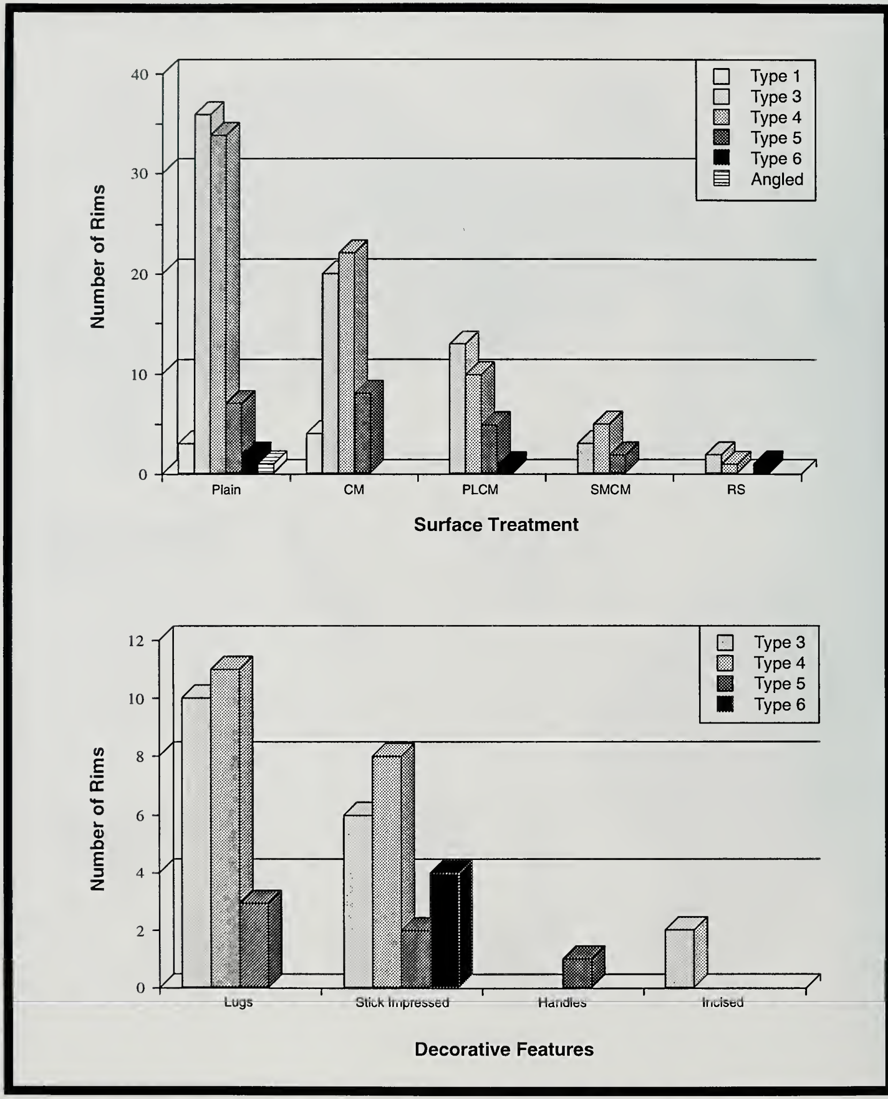

Figure 5-18. Frequency and Distribution of Surface Treatment and Decorative Features for Jars.

MCS, Monks Mounds Red, and Ramey Incised vessels were identified, perhaps suggesting that the inhabitants of this site had less interaction with groups in the northern American Bottom than did other Emergent Mississippian groups at southern floodplain sites such as Range and George Reeves. The one possible Dillinger Decorated sherd also suggests that there were few contacts to the south. As at Range, the grit-tempered MCS jars appear to be of the named type Peters Station Cordmarked (Vogel 1975). The lack of clear definitions for limestone-tempered types such as Pulcher Plain and Pulcher Cordmarked (Griffin 1977; see also Fortier 1996; Kelly et al. 1990) argues against assigning the Stemler Bluff limestone-tempered jar rims to a specific type, except where specific similarities have been noted. The cordmarked grog-tempered sherds could be examples of Kane Cordmarked vessels (Vogel 1975:110–112).

Surface treatment of the jars (Figure 5-19) is somewhat similar to that at the Marge site, with two notable exceptions. There are significantly more cordmarked jars at Stemler Bluff (29 percent of jars) than at Marge (6 percent of jars). Also, Stemler Bluff has very few red-slipped jars (2 percent of jars) compared to Marge (19 percent of all jars). The higher percentage of cordmarked jars at Stemler Bluff might indicate that fewer of the "Emergent Mississippian" features date to the Lindeman phase, exactly the opposite conclusion of the comparisons made to the Range assemblage.

Bowls

Bowls represent 35.0 percent (n=105) of the identified vessel forms from 11MO891. Three bowl types, corresponding with those defined for the Range site, are present. Two bowl forms dominate the assemblage.

Type 1. Type 1 bowls are characterized by inslanted, outcurved rims (Figure 5-20, Plate 5-7). Only eight rims of this type are present, representing 7.6 percent of all bowls and 2.7 percent of all vessels. Seven of the rims are cordmarked, and one is smoothed cordmarked. All of the rims are limestone tempered. One rim has diagonal cordwrapped-stick decoration on its superior surface (Figure 5-20). Rim thickness ranges from 3.0 to 7.9 mm, although seven of the eight rims are from 5.0 to 7.9 mm (Figure 5-21, top). Only one rim was large enough to estimate orifice diameter (Figure 5-21, bottom). At 46 cm, this is the largest measurable bowls.

Type 2. Type 2 bowls have vertical, outcurved rims (Figure 5-22, Plate 5-8). Forty rims have been identified in the assemblage. They represent 38.1 percent of bowls and 13.3 percent of all vessels. Most of the rims are cordmarked (n=33). Two rims are plain, two are smoothed cordmarked, one is red slipped, and one is red-slipped and cordmarked. Another rim is eroded. Limestone temper predominates (n=37), with grog (n=1), limestone and shell (n=1), and limestone and grit (n=1) tempers also present. One bowl has a thickened rim (Figure 5-22, a), and four have diagonal cordmarked decoration on their superior surfaces (Figure 5-22, b-e). Type 2 bowls range from 3.0 to 7.9 mm in thickness, with two possible clusters from 3.0 to 3.9 mm and 4.5 to 7.9 mm (Figure 5-21, top). Orifice diameter could be determined for only four rims (Figure 5-21, bottom), and its distribution may reflect sample size biases rather than clustering. The diameters range from 16 to 44 cm. One bowl is 6.7 cm in height.

Type 3. Type 3 bowls are characterized by outslanted, outcurved rims (Figure 5-23, Plate 5-9). This is the most common bowl type in the assemblage. In all, 57 rims are present, representing 54.3 percent of bowls and 19.0 of all identified vessels. As with Type 2 bowls, cordmarking is the predominant surface treatment (n=51). Three rims are red-slipped, two are plain, and one is plain and cordmarked. Fifty-one sherds are limestone tempered, three are tempered with limestone and grit, two with grog, and one with limestone and grog. One of these rims (Figure 5-23, a) is more accurately described as a pan.

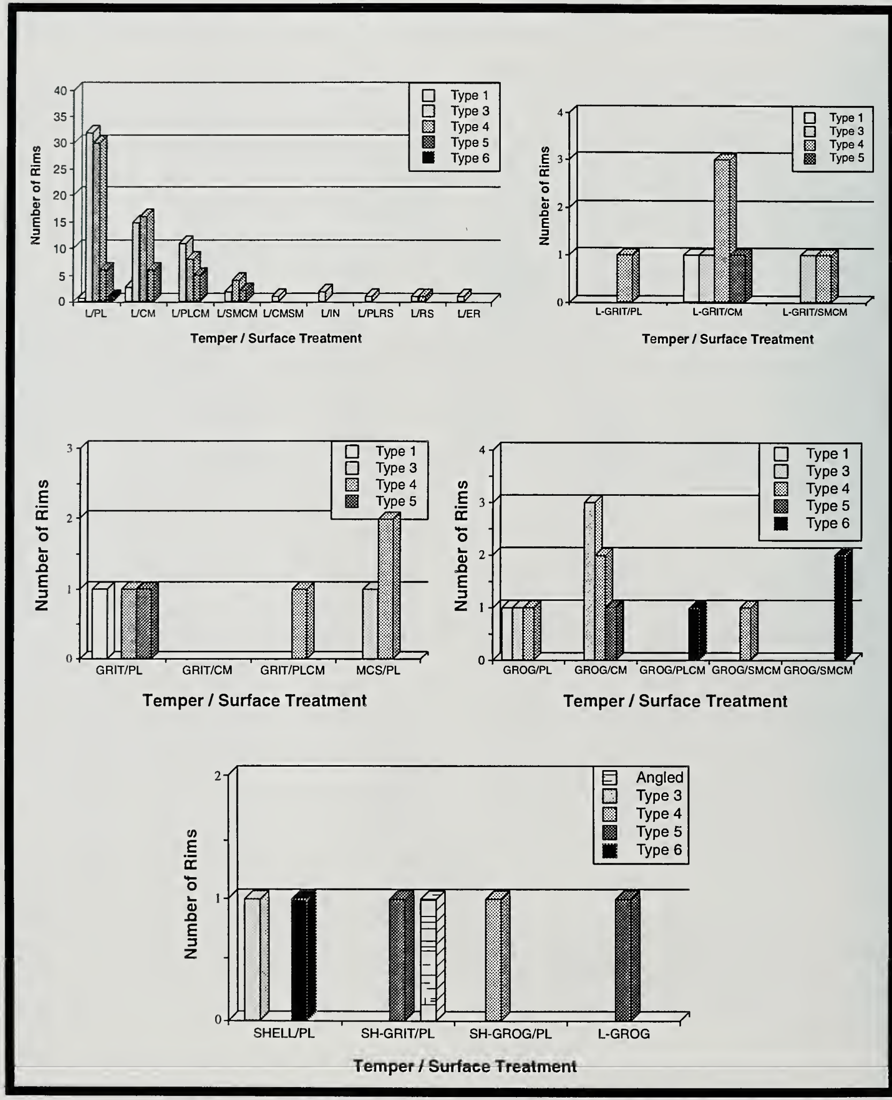

Figure 5-19. Frequency and Distribution of Temper and Surface Treatment by Jar Type.

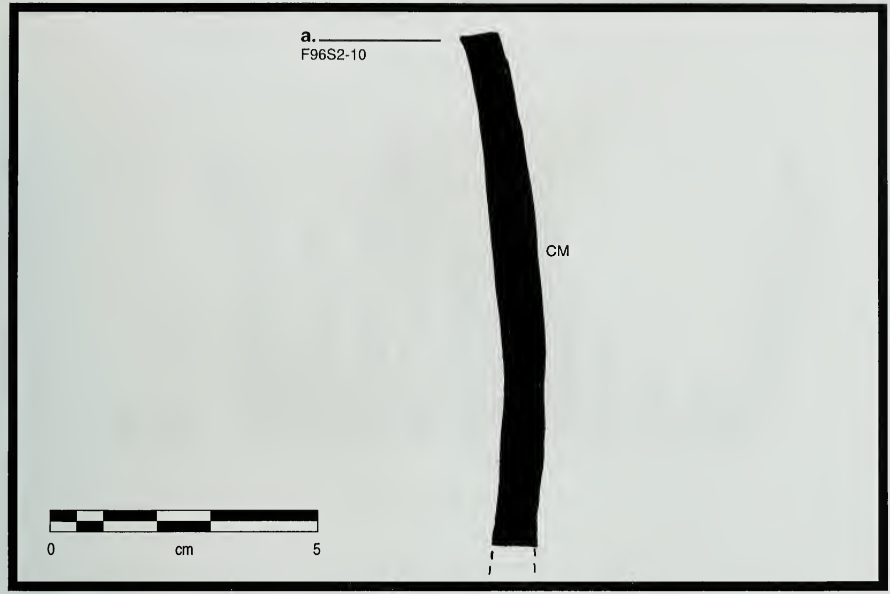

Figure 5-20. Representative Rim Profile of Type 1 Bowls.

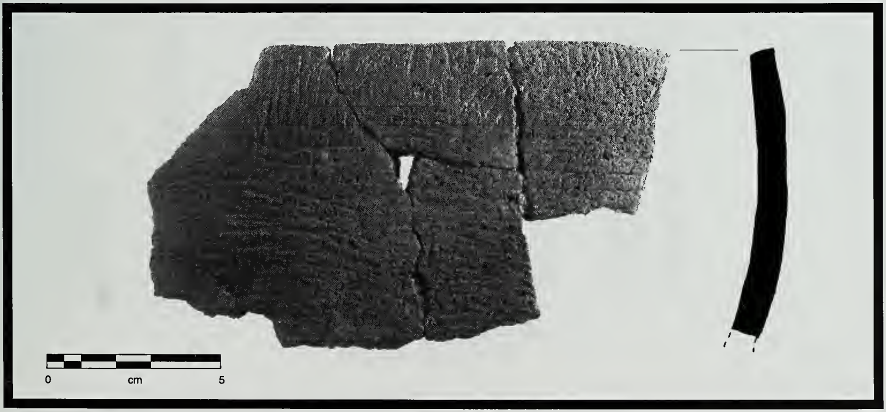

Plate 5-7. Representative Type 1 Bowl.

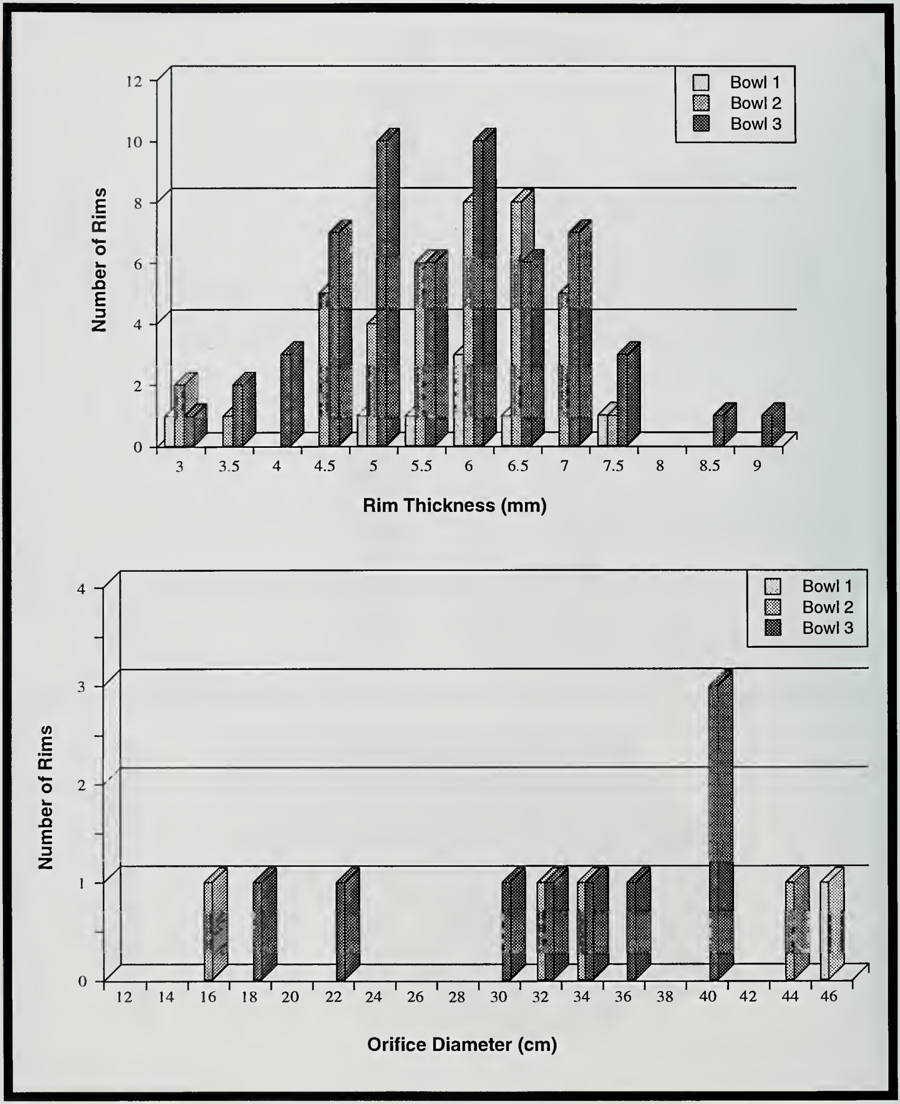

Figure 5-21. Frequency and Distribution of Rim Thickness (at top) and Orifice Diameter (at bottom) for Bowls.

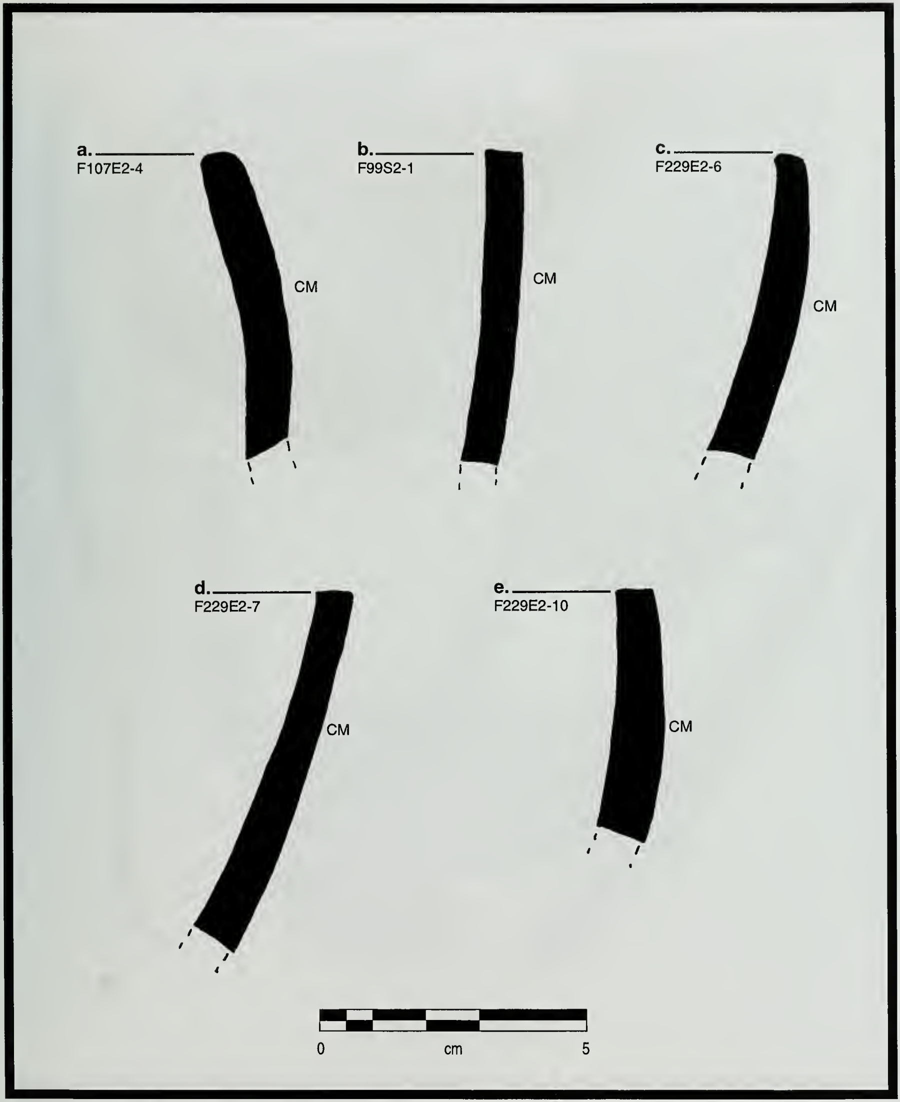

Figure 5-22. Representative Rim Profiles of Type 2 Bowls.

Plate 5-8. Representative Type 2 Bowls.

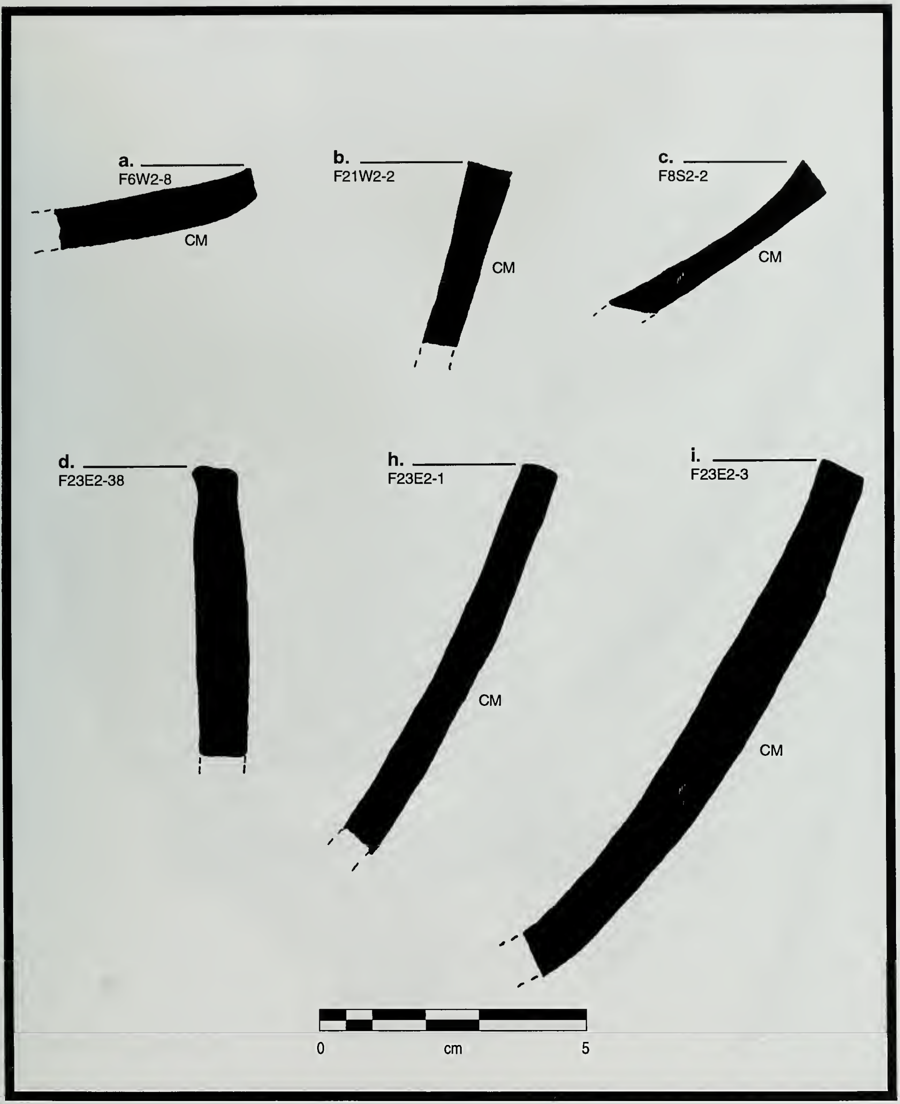

Figure 5-23. Representative Rim Profiles of Type 3 Bowls.

Plate 5-9. Representative Type 3 Bowls.

Plate 5-9. Concluded.

One sherd has discontinuous, diagonal rounded-stick decoration on its exterior (Figure 5-23, a), one has discontinuous, diagonal squared-stick decoration on its exterior (Figure 5-23, b), one has diagonal rounded-stick decoration on its superior surface (Figure 5-23, c), and one has diagonal cordmarking on its superior surface (Plate 5-9, b). Two rims from Feature 142 are red slipped and appear to be examples of the named type Monks Mound Red (Plate 5-9, c). One rim has diagonal cordwrapped-stick decoration on its superior surface (Figure 5-23, d). One bowl has a postfired drilled hole (Figure 5-23, e), and an incomplete attempt was made to drill a hole in another rim (Figure 5-23, f). On the incomplete hole, drilling was started on both the interior and exterior surfaces, but the holes do not go all the way through; even if they did, they would not match.

Type 3 bowls appear to show a normal distribution of rim thickness from 3.0 to 9.4 mm (Figure 5-21, top). Orifice diameters range from 18 to 40 cm, with possible clusters at 18 to 22 cm and 30 to 40 cm (Figure 5-21, bottom).

Summary. The majority of bowls in the Stemler Bluff assemblage are limestone tempered (91 percent), as is expected for an Emergent Mississippian assemblage in this region. No other temper is represented by more than four sherds (Figure 5-24, top). Cordmarked bowls dominate the assemblage (91 percent); only 8 percent are plain or red-slipped over a smooth surface (Figure 5-24, middle). The relative proportion of bowl types varies significantly from that of the Range phase bowls at the Range site, again possibly due to the aggregation of features here as opposed to Range or to geographical or cultural variation during the Emergent Mississippian period.

Only ten bowls have stick-marked decoration on their superior or exterior rim surfaces (Figure 5-24, bottom), suggesting that most of the occupation at Stemler Bluff postdates the Dohack phase. As with jars, the bowls show little evidence of interaction or contact with other areas. Only two rims from Type 3 bowls appear to be of the named type Monks Mound Red. Although the cordmarked limestone-tempered bowls could be called Pulcher Cordmarked (Griffin 1977), they are not assigned to a specific type given the lack of clear definitions discussed above. Similarly, the plain bowls could be examples of Pulcher Plain or Loyd (Korando) Plain (Fortier 1996). The three cordmarked grog-tempered rims might correspond to Kane (or Korando) Cordmarked (Vogel 1975).

Cordmarked bowls are more common in the Stemler Bluff than Marge assemblage (Figure 5-25). At Stemler Bluff, cordmarked examples comprise 87 percent of the bowl assemblage in contrast to 42 percent of the Marge bowls. Red-slipped bowls also are far less common at Stemler Bluff, forming only 1 percent of the bowl assemblage in contrast to 30 percent at Marge. The proportion of bowl types also varies significantly from that of the Range phase at Range. Although Type 1 bowls are uncommon in both assemblages, they are more prevalent at Stemler Bluff. The proportion of Type 2 bowls also is higher at Stemler Bluff, comprising 38 percent of bowls in contrast to 14 percent at Range. Not surprisingly, then, Type 3 bowls are less common at Stemler Bluff (54 percent of bowls) than at Range (83 percent of bowls). In fact, the percentages of bowl types at Stemler Bluff are more like those of the Dohack phase at Range where Type 1 bowls comprise 8 percent of the bowls, Type 2 bowls represent 24 percent of the assemblage, and Type 3 bowls make up the remaining 68 percent.

Pinch Pots

Pinch pots make up only 3.3 percent (n=10) of the identified vessel forms. Both bowl and jar forms are present (Plate 5-10). Nine of the rims are plain, and one is smoothed cordmarked. Grog temper is most common (n=5), followed by grit (n=2), limestone (n=1), shell (n=1), and no temper (n=1). None of the pinch pots is decorated. The shell-tempered example (Plate 5-10, d) is irregularly shaped and could, alternatively, be the "hood" from a hooded

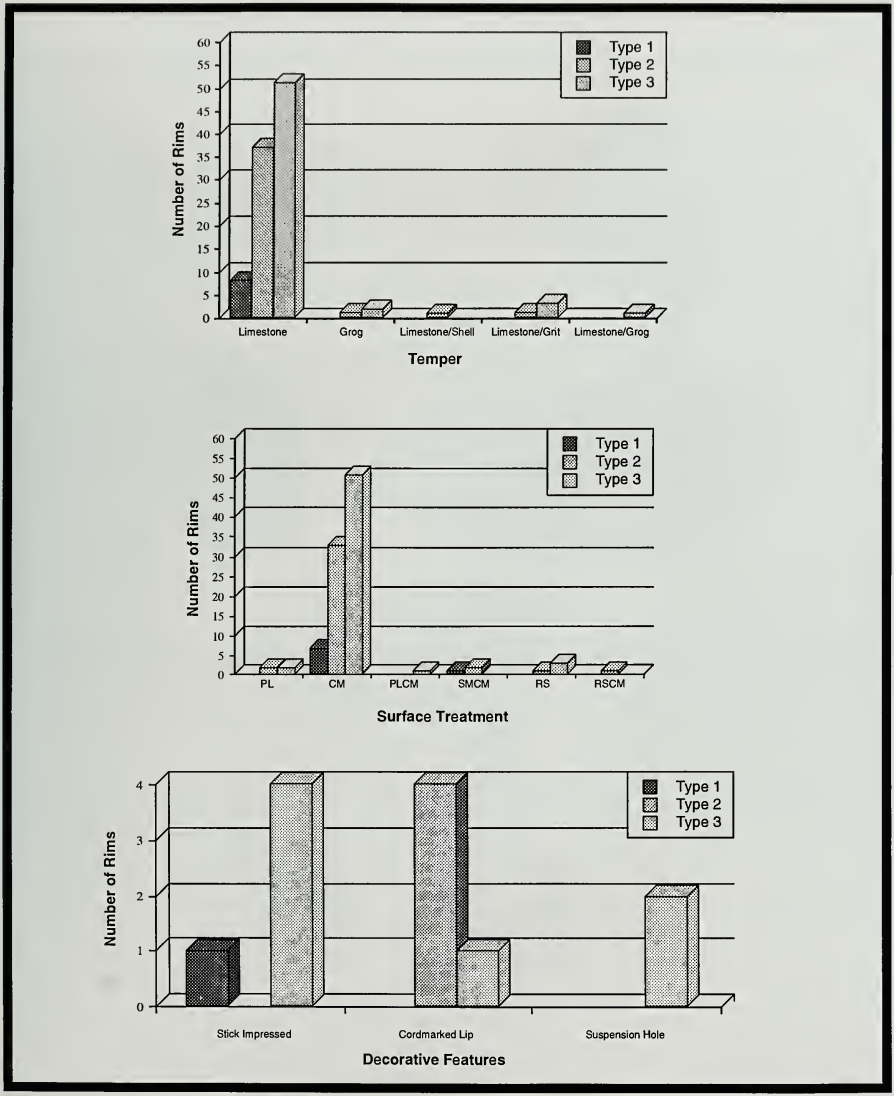

Figure 5-24. Frequency and Distribution of Temper Type (at top), Surface Treatment (middle), and Decorative Features (at bottom) for Bowls.

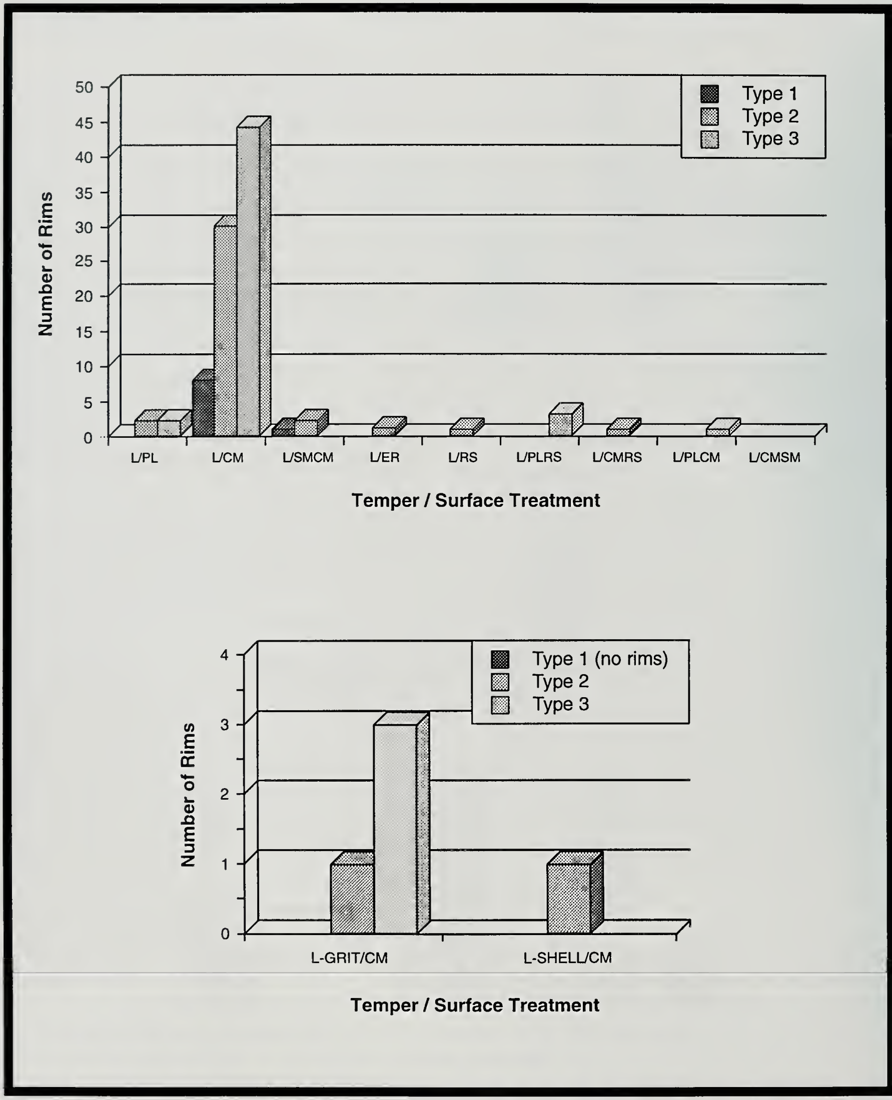

Figure 5-25. Frequency and Distribution of Temper and Surface Treatment by Bowl Type.

Plate 5-10. Representative Pinch Pots.

water bottle. This example is from Feature 79, which appears to date to the Lindeman phase. The exact function of these vessels is unknown. It has been suggested that they represent children's toys, test vessels for ceramic manufacture, scoops, or drinking vessels (Fortier et al. 1983).

Other Ceramic Objects

Several other ceramic objects were recovered from the features at 11MO891, including sherd disks, discoidals, a sieve, a pipe fragment, possible effigies and figurines, a spindle whorl, and an unidentified object. Such objects have been found at other Emergent Mississippian sites in the American Bottom (e.g., Fortier 1996; Holley 1989; Kelly et al. 1990).

Sherd Disks

In all, seven sherd disks were recovered from six features (Plate 5-11). One disk (Plate 5-11, a), measuring 20.4 mm in diameter and 5.0 mm in thickness, is ground. This disk is made from a plain, limestone-tempered sherd. The other six disks are unground. One is made from a cordmarked MCS sherd with a diameter of 38.2 mm and thickness of 9.7 mm (Plate 5-11, b). Two, both from Feature 77, are tempered with grit and grog and are smoothed cordmarked and red slipped (Plate 5-11, c-d). One is 39.7 mm in diameter and 8.0 mm thick. The other

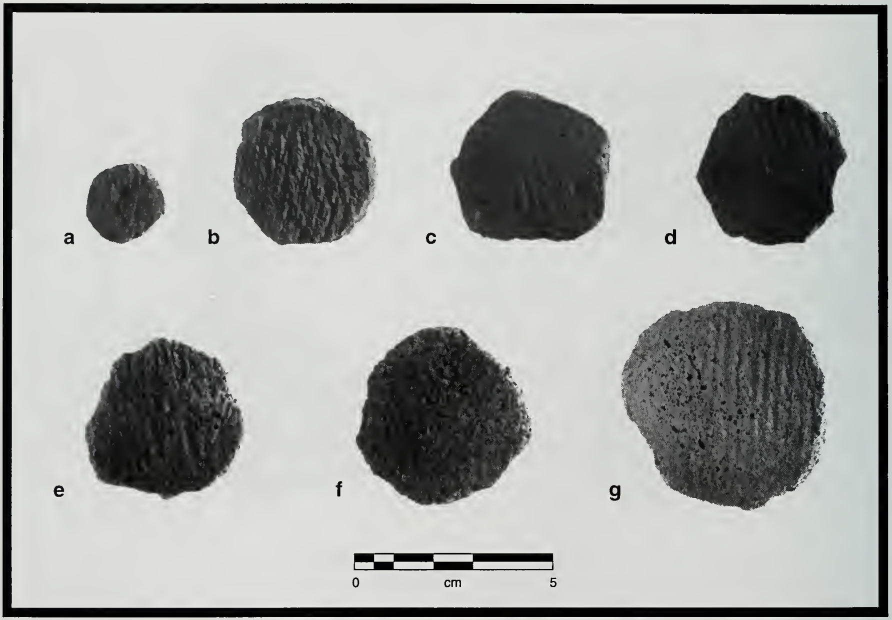

Plate 5-11. Sherd Disks.

is 39.6 mm in diameter and 6.6 mm thick. The final three unground disks are cordmarked and limestone tempered. One is 40.5 mm in diameter and 6.4 mm thick (Plate 5-11, e). Another has a diameter of 44.5 mm and thickness of 9.1 mm (Plate 5-11, f). The final specimen is 52.9 mm in diameter and 10.0 mm thick (Plate 5-11, g). The function of these artifacts is unknown.

Discoidals

Two discoidals were found in two features (Plate 5-12). One has a maximum diameter of 35.8 mm and maximum thickness of 14.1 mm (Plate 5-12, a). The other is 53.3 mm in diameter and 20.8 mm thick (Plate 5-12, b). Kelly et al. (1990) previously have assigned such artifacts to the typology devised by Perino (1971a) for stone discoidals. Both pieces recovered from 11MO891 fit the Bradley variety. The actual function of these artifacts is unknown.

Sieve

One possible sieve was present in Feature 79 (Plate 5-13). It is made from a limestone-tempered, cordmarked sherd. The piece measures approximately 89.5 mm in diameter and is maximally 11.3 mm thick. The edges have been ground. Five complete and three broken holes are present. Incomplete drilling for another hole is evident on both sides of the piece. It resembles a shell-tempered drilled-hole disc from a Moorehead phase feature from the

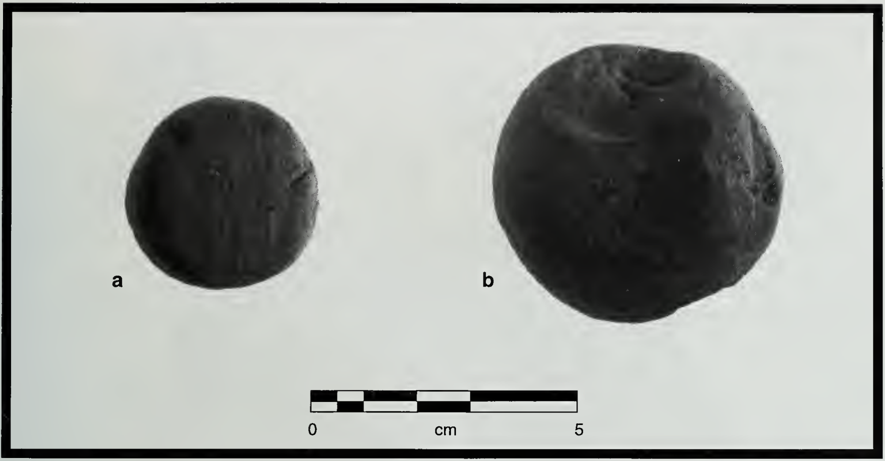

Plate 5-12. Ceramic Discoidals.

Plate 5-13. Possible Sieve.

Interpretive Center Tract-II at Cahokia (Holley 1984:Figure 59, a).

Pipe

One ceramic pipe fragment was found in Feature 110 (Plate 5-14, a). It consists of the bowl and base of the stem. A few pieces of grit are visible in the paste, but they appear to be incidental inclusions rather than true temper. The hole is off center and measures approximately 1.6 mm in diameter. No decoration is present.

Effigy

One possible effigy was recovered from Feature 139 (Plate 5-14, b). The piece is small, and the intended form is not clear. It could simply be an oddly shaped piece of burned clay.

Figurines

Two possible figurines were found in Feature 89 (Plate 5-14, c-d). Both items are rather shapeless. One is somewhat flat and oblong, and the other is more irregular. The actual function of these artifacts is unknown, and, like the possible effigy, they could be simply pieces of burned clay.

Spindle Whorl

One possible spindle whorl was recovered from Feature 155 (Plate 5-14, e). It is made from a limestone-tempered, cordmarked sherd. The sherd is 11.5 cm in diameter, and the drilled center hole is 1 cm in diameter.

Unidentified

One unidentified object was recovered from Feature 166 (Plate 5-14, f). The item has the shape of one-half of a hollow sphere. It is approximately 1.5 cm thick and 5.5 cm in diameter. It may have been some type of potter's or other tool.

Mud Dauber Nests

Three fragments of mud dauber nests were recovered from Features 1, 137B, and 170. It has been suggested that they may be useful as seasonal indicators (Freimuth and LaBerge 1976; Rogers 1979) or that they were a food resource (Maxwell 1951; Wedel 1961; Wilson 1979). The fragments were recovered from a bell-shaped pit and medium and deep basins. Too few were recovered to make meaningful inferences regarding their presence.

Mortuary Area Ceramics

Of the 51 features in the mortuary area, only ten contained any sherds, sherdlettes, or burned clay (Figure 5-26). Most do not appear to be grave goods since the ceramics are all small body sherds. The only possible grave good is a large fragment of a smoothed-cordmarked limestone-tempered vessel that was found above the teeth of the individual in Feature 253. The others are probably incidental inclusions in feature fill. Features 253, 216, 241, and 243 contain the most material, with 26, 22, 13, and 13 items, respectively. No rims are present to allow determination of vessel form. Twenty-six of the sherds and sherdlettes are limestone tempered, four are grog tempered, and five are tempered with both limestone and grog. Seven are plain, 22 are cordmarked, one is smoothed cordmarked, and five are eroded. In addition to these sherds, there are 48 sherdlettes and seven pieces of burned clay. None of the material is distinct enough to assign the features to specific Emergent Mississippian or Mississippian phases. The material does fit the time range suggested by the radiocarbon date of 970±60 B.P. from Feature 203. Given the lack of data on Emergent Mississippian mortuary practices in the American Bottom, this absence of associated grave goods may be, in fact, representative.

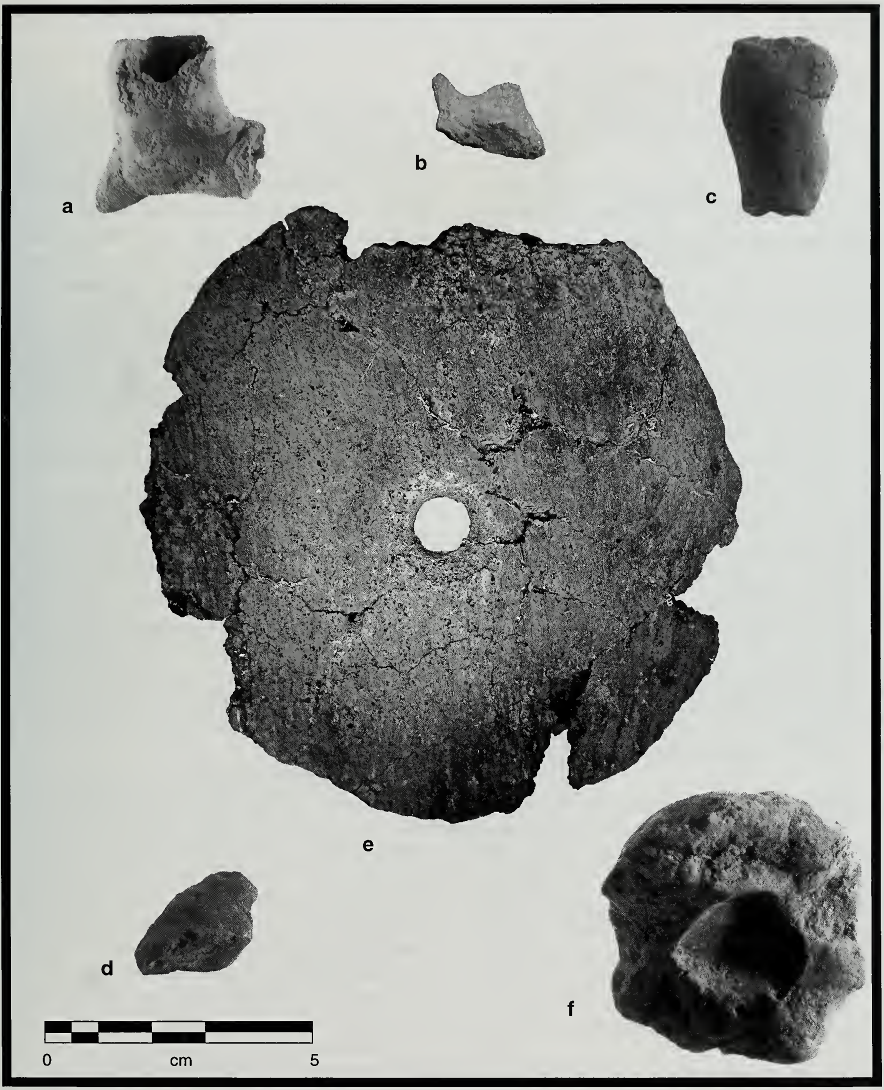

Plate 5-14. Miscellaneous Artifacts: a, Pipebowl; b, Possible Effigy; c-d, Possible Figurine Fragments; e, Spindle Whorl; f, Unidentified.

Figure 5-26. Mortuary Features Containing Sherds, Sherdlettes, Daub and Burned Clay.

Interpretations

Analysis of the ceramics from 11MO891 identified several features that could be assigned to a specific phase, most of which are identified as late Emergent Mississippian or Mississippian. The majority of the features cannot be assigned to a single phase because they either do not contain a large enough sample of identifiable sherds or because they contain sherds that may be characteristic of more than one phase or period. In the following section, the results of the analysis are used to examine the distribution of vessels across all feature and structure types. They are also used to determine the chronology of occupation at the Stemler Bluff site.

Vessel Distribution Across Features

A comparison of vessel distribution across features was made to determine whether any discernable temporal or functional patterns exist in the ceramic assemblage. Given that most features had an MNV of one or two and no more than two identifiable rims, it appears that the vessel forms are distributed randomly across feature types. This supports the interpretation presented in Chapter 4 that the presence of most artifacts in the features is the result of secondary deposition.

Jars. As at other Emergent Mississippian sites in the American Bottom, the most common vessel type is the jar. The predominance of Type 3 and Type 4 jars is similar to that at other Emergent Mississippian sites such as Range and George Reeves. The low incidence of Type 1 jars and absence of Type 2 jars is, therefore, to be expected. Type 1 jars are known only from six features consisting of two single-post-and-basin structures, two bell-shaped pits, one shallow basin, one medium basin, and one deep basin (Figure 5-27). These features either contain other jar forms representative of the Emergent Mississippian or Mississippian periods (Features 5, 79, 82, 107) or a predominance of rim and body sherds typically associated with those periods (Features 40, 88). These Type 1 jars may be the remains of an earlier Late Woodland occupation in the area that have been incorporated into the feature fill, or they may indicate that this type was manufactured longer in the uplands than in the American Bottom floodplain.

Type 3 and Type 4 jars were recovered from all types of features across the site (Figure 5-28). Type 3 jars were recovered from eight single-post-and-basin structures, 16 bell-shaped pits, four shallow basins, five medium basins, and two deep basins. Type 4 jars were identified in eight single-post-and-basin structures, 12 bell-shaped pits, 13 shallow basins, three medium basins, one deep basin, and one "other" class feature. These two jar forms are the most numerous at Stemler Bluff and occur in nearly equal numbers (77 Type 3 jars and 72 Type 4 jars). It also may be argued that their distribution is random; 19 features contained Type 3 jars but no Type 4 jars, 17 features had Type 4 jars but no Type 3 jars, and 18 features contained both forms. Although it was suggested above that the percentages of these two jar forms might indicate a Range (or Lindeman) or later occupation, the fact that only 9 of the 37 features with Type 3 jars and 9 of the 40 features with Type 4 jars contained between three and nine of these rims indicates these percentages may be meaningless. The remaining 28 features with Type 3 jars and 32 features with Type 4 jars contained only one or two rims of these types.

Type 5 jars are less common but are still found across the site (Figure 5-29), representing 11.9 percent of identified jars. They were recovered from 18 features at Stemler Bluff including one wall-trench structure, four single-post-and-basin structures, five bell-shaped pits, four shallow basins, two medium basins, and two deep basins. Thirteen of these features also contained Type 3 and Type 4 jars. One feature also included an angled-rim jar. Four features contained no other identifiable jar forms.

Type 6 and angled-rim jars comprise only about three percent of the jar assemblage (Figure 5-30). These forms are characteristic of later Mississippian

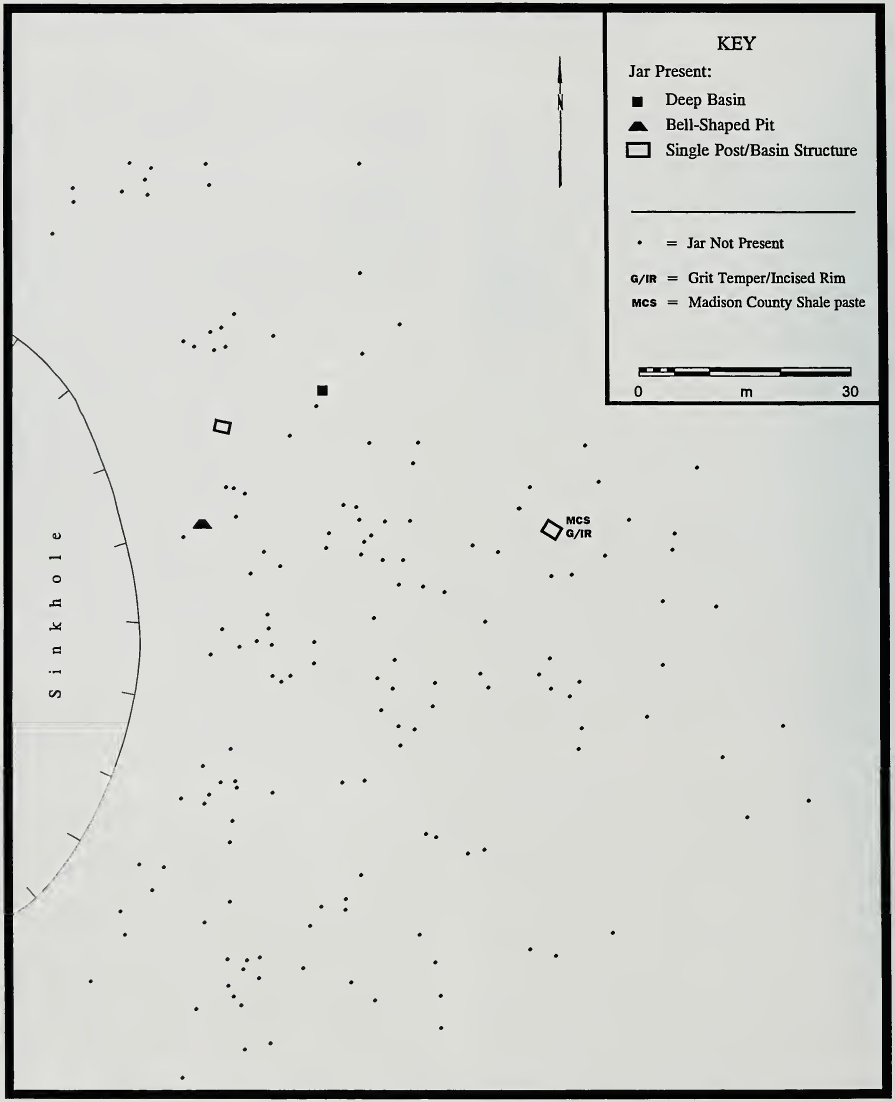

Figure 5-27. Distribution of Type 1 Jars Across Features.

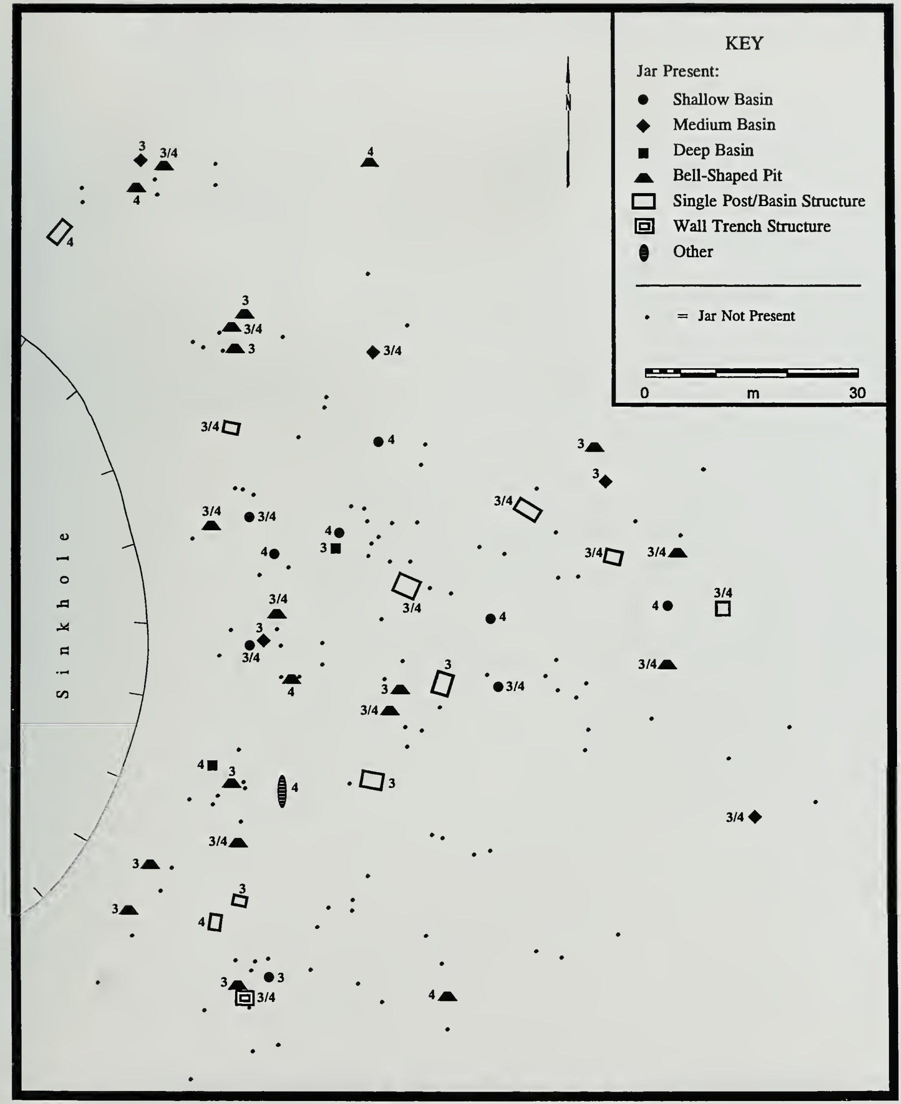

Figure 5-28. Distribution of Type 3 and Type 4 Jars Across Features.

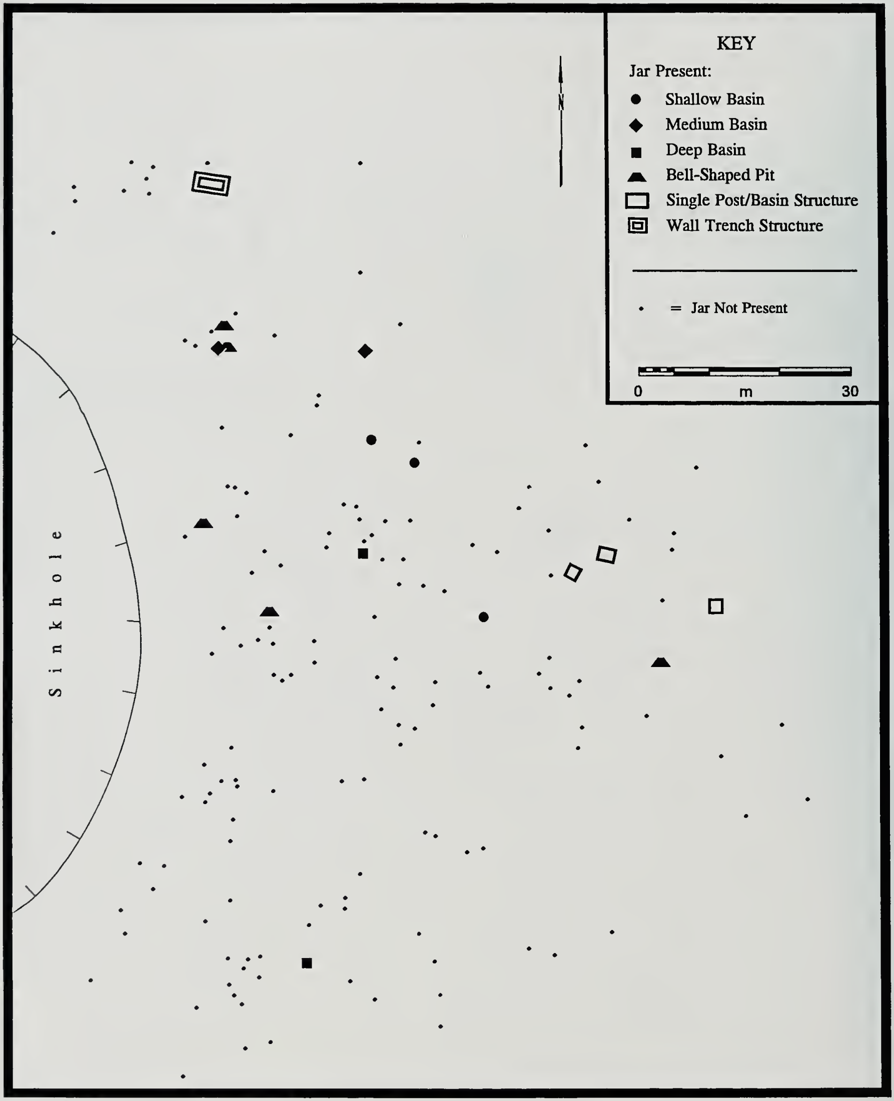

Figure 5-29. Distribution of Type 5 Jars Across Features.

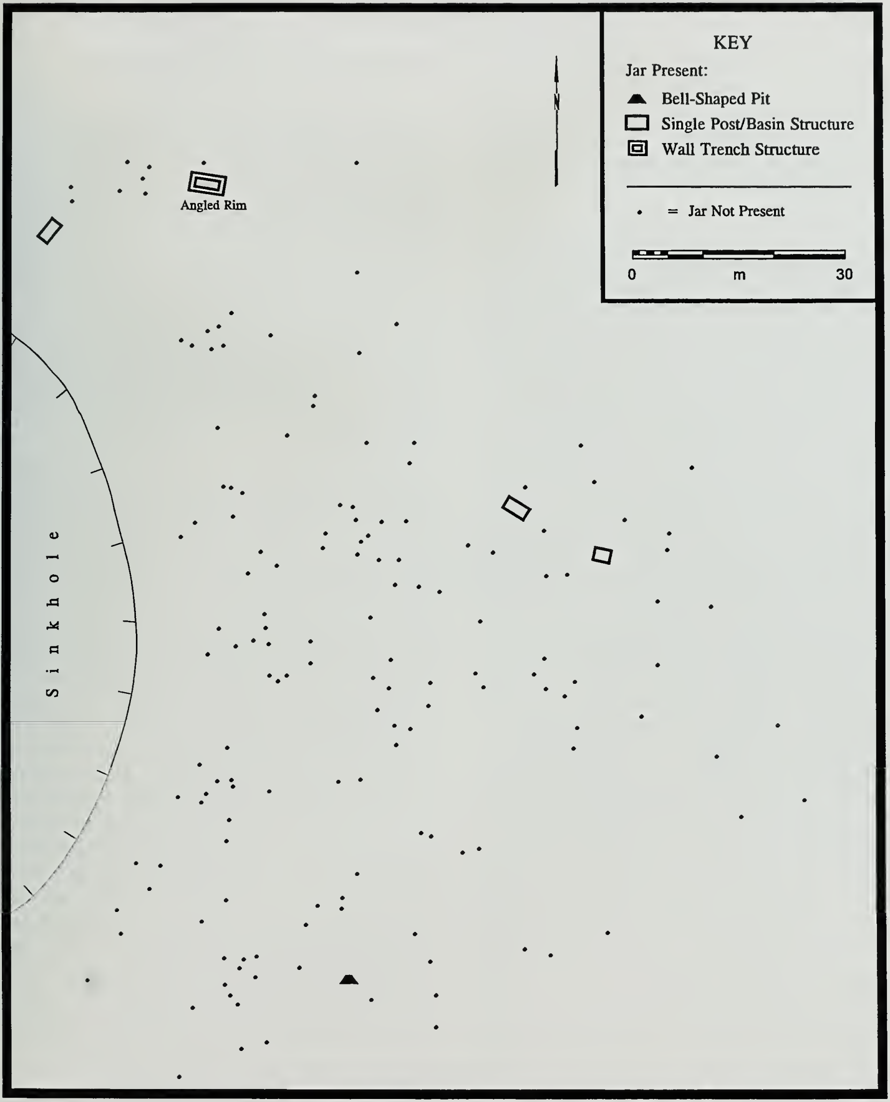

Figure 5-30. Distribution of Type 6 and Angled Rim Jars Across Features.

phases rather than the Emergent Mississippian period, and the features from which they were recovered, three single-post-and-basin structures and two bell-shaped pits, have been assigned to Mississippian phases. The angled rim jar was found in a wall-trench structure.

Bowls. As at other Emergent Mississippian sites in the American Bottom, bowls make up less than one-half of the ceramic assemblage at the Stemler Bluff site. The predominance of Type 2 and Type 3 bowls is typical, as is the low proportion of Type 1 bowls, which are generally associated with the Late Woodland period (Figures 5-31, 5-32, and 5-33). Type 1 bowls comprise only 8.6 of the bowl assemblage, a figure that compares fairly well with that for the Range phase at the Range site (3 percent). Type 1 bowls were recovered from one wall-trench structure, two single-post-and-basin structures, four bell-shaped pits, and one shallow basin. Type 2 bowls are significantly more prevalent at Stemler Bluff (38.1 percent) than at Range (14 percent) and were recovered from three single-post-and-basin structures, four bell-shaped pits, eight shallow basins, three medium basins, one "other" class feature, and from one nonfeature context. Given the higher percentage of Type 1 and Type 2 bowls at Stemler Bluff, Type 3 bowls (53.3 percent) comprise, not surprisingly, less of the bowl assemblage than they do at Range (83 percent). Type 3 bowls were recovered in 26 features consisting of one wall-trench structure, six single-post-and-basin structures, 11 bell-shaped pits, two shallow basins, three medium basins, two deep basins, and one "other" class feature. Sample size, degree of phase variation, or cultural differences all could account for the difference, although sample size is the most likely reason. Only eight features contain Type 1 bowls, and of these, seven contain only one rim of this type. Of the 20 features that contain Type 2 bowls, only six contain three to five rims of this type. The remaining 14 features contain only one or two rims of this type. Only six features with Type 3 bowls contain between three and ten rims; 20 contain only one or two rims.

Vessel Distribution Across Structure Types

Analysis of identifiable vessels was conducted for each structure to determine whether temporal or functional characteristics could be identified. Several structures contain no identifiable vessel forms, and none have a large enough sample to obtain statistically valid results. Feature 23, a single-post-and-basin structure, contains the most identifiable rims (n=25), but all other structures contain fewer than ten. The lack of a statistically valid sample precludes determining temporal affiliation on the basis of percentages of vessel forms. However, the presence of certain ceramic attributes as well as radiocarbon dates does allow temporal classification of most structures.

Single-Post-and-Basin Structures. Twenty-two single-post-and-basin structures were identified at the Stemler Bluff site. These features are distributed across the site, with few readily discernable patterns (see discussion in Chapter 4). Four features (23, 159, 221, and 222) have been radiocarbon dated; the ceramics from these features do not contradict the radiocarbon assays for the most part. The identifiable rims from Feature 23, which is dated at 1110±50 B.P., are mainly limestone tempered and consist primarily of Type 3 and Type 4 jars and Type 2 bowls. The calibration for this date (Table 4-2) spans the period of time defined for the Range to Lindhorst phases. Three shell-tempered sherds also were recovered, at least one of which is from the surface. One rim is decorated with a square stick, and another has a round lug and has been decorated with a cordwrapped stick. One other rim has a round lug. Eleven jar rims are plain, two are plain and cordmarked, and one is cordmarked. Except for the shell-tempered sherds, the assemblage appears to be similar to the Range phase assemblage at Range. If the three shell-tempered sherds are not intrusive, Feature 23 might date to the George Reeves or Lindeman phase. In that case, the rims with stick decoration may indicate that such decorative techniques were still used at Stemler Bluff after they had been discontinued elsewhere in the American Bot-

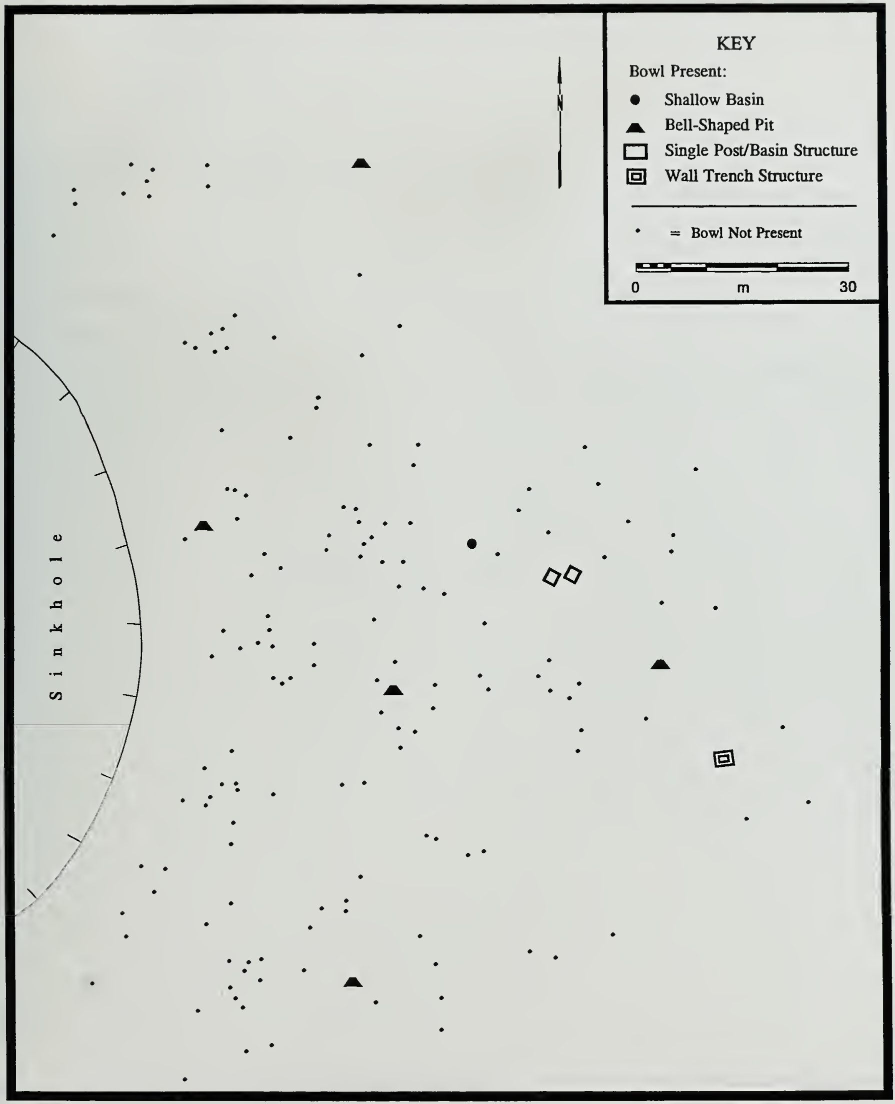

Figure 5-31. Distribution of Type 1 Bowls Across Features.

Figure 5-32. Distribution of Type 2 Bowls Across Features.

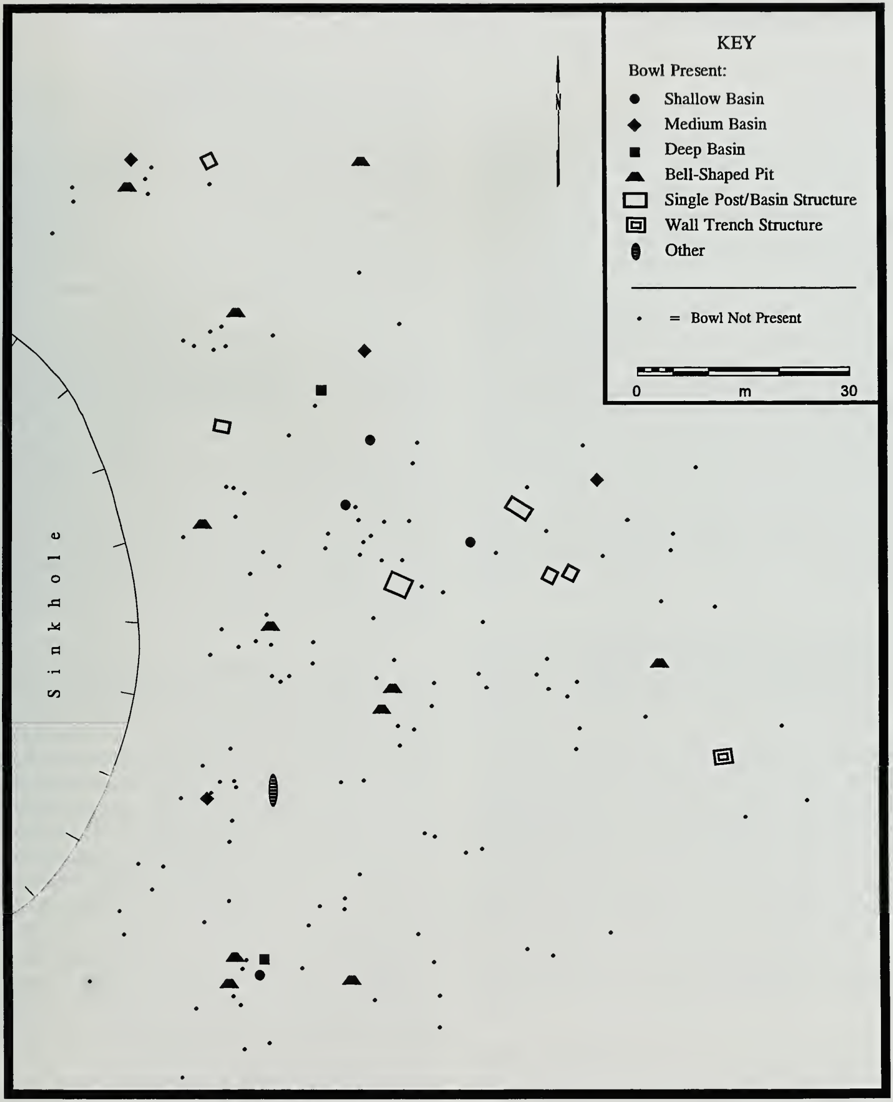

Figure 5-33. Distribution of Type 3 Bowls Across Features.

tom or that these rims are incidental fill from earlier occupations.

Feature 159 has a radiocarbon date of 930±60 B.P., which, when calibrated falls in the Mississippian Lindhorst (Lohmann) through Moorehead phases. It contains one plain limestone-tempered Type 4 jar and two grog-tempered Type 6 jars, one of which is plain and the other is plain and cordmarked. Four shell-tempered sherds are also present in the assemblage. Type 6 (everted rim) jars first appear in significant numbers in the Lindhorst (Lohmann) phase, although Kelly et al. (1990) report one example from the Dohack phase at Range. No everted rim jars are reported for the Range phase at that site. This feature may date to the Lohmann (Lindhorst) phase but more conservatively can be characterized as Lindeman phase or later in age. The Type 6 jar rim from this feature does not have the "hyperangular" shoulder described by Milner (1983a) for Lohmann phase vessels from Turner and DeMange.

A radiocarbon date of 940±70 B.P. has been obtained for Feature 221. Calibrated, this date spans the Lindeman through Moorehead phases. Identified vessels from this feature include three limestone-tempered Type 3 jars (plain, plain and cordmarked, incised), one plain limestone-tempered Type 4 jar, two red-slipped grog-tempered Type 6 jars, and two Type 3 bowls. One eroded shell-tempered sherd is also present. One jar has a triangular lug, and one rim is decorated with a pointed stick. The two red-slipped rims have notches similar to a Lindeman phase example from Range (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984:Plate 27, a). These rims, as well as the others and shell-tempered sherd, are consistent with the radiocarbon date and fit the Lindeman phase ceramic characteristics.

Feature 222 has a radiocarbon date of 760±70 B.P., which, when calibrated, has two possible date ranges that span the Moorehead and Sand Prairie phases. Only one identifiable vessel is present, a plain grog-tempered pinch pot. The ceramic assemblage includes three grit-tempered MCS body sherds and one red-slipped limestone-tempered body sherd. Most of the assemblage is limestone tempered. Vessels with MCS paste first appeared in the southern American Bottom during the Dohack phase but become more common in the Range phase. They are not present in Mississippian period ceramic assemblages. The ceramics from this feature indicate that it probably dates to the George Reeves or Lindeman phase, contrasting sharply with the radiocarbon date.

In addition to the radiocarbon-dated features, 11 other single-post-and-basin structures can be assigned tentative temporal designations. Feature 269 contained only grog-tempered sherds. A random sample of cordmarked sherds was found to contain only S-twist cordmarks when the twists could be determined. This house is assigned to the Late Woodland Patrick phase on this basis. Recovered from Feature 40 were one Type 1 jar that is cordmarked to the rim and one incised grit-tempered small jar. This feature is tentatively assigned to the Dohack phase.

Feature 48 contains eight plain limestone-tempered jars (four Type 3, two Type 4, one Type 5, and one Type 6). One rim has a bilobed lug, another is decorated with a pointed stick, and the Type 6 jar has an everted rim with rounded-stick notches that resemble those from a Lindeman phase example from the Range site (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984:Plate 27, a). Two shell-tempered body sherds are also present in the assemblage. The feature is assigned to the Lindeman phase given the notched rim and the predominance of plain-necked rims. Feature 107 contains rims that are mainly limestone tempered, including one Type 1 jar, three Type 3 jars, two Type 4 jars, two Type 2 bowls, and one Type 3 bowl. One jar rim has been decorated with a rounded stick and resembles the Lindeman phase example illustrated from the Range site that has been described earlier. Another jar has been decorated with a pointed stick. This feature also is tentatively assigned to the Lindeman phase. Feature 10/157 contains 14 shell-tempered body sherds, 16 shell/limestone-tempered sherds, and one shell/grog-tempered sherd in addition to the one identifiable rim: a cordmarked grog/limestone-tempered Type 3 bowl. Given that shell temper is rare in the George Reeves phase, even at the much larger Range site, this feature probably dates to the Lindeman phase.

Two single-post-and-basin features appear to date to the Range phase or later. Feature 90 includes ninety MCS grit-tempered sherds, five Type 3 jars, two Type 4 jars, and two Type 5 jars. The jar necks are both cordmarked and plain and cordmarked. The ceramics from Feature 119 include four Type 3 jars with plain necks.

Four single-post-and-basin features probably date to the George Reeves phase or later. One red-slipped limestone-tempered body sherd was recovered from Feature 38. Feature 87 includes 28 shell/grog-tempered sherds. Feature 128 has three red-slipped limestone-tempered sherds, and Feature 178 has one red-slipped limestone-tempered sherd.

The remaining seven single-post-and-basin structures (Features 15, 42, 83, 141, 174, 177, and 206) have no identifiable vessel forms or sherds with diagnostic surface treatments or temper. These features cannot be assigned to a specific phase within either the Emergent Mississippian or Mississippian periods. Only one sherd was recovered from Feature 174, a plain grog-tempered body. This feature cannot be assigned with confidence to the Late Woodland, Emergent Mississippian, or Mississippian periods.

Wall-Trench Structures. Only three wall-trench structures are present at the Stemler Bluff site. One is located at the north end, one at the east end, and one at the south end of the site. One feature, 9/158, has a radiocarbon date of 1010±60 B.P. that has two date ranges when calibrated. These span the period defined for the George Reeves through Moorehead phases. The ceramics from this feature include one plain shell/grit-tempered Type 5 jar and one plain shell/grit-tempered angled rim jar. The angled rim jar is similar to others characteristic of the Sand Prairie phase. Also present are three red-slipped limestone-tempered body sherds, three red-slipped grog-tempered bodies, 39 plain shell-tempered bodies, 11 plain shell-and-grit tempered bodies, and one eroded shell-tempered body. Shell temper and red slip are characteristic of later Emergent Mississippian and Mississippian phases. This feature is assigned to the Sand Prairie phase based on these characteristics and the angled-rim jar.

Feature 236 consists of both a wall-trench structure and a bell-shaped pit. The structure is superimposed on the pit. Identifiable vessels were recovered only from the internal pit and include one Type 3 jar and two Type 4 jars. One MCS body sherd is also present. One of the Type 4 jars is shell/grog-tempered, suggesting it dates to the George Reeves phase or later. The structure itself contains only five body sherds, two of which are limestone-tempered and three grog-tempered.

Feature 96 contains only one potentially diagnostic sherd: a red-slipped limestone-tempered body. The feature probably dates to the George Reeves phase or later.

Summary. The paucity of temporally diagnostic ceramics makes it difficult to assign most structures to a single phase. Only seven structures—six single-post-and-basin (one Patrick, one Dohack, and four Lindeman) and one wall-trench (Sand Prairie)—are classified to a single phase. All but one of the remaining single-post-and-basin structures and the two remaining wall-trench structures are best classified as late Emergent Mississippian or later (Table 5-7). The number of sherds present in the structures varies widely (from 1 to 1,051).

General Chronology

The ceramic assemblage from 11MO891 indicates that the site was occupied over a period of several hundred years encompassing several phases.

Table 5-7. Temporal Assignment of Structures Based on Ceramic Data.

Feature Number	Structure Type	Temporal Assignment
9/158	Wall Trench	Sand Prairie phase
10/157	Single-Post-and-Basin	Lindeman phase
15	Single-Post-and-Basin	Emergent Mississippian or later
23	Single-Post-and-Basin	Range phase or later
38	Single-Post-and-Basin	George Reeves phase or later
40	Single-Post-and-Basin	Dohack phase?
42	Single-Post-and-Basin	Emergent Mississippian
48	Single-Post-and-Basin	Lindeman phase
83	Single-Post-and-Basin	Emergent Mississippian or later
87	Single-Post-and-Basin	George Reeves phase or later
90	Single-Post-and-Basin	Range phase or later
96	Wall Trench	George Reeves phase or later
107	Single-Post-and-Basin	Lindeman phase
119	Single-Post-and-Basin	Range phase or later
128	Single-Post-and-Basin	George Reeves phase or later
141	Single-Post-and-Basin	Emergent Mississippian or later
159	Single-Post-and-Basin	Lindeman phase or later
174	Single-Post-and-Basin	Unknown
177	Single-Post-and-Basin	Emergent Mississippian or later
178	Single-Post-and-Basin	George Reeves phase or later
206	Single-Post-and-Basin	Emergent Mississippian or later
221	Single-Post-and-Basin	Lindeman
222	Single-Post-and-Basin	George Reeves or Lindeman
236	Wall Trench	George Reeves or later
269	Single-Post-and-Basin	Patrick phase

Although only a small percentage of the features can be assigned with confidence to specific phases, the ceramics indicate that most features date to the Emergent Mississippian period. Those features with ceramics that can be assigned to specific phases suggest that occupation at the site consisted of only one or a few households at any given point in time.

Woodland Period. One grog-tempered, plain and punctated body sherd was recovered from an internal feature in Feature 221, a single-post-and-basin structure with a radiocarbon date of 940±70 B.P. that calibrates to the period defined for the Lindeman through Moorehead phases. The sherd is too incomplete to identify positively but resembles other Middle Woodland punctated types (e.g., Fortier et al. 1983:Figure 16; 1989:Plate 30, Plate 42). Since the internal feature appears to be coeval with the structure, the sherd probably has been incorporated into the feature fill. One single-post-and-basin structure (Feature 269) contains only grog-tempered sherds. Because all of the cordmarked sherds have

S-twist cordmarks, this feature is assigned to the Late Woodland Patrick phase. Although several other features (118, 143, 163, and 201) contain only grog-tempered sherds, none is necessarily diagnostic of the Late Woodland period. As well, 12 identified rims have cordmarked superior surfaces, but the features in which they were found probably do not date to the Late Woodland period given the majority of Emergent Mississippian ceramics in them. They are either remnants from a Late Woodland occupation at the site or such decoration persisted as a minor decorative element into the Emergent Mississippian period.

Emergent Mississippian Period. Significant Emergent Mississippian components have been identified at several sites in the southern American Bottom for which data is available: Marge, Range, Marcus, Dohack, George Reeves, and Joan Carrie. Most of the features at Stemler Bluff date to this period, although phase assignments cannot be determined for many of them. The nature of the ceramic assemblage indicates that the site probably was occupied most intensively during the Lindeman phase, 1000–950 B.P. (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984; Kelly et al. 1990). The near absence of interior rim decoration and the relative proportions of plain-necked jars and jar types suggest that the Dohack phase (1150–1100 B.P.) is only lightly represented. One single-post-and-basin structure (Feature 40) may date to this phase. Ten features (8, 10/157, 48, 72, 79, 107, 124, 210, 221, 223) appear to date to the Lindeman phase. All contain either Type 5 jars or jars with a distinctive notched rim that elsewhere has been assigned to the Lindeman phase (e.g., the Marge, Range, and George Reeves sites). In all, 27 features contain shell-tempered (or shell in combination with other tempers) sherds. According to Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey (1984:142), shell-tempered ceramics do not appear until the George Reeves phase in the southern American Bottom, when they most likely appear as nonlocal vessels. Use of shell temper increased through time from that point. Features in this category that have not already been assigned to specific phases may, then, actually date to the Lindeman phase or later given that the occupants of this upland site may not have partaken as fully in interregional exchange as did those of floodplain sites.

Mississippian Period. Several features can be dated to Mississippian phases. Features 159 and 235 contain everted jar rims characteristic of the Lindhorst (Lohmann) phase (950–900 B.P.) that have been identified at sites such as Turner and DeMange (Milner 1983b:55, k). Feature 258 contains Ramey Incised body sherds, suggesting it dates to the Stirling phase. Unfortunately these sherds are too small to determine the decorative design or compare to vessels from other sites. Feature 9 contains a shell-tempered angled jar similar to those dating to the Sand Prairie phase (700–550 B.P.) at other sites such as Florence Street (Emerson et al. 1983: 81, 3) and Julien (Milner 1984c:78, b). These features show a distinct clustering at Stemler Bluff, with small groups of features present at the north, south, and east edges of the site.

Summary

In general, the ceramic assemblage from Stemler Bluff fits within the Emergent Mississippian and Mississippian patterns for the southern American Bottom. The vessel forms present—jars, bowls, and pinch pots—are like those identified at other Emergent Mississippian and Mississippian sites in the American Bottom. However, specific deviations from these patterns are present in the Stemler Bluff assemblage. Stumpware, bottles, and funnels, which are commonly identified at other sites from these periods, are not present at Stemler Bluff. Although the reasons for this are not understood at this time, the situation is not unique to this site; these vessel forms are missing from the ceramic assemblage of the Marge site as well. This absence, as well as the differences in frequencies of surface treatment, decoration, and vessel form, could be explained by one or more factors such as geographic location or cultural or ethnic differences between the Stemler Bluff inhabitants and other groups inhabiting the floodplain and more northern areas of the American Bottom. Given that only limited investigations of upland sites have been undertaken to date, Stemler Bluff may actually be typical of such sites.

CHAPTER 6.
LITHIC ANALYSIS

Lithic remains represent the largest artifact set recovered from Stemler Bluff (n=56,771; Appendix D). Of these, 56,659 were recovered from feature contexts, and the remaining 112 were found while scraping the surface to expose features. Lithic remains consist of chipped-stone artifacts (tools and chipping debris), cobble tools, ground-stone tools, and a variety of miscellaneous materials. Lithic artifacts can be used to address several issues relating to the occupation of prehistoric sites. Here, they will be used to investigate questions of site chronology, function, and lithic raw material utilization.

Although information regarding site chronology at 11MO891 is derived primarily from ceramic analyses and radiometric dates, diagnostic projectile points can complement this information. Projectile points have been identified through comparisons with defined types throughout the Midwest, particularly in the American Bottom region.

Site functions can be inferred through the examination of several characteristics of the lithic assemblage. In this chapter site functions are proposed on the basis of the presence and proportions of artifact and debitage types. In addition, artifact and debitage data are incorporated into models of lithic manufacturing systems which permit conclusions regarding stages of artifact production represented at the site (see Volume 2, Chapter 5, this report). Finally, edge-wear analysis was conducted on a small sample of artifacts from the site in order to determine the functions of particular artifact types. It is anticipated that the identification of site activities will allow conclusions to be drawn regarding the possible role of 11MO891 in the Emergent Mississippian/Mississippian settlement system in this area.

Another issue addressed here is the pattern of chert raw material utilization at the site. Identification of such utilization and comparison with geological outcrops of these materials facilitates assessment of the direction and intensity of group movements and/or social contacts between geographically segregated groups. In addition, chert raw material data can be used to reveal patterns of differential use of certain raw materials for particular artifact types.

The first part of this chapter presents a description of the lithic artifacts recovered from Stemler Bluff. This is followed by a discussion of lithic reduction strategies represented as inferred from the lithic tools and debitage recovered. Next is a summary of the chert raw materials represented followed by a discussion of the results of use-wear analysis of selected chert artifacts. Finally, the 11MO891 lithic assemblage is compared to contemporaneous sites in the American Bottom region.

Chipped Stone

The chipped stone assemblage from Stemler Bluff consists of both formally shaped tools and lithic chipping debris (Appendix D). Formal retouched tool types are relatively uncommon at the site and are dominated by bifacial artifacts such as projectile points. The bulk of the lithic material consists of waste debris produced by the manufacture of tools and flakes. Unmodified chert debris, such as flakes and blades, possess edges that can be utilized with little or no edge modification. Lithic assemblages based on the use of such artifacts are referred to as "expedient technologies" and may reflect easy access to an abundant source of lithic raw material (Koldehoff 1987; Parry and Kelly 1987). As will be discussed below, the 11M0891 assemblage appears to be an example of an expedient lithic technology.

Projectile Points

Fifty-one projectile points were recovered during the Phase III excavations (Tables 6-1 through 6-7). Of these, 44 were recovered from feature contexts while the rest were either piece plots between features or were recovered during surface scraping.

Table 6-1. Attributes of Early Archaic Projectile Points.

Provenience	Length	Width	Thickness	Weight	Type	Raw Material	Condition
Piece Plot 6	N/A	35.0	9.0	16.0	Stilwell	Burlington	Stem/ midsection
Feature 79	58.4	26.9	8.4	13.5	Hardin Barbed	Undetermined	Complete
Feature 149	N/A	N/A	5.4	32.8	Kirk Corner Notched	Burlington	Stem/ midsection
Feature 223	42.0	24.0	7.0	5.2	Kirk Corner Notched	Salem	Complete
Excavation Block 4	N/A	N/A	3.0		Big Sandy	Undetermined	Base Fragment

Note: All weights are in grams and measurements are in mm.

Table 6-2. Attributes of Middle Archaic Projectile Points.

Provenience	Length	Width	Thickness	Weight	Type	Raw Material	Condition
Fea. 119	43.6	27.7	9.3	10.5	Godar	Burlington	Complete
Fea. 139	N/A	28.0	9.0	5.8	Godar	Burlington	Stem/midsection
Fea. 215	N/A	N/A	5.0	1.9	Raddatz Side Notched	Burlington	Stem

Note: All weights are in grams and measurements are in mm.

Table 6-3. Attributes of Late Archaic Projectile Points.

Provenience	Length	Width	Thickness	Weight	Type	Raw Material	Condition
Piece Plot 7	70.0	32.3	10.0	20.0	Karnak Stemmed	Burlington	Complete
Feature 23	N/A	44.5	10.9	24.7	Etley Corner Notched	Burlington	Stem/ midsection
Feature 235	108.8	39.0	12.6	52.1	Wadlow	Salem	Complete
Piece Plot 18	N/A	42.0	10.0	30.5	Ledbetter Cluster	Burlington	Distal broken
Feature 210	N/A	N/A	N/A	4.1	Ledbetter Stemmed	Burlington	Stem

Note: All weights are in grams and measurements are in mm.

Table 6-4. Attributes of Early Woodland Projectile Points.

Provenience	Length	Width	Thickness	Weight	Type	Raw Material	Condition
Feature 104	86.0	38.5	10.6	20.8	Dickson Contracting Stem	St. Louis	Distal Broken
Excavation Block 1	40.9	11.9	24.7		Dickson Contracting Stem	Burlington	Stem/ midsection

Note: All weights are in grams and measurements are in mm.

Table 6-5. Attributes of Middle Woodland Projectile Points.

Provenience	Length	Width	Thickness	Weight	Type	Raw Material	Condition
Piece Plot 1	N/A	40.0	9.0	15.0	Snyders	Burlington	Distal/basal damage
Feature 40	39.0	35.0	6.0	10.3	Affinis Snyders	Burlington	Complete
Feature 113	42.0	34.0	8.0	10.6	Snyders	Burlington	Basal damage
Feature 140	N/A	45.0	8.0	9.3	Snyders	Burlington	Stem/midsection

Note: All weights are in grams and measurements are in mm.

Table 6-6. Attributes of Middle/Late Woodland Projectile Points.

Provenience	Length	Width	Thickness	Weight	Type	Raw Material	Condition
Piece Plot 23	56.0	20.6	10.0	10.9	Chesser Notched	Burlington	Complete
Feature 21	41.3	27.0	8.5	8.5	Steuben Expanded Stem	Burlington	Complete
Feature 119	N/A	21.8	7.4	9.8	Lowe Cluster	Burlington	Stem/midsection

Note: All weights are in grams and measurements are in mm.

Table 6-7. Attributes of Late Woodland/Emergent Mississippian Projectile Points.

Provenience	Length	Width	Thickness	Weight	Type	Raw Material	Condition
Feature1/2	23.0	14.0	4.0	0.8	Sequoyah Side Notched	Burlington	Complete
Feature 21	22.0	10.0	3.0	0.7	Sequoyah	Burlington	haft missing
Feature 36	N/A	12.0	N/A	0.4	Roxana Expanding Stem	Fern Glen	base/stem
Feature 36	25.2	11.3	3.5	0.6	Wanda Side Notched	Salem	Distal tip broken
Feature 40	19.3	12.9	3.0	0.6	Klunk Side Notched	Burlington	Complete
Feature 40	20.0	8.0	1.0	0.5	Koster Side Notched	Burlington	Complete
Feature 40	20.5	10.2	0.3	0.7	Sequoyah Side Notched	Burlington	Complete
Feature 61	40.0	27.5	4.2	2.8	Wanda Corner Notched	Burlington	Distal tip broken
Feature 61	29.8	14.6	4.7	1.2	Wanda Side Notched	Burlington	Distal tip broken
Feature 79	32.0	20.5	4.5	2.5	Roxana Expanding Stem	Burlington	Unfinished
Feature 87	N/A	10.3	3.4	0.8	Scallorn	Burlington	Distal tip broken
Feature 103	27.8	16.2	4.2	1.6	Madison Triangular	St. Louis	Complete
Feature 119	N/A	17.0	3.0	2.3	Dupo	Burlington	Distal tip broken
Feature 119	N/A	13.0	3.0	0.4	Sequoyah Side Notched	Burlington	Distal tip broken
Feature 119	N/A	18.3	3.8	1.6	Wanda Side Notched	Burlington	Distal end missing
Feature 119	35.7	15.1	5.6	2.6	Klunk Side Notched	Salem	Complete
Feature 119	24.2	11.2	4.9	1.4	Roxana Straight	Mounds	Complete
Feature 119	31.0	18.0	3.0	2.5	Madison Triangular	Fern Glen	Complete
Feature 119	28.0	13.0	3.0	2.1	Sequoyah Side Notched	Ste. Genevieve	Distal tip broken
Feature 119	N/A	18.0	2.0	2.5	Madison Triangular	Burlington	Proximal fragment
Feature 119	N/A	12.0	2.0	1.0	Madison Triangular	Burlington	Proximal fragment
Feature 126	N/A	12.0	3.0	0.7	Sequoyah Side Notched	Burlington	Distal end missing
Feature 127	33.0	13.5	4.0	1.3	Scallorn Corner Notched	Burlington	Complete
Feature 133	N/A	13.0	2.5	0.5	Sequoyah Corner Notched	Burlington	Distal end missing
Feature 178	N/A	13.0	3.0	0.6	Koster Side Notched	Burlington	Distal end missing
Feature 182	23.0	11.0	3.0	1.3	Koster Side Notched	Burlington	Complete
Feature 210	N/A	12.1	3.2	0.8	Sequoyah Side Notched	Burlington	Base missing
Feature 258	34.5	17.6	5.7	2.5	Madison Triangular	Salem	Complete
Feature 269	15.4	10.0	2.6	0.3	Klunk Side Notched	Burlington	Complete

Note: All weights are in grams and measurements are in mm.

Thirteen Archaic period projectile points were recovered from the site. The Early Archaic period is represented by one Hardin Barbed, two Kirk Corner Notched, one Stilwell, and one Big Sandy projectile points (Justice 1987; Perino 1971b) (Plate 6-1, a-d, Table 6-1). Three Middle Archaic Large Side Notched types were recovered (Justice 1987) (Plate 6-1, e-g, Table 6-2). One of these is a Raddatz Side Notched type while the other two are classified as Godar points, a morphological correlate of the former. The Late Archaic is represented by five projectile points (Justice 1987; Dale McElrath, personal communication 1996) (Plate 6-1, h-l, Table 6-3). One of these has been classified as an Etley Corner Notched type, two are assigned to the Ledbetter Cluster, one is a Karnak Stemmed type, and one is a Wadlow type. The Etley and Wadlow points date to the Titterington phase of the Late Archaic period in the American Bottom.

The majority of projectile point types recovered from 11MO891 belong to the Woodland and Mississippian periods. Although Early, Middle, and Late Woodland types were found at the site, Late Woodland/Emergent Mississippian types dominate the projectile point collection. The Early Woodland is represented by two Dickson Contracting Stem points (Justice 1987) (Plate 6-2, a-b, Table 6-4). The four Middle Woodland types, one of which has been recycled into an end scraper, are assigned to the Snyders Cluster (Justice 1987) (Plate 6-2, c-f, Table 6-4). Three points have been classified as Lowe Cluster types (Justice 1987), which date to the Middle to Late Woodland periods (Plate 6-2, g-i, Table 6-6). Lowe Cluster points from Stemler Bluff consist of one Steuben Expanded Stem, one Chesser Notched, and one example which could not be assigned to a specific type within this group.

The most common projectile points recovered from the site are various types of Late Woodland/Emergent Mississippian forms, representing 57 percent (n=29) of all points recovered from the Stemler Bluff site (Justice 1987; Kelly et al. 1987, 1990; Munson and Harn 1971; Perino 1971b) (Plate 6-3, Table 6-7). Six points are assigned to the Late Woodland/Mississippian Triangular Cluster (Plate 6-3, a-f, Table 6-7). These include five Madison points and one Dupo type, which date to the Patrick phase of the Late Woodland in the American Bottom. Points belonging to the Scallorn Cluster are the most common types (Plate 6-3, g-aa, Table 6-7). Within this cluster, various types of Sequoyah points predominate. These include three Koster, eight Sequoyah, four Wanda, three Klunk Side Notched, and three Roxana points. In addition, there are two points which could not be assigned to specific subtypes within the Scallorn Cluster (Plate 6-3, bb-cc, Table 6-7).

The dominance of Late Woodland/Emergent Mississippian projectile point types at Stemler Bluff is consistent with the temporal assignment based on the ceramic assemblage and the radiocarbon dates. The presence of point types dating to earlier periods most likely is the result of both repeated occupation of the site throughout prehistory as well as reuse of early types by the later occupants. The presence of early point types in later-dating features can be attributed to reuse of these artifacts, as is suggested by the broken Middle Woodland Snyders point from Feature 113 which has been recycled into a hafted end scraper (Plate 6-2, d).

Other Chert Tools

Formal retouched tools are relatively rare at 11MO891, represented by 195 artifacts. If Late Woodland/Emergent Mississippian diagnostic projectile points are added to this total, this figure is 224 retouched tools (Table 6-8, Figure 6-1). Late Woodland/Emergent Mississippian projectile points represent 12.9 percent of all retouched tools. The following discussion concerns nondiagnostic artifacts recovered from feature contexts. Lithic material found during surface stripping of excavation blocks is of uncertain context and is tabulated in Appendix D. Bifaces and biface fragments make up the largest category of retouched artifacts at the site (n=81). Thin bifaces are the most common type,

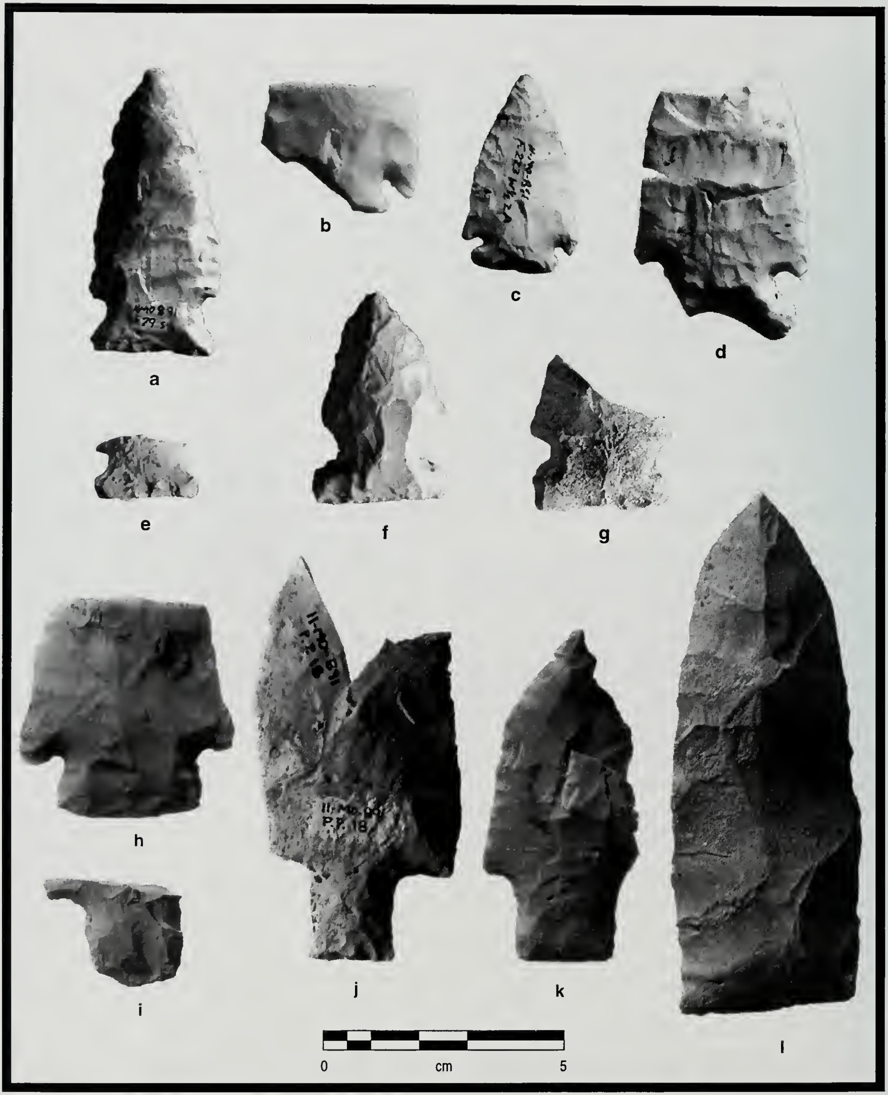

Plate 6-1. Archaic Period Projectile Points: a, Hardin Barbed; b-c, Kirk Corner Notched; d, Stilwell; e, Raddatz Side Notched; f-g, Godar; h, Etley; i-j, Ledbetter Cluster; k, Karnak Stemmed; l, Wadlow.

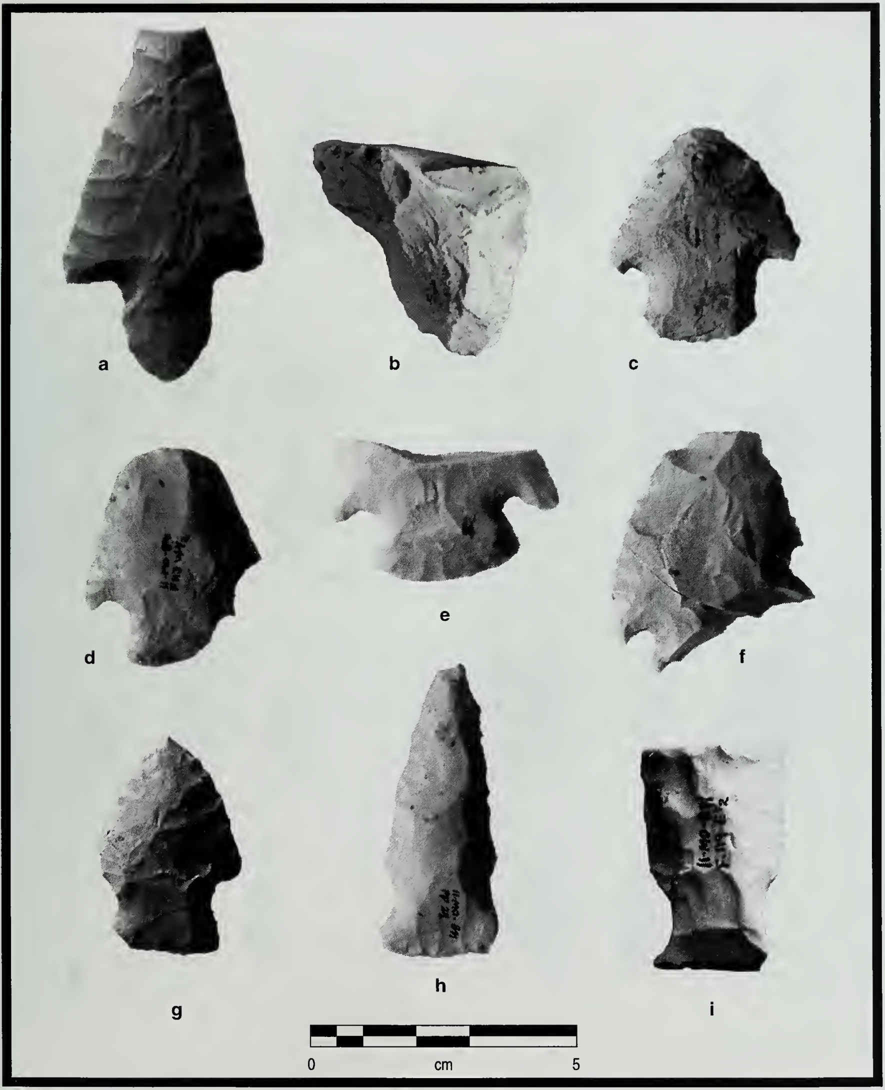

Plate 6-2. Early-Middle/Late Woodland Projectile Points: a-b, Dickson Contracting Stem; c, Affinis Snyders; d-f, Snyders Cluster; g, Steuben Expanded Stem; h, Chesser Notched; i, Lowe Cluster.

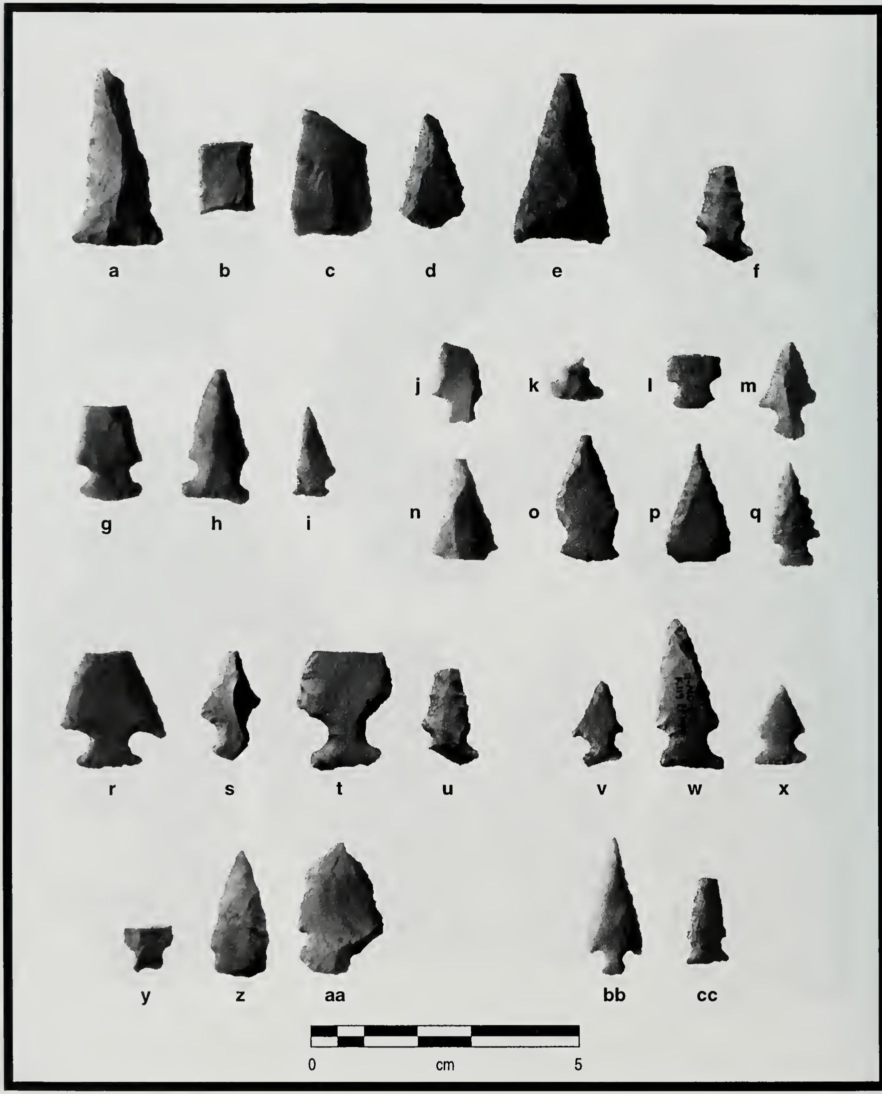

Plate 6-3. Late Woodland/Emergent Mississippian Projectile Points: a-e, Madison; f, Dupo; g-i, Koster; j-q, Sequoyah; r-u, Wanda; v-x, Klunk Side Notched; y-aa, Roxana; bb-cc, Scallorn Cluster.

Table 6-8. Chert Tools Recovered From Features.

Tool Type	n	Percent of All Tools
Perforators	52	23.2
Thin bifaces	37	16.5
Projectile points	29	12.9
Thick bifaces	28	12.5
Retouched flakes	28	12.5
Rough bifaces	16	7.1
Wedges	12	5.3
End scrapers	11	4.9
Chert hammerstones	5	2.2
Hoes	4	1.7
Gouge	1	.4
Burins	1	.4
Total	224	99.6

accounting for approximately 46 percent of all bifaces, followed by thick (34.5 percent) and rough (19.7 percent) types. After bifaces, the most common chert tools are perforators (23.2 percent) (Plate 6-4, a-h), retouched flakes (12.5 percent), wedges (5.3 percent) (Plate 6-4, i), end scrapers (4.9 percent) (Plate 6-4, j-k), chert hammerstones (2.2 percent), hoes (1.7 percent) (Plate 6-4, l-m), gouges (.4 percent), and burins (.4 percent). Finally, the lithic debitage from feature contexts includes 449 utilized flakes and 19 pieces of utilized shatter.

The paucity of formally retouched tools at this site and the abundance of utilized flakes suggest that an expedient tool kit was a major component of the lithic inventory. As will be discussed in more detail below, expedient technologies involve the unpatterned flaking of lithic raw material and a heavy reliance on unmodified chipping debris for tools, and are characteristic of Late Woodland and Mississippian lithic assemblages in the American Bottom region (Koldehoff 1987). A survey of selected Late Woodland/Emergent Mississippian sites indicates that utilized chert debitage represents over half of the chert tool assemblages (Table 6-9). The functions of a sample of these expedients tools from 11MO891are discussed in more detail below.

Debitage

A total of 42,932 pieces of lithic debitage was recovered from feature contexts at 11MO891(Table 6-10, Figure 6-2). Of this, 35.3 percent consists of block shatter, indicating that early stage lithic reduction was a common activity at this site. After shatter, the next most common category of debitage is broken flakes, followed by tertiary flakes, secondary flakes, bipolar flakes, primary flakes, bifacial thinning flakes, blades, and hoe flakes.

Nonchert Lithic Tools

This class of tools consists of cobble and groundstone tools (Table 6-11). Cobble tools (n=154) consist of manos, metates, nonchert hammerstones, and pitted cobbles. Metate fragments are the most common type in this category, representing 46.7 percent of this tool group (Plate 6-5, a). The illustrated example exhibits pitting, indicating that it also functioned as an anvil. This type is followed by hammerstones (40.9 percent), pitted cobbles (6.4 percent), and mano/mano fragments (5.8 percent) (Plate 6-5, b). Ground-stone tools (n=53) consist of sandstone abraders (66 percent) (Plate 6-5, c-e), celts/celt fragments (32 percent) (Plate 6-5, f-g), and one limestone hoe (Plate 6-5, h). Limestone hoes are also reported from the Dohack and Range phase occupations at the Range site (Williams 1990a,b).

Miscellaneous Lithic Material

A variety of lithic raw materials also were recovered from the features at Stemler Bluff (n=12,666). These are summarized in Table 6-11.

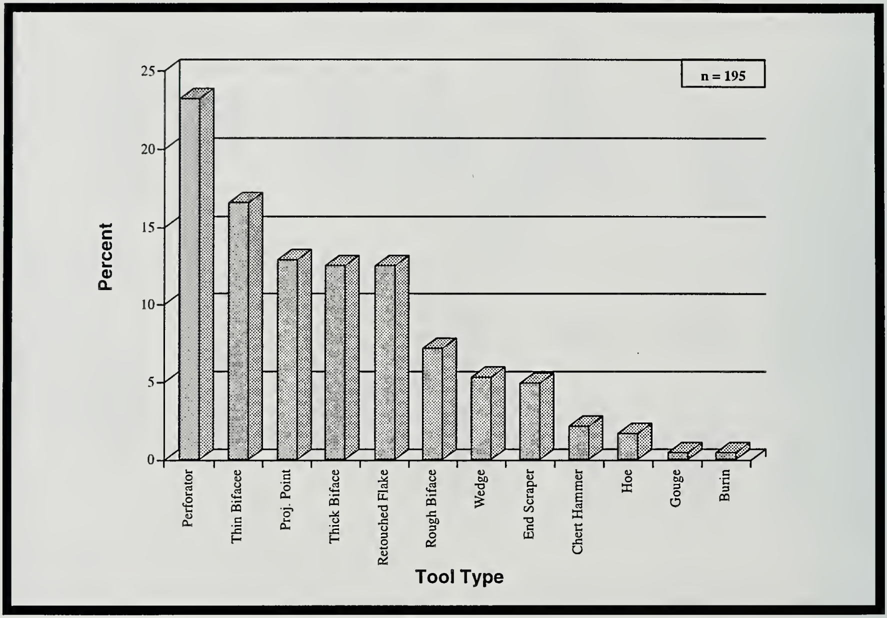

Figure 6-1. Distribution and Frequency of Chert Tools.

The most abundant of these, both by number (n=11,056) and weight, is limestone. This is followed by fire-cracked rock, small rounded pebbles, sandstone, hematite, limonite, unidentified stone, worked limestone fragments, discoidals (Plate 6-6, a-b), fossils, concretions, geodes, igneous stone fragments, and mudstone fragments. Finally, one example of each of the following artifacts was recovered from the site: granite fragment, quartz fragment, stone bead (Plate 6-6, c), and a calcite pipe fragment (Plate 6-6, d). The stone bead is a tubular type, similar to Late Woodland and Emergent Mississippian examples from the AG Church (Koldehoff 1996) and Sponemann (Williams 1991) sites. The pipe fragment consists of a rim from a finely worked, round bowl. X-ray diffraction analysis by the Illinois State Geological Survey determined that the pipe is made from calcite which occurs locally in the Valmeyeran Series of the Mississippian System (Dewey Moore, personal communication 1997). Two limestone pipe bowl fragments similar to that from Stemler Bluff are reported from the Dohack phase occupation at Range (Williams 1990a:220), and a large limestone effigy pipe was found at AG Church (Koldehoff et al. 1990).

Lithic Reduction Strategies

A total of 573 chert cores was recovered from feature contexts at Stemler Bluff (Table 6-12).The most common among these are bipolar cores, rep-

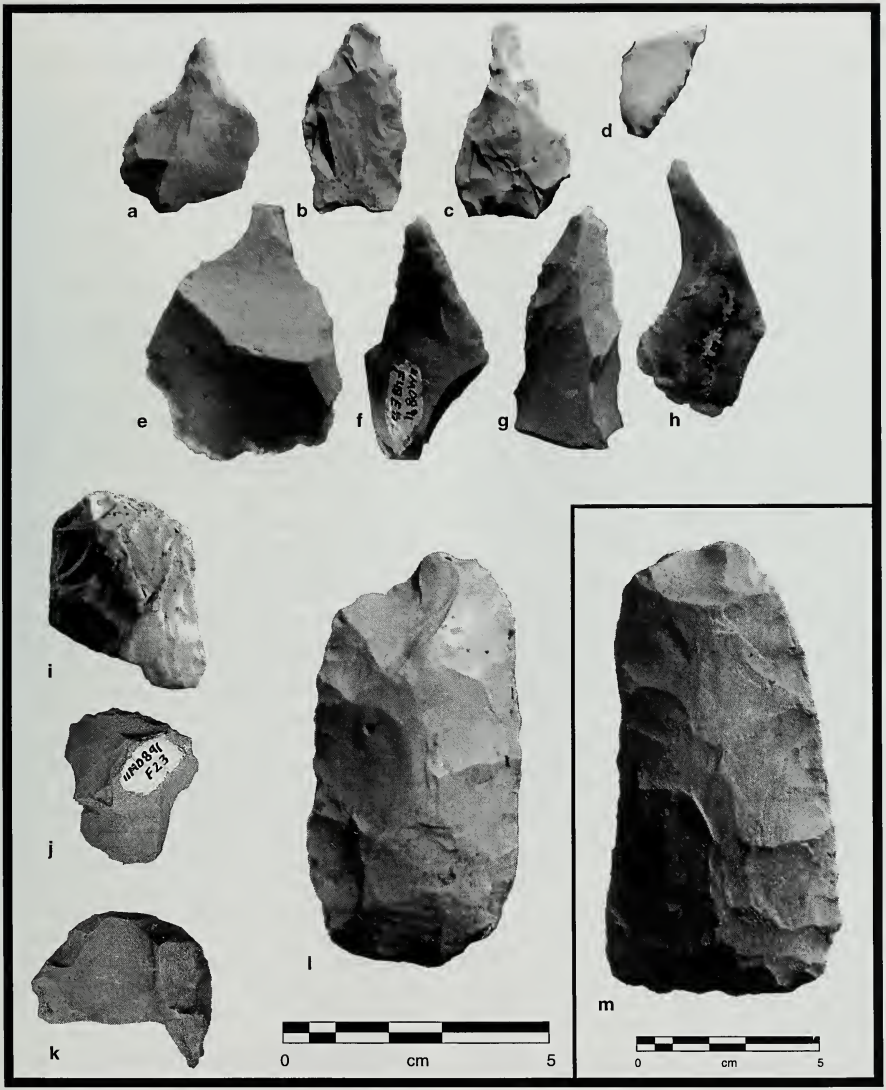

Plate 6-4. Chert Tools: a-h, Perforators; i, Wedge; j-k, End Scrapers; l-m, Hoes.

Table 6-9. Frequencies of Utilized Chert Debitage from Selected Late Woodland and Emergent Mississippian Sites in the American Bottom.

Site	Setting	Number of Utilized Pieces	Percentage of Chert Tools
BBB Motor	Floodplain	1,281	91.9
Robinson's Lake	Floodplain	278	89.3
Sponemann	Floodplain	989	80.6
Stemler Bluff	Uplands	468	67.7
Joan Carrie	Uplands	12	34.2

resenting 68.2 percent of all cores (Plate 6-7, a-b). This type is followed by multidirectional cores (Plate 6-7, c), plano-convex cores (Plate 6-7, d), unidirectional cores, and exhausted cores/core fragments. In addition to cores, 42 pieces of chert, some (n=18) of which appear to have been tested prehistorically for quality, were recovered.

Cores recovered from 11MO891 permit some conclusions regarding lithic reduction strategies at the site. To begin, the abundance of cores indicates that lithic reduction was an important activity at Stemler Bluff, most likely relating to the abundance of chert in the adjacent bluffs. A survey of other Emergent Mississippian assemblages in the American Bottom region indicates that the cores are much more common at 11MO891 than elsewhere (Table 6-13). Given the relatively small size of the Stemler Bluff occupation, the number of cores appears unusually high. Indeed, the closest values are from the Dohack and Range phase components of the Range site, which produced 429 and 356 cores, respectively (Williams 1990a, b). Based on the number of structures and features, the Emergent Mississippian components at Range clearly represent more intensive occupations than is probable at Stemler Bluff, yet lithic reduction does not appear to have been as important at the former as the latter.

Bipolar and multidirectional cores together account for 94 percent of all cores from 11MO891, and this pattern permits conclusions to be drawn about the lithic reduction strategies employed by the prehistoric inhabitants of the site. Koldehoff (1987:171) has proposed that different core types derived from a particular component of a site can be interpreted as representing points along a continuum of a lithic reduction strategy, and based on his analysis of lithic material from the east stockade area at Cahokia, he recognizes two chert reduction strategies for the Emergent Mississippian and Mississippian periods. The Ste. Genevieve trajectory results in the production of flakes, block shatter and exhausted cores while the Burlington trajectory produces flakes and block shatter, as well as "secondary" cores (e.g., multidirectional, bipolar, microlithic, and exhausted cores) produced from large flakes and block shatter. The different by-products resulting from the flaking of these two raw materials reflects differences in their size and quality. Ste. Genevieve chert occurs as small nodules and is more brittle than Burlington chert, and therefore does not yield fragments suitable for use as secondary cores. At the Merrell Tract at Cahokia, Kelly (1984:43) observed that small nodular chert such as Ste. Genevieve was commonly reduced using a bipolar technology alone.

In the Stemler Bluff assemblage, 86.3 percent of cores made from Ste. Genevieve chert are bipolar, which suggests that, as at the Merrell Tract, this small nodular chert type was primarily reduced

Table 6-10. Lithic Debitage from Features.

Debitage Type	n	%
Block shatter	15,189	35.3
Broken flake	11,347	26.4
Tertiary flake	6,809	15.8
Secondary flake	4,502	9.4
Bipolar flake	2,309	5.3
Primary flake	1,938	4.5
Bifacial thinning flake	855	1.9
Blade	351	.8
Hoe flake	82	.1
Total	42,932	99.5

using a bipolar technology (Table 6-14). The remaining core types are represented primarily by Burlington, Fern Glen, and Salem cherts, and it is suggested here that reduction of these materials followed the Burlington trajectory. At 11MO891, 75 percent of Fern Glen, 61 percent of Burlington, and 71 percent of Salem cores are bipolar types while 34 percent of Burlington, 27 percent of Salem, and 15 percent of Fern Glen cores are multidirectional. It is suggested here that initial reduction of Burlington, Fern Glen, and Salem chert was accomplished by random, free-hand flaking which produced multidirectional cores. This process produced an abundance of large flakes and block shatter which in turn were further reduced using the bipolar technique. The paucity of multidirectional cores made from Ste. Genevieve chert together with the small size of this material suggests that the bipolar reduction trajectory was the primary strategy utilized for this material.

Elsewhere in the American Bottom region an abundance of these two core types has been interpreted as evidence of an expedient lithic reduction technology (Koldehoff 1987). Such technologies involve "...simple pounding or smashing of cores in an expedient, nonformalized manner..." (Koldehoff 1987:167), and are characteristic of the American Bottom region from the Late Woodland through the Mississippian periods. Expedient technologies are correlated with increased sedentism and are highly wasteful of raw material. Such wastefulness can be explained by both the abundance of chert raw material in the region as a whole and the ease of access due to intraregional exchange networks in the densely settled American Bottom region (Koldehoff 1987:175). At the Stemler Bluff site it was most likely the rich supply of chert raw materials in the nearby bluff face which permitted the site inhabitants to invest little time and effort into core reduction and tool manufacture (Parry and Kelly 1987).

Additional information on lithic-reduction stages can be gleaned through a consideration of ratios of core to flakes and shatter to flakes. Jefferies (1982) has demonstrated that sites located closest to raw material sources produced debris from all stages of reduction and a core:flake ratio of 1:83 while upland sites with more limited access to chert raw materials produced a core:flake ratio of 1:500. These figures are useful indicators of the amount of early and late stage lithic reduction performed at a site: sites located at a raw material source are expected to exhibit all stages of lithic reduction and a low core:flake ratio while sites located away from lithic sources should be dominated by late stage reduction and high flake:core ratios. At Stemler Bluff, the ratio of cores to flakes is 1:47, which is closest to the value derived by Jefferies for sites located near lithic sources.

The ratio of shatter to flakes is another useful indicator of the range of lithic-reduction stages represented at a site (Morrow 1982). Shatter is produced during the early stages of lithic reduction and is expected to be more abundant than other debris categories at sites where initial reduction was common. At Stemler Bluff, the shatter:flake ratio is 1:1.8, or approximately one piece of shatter for every two flakes. At BBB Motor (Emerson and Jackson 1984), an American Bottom floodplain site

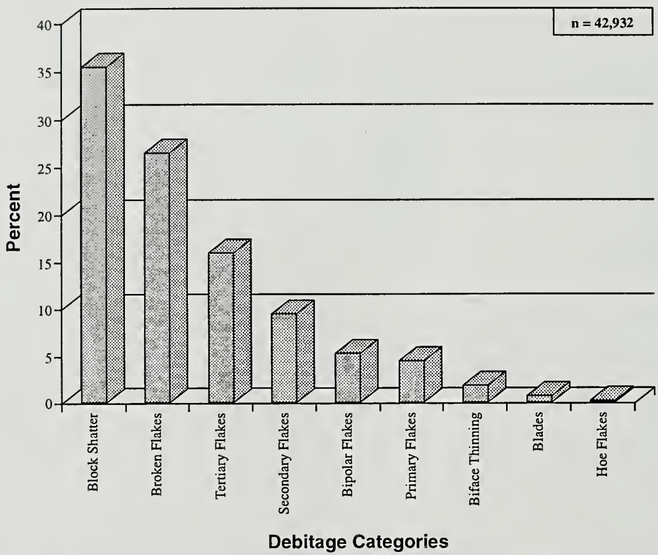

Figure 6-2. Distribution and Frequency of Debitage Categories.

located approximately 1 km from the bluff line where chert outcrops occur, the shatter:flake ratio is 1:1.4, or about one piece of shatter for each flake. This indicates that shatter is nearly twice as abundant at Stemler Bluff than at BBB Motor, which most likely reflects the abundant lithic raw material available at the former. The shatter:flake ratio, together with the abundance of cores from Stemler Bluff, once again emphasizes the importance of all stages of lithic-reduction activities at the site.

Raw Material Utilization

Lithic raw material types were analyzed for a sample of 30 features at Stemler Bluff. This sample was chosen based on the presence of diagnostic artifact types (ceramics and lithics) or the availability of radiocarbon dates. The sample consists of 14,271 artifacts, of which raw material type could not be determined for 2,718 pieces due to factors such as burning, small artifact size or inability to match samples with comparative pieces collected from the region.

Cryptocrystalline raw materials utilized at 11MO891 were available locally in the Valmeyer Anticline in Dennis Hollow and adjacent bedrock exposures along the bluff line, and it appears that these sources were primarily utilized (Odom et al. 1961) (Appendix E). Nonlocal raw materials include Kincaid, Kaolin, and Mill Creek cherts. As Table 6-

Table 6-11. Cobble Tools, Ground-Stone Tools, and Miscellaneous Material from Features.

Tool Type	n	%
Cobble Tools		
Metate/metate fragments	72	46.7
Hammerstones	63	40.9
Pitted cobbles	10	6.4
Mano/mano fragments	9	5.8
Ground-Stone Tools		
Sandstone abraders	35	66.0
Celt/celt fragments	17	32.0
Limestone hoe	1	1.8
Miscellaneous Material		
Limestone	11,056	87.2
Fire-cracked rock	511	4.0
Small rounded pebbles	407	3.2
Sandstone	263	2.0
Hematite	151	1.1
Limonite	158	1.2
Unidentified stone	76	.6
Worked limestone	11	.08
Discoidals	9	.07
Fossils	6	.04
Concretions	5	.03
Geodes	3	.02
Igneous stone fragments	4	.03
Mudstone fragments	2	.01
Granite fragments	1	.0007
Quartz fragments	1	.0007
Stone bead	1	.0007
Calcite pipe fragment	1	.0007

15 shows, the most commonly utilized raw materials were Salem and Burlington chert, each accounting for a approximately one-third of the total number of artifacts analyzed. Fern Glen chert accounts for a little less than 25 percent of the sample (Figure 6-3). These three raw material types together account for almost 90 percent of the raw materials at Stemler Bluff, both in terms of number of artifacts and weight. These types are followed by Ste. Genevieve and St. Louis cherts, which together account for approximately ten percent of the identified artifacts (7.4 percent by weight).

The remainder of the identified sample consists of small amounts of nonlocal raw materials. Mill Creek, Cobden, Kaolin, Kincaid, and Elco cherts together represent 1.5 percent by count and 1.2 percent by weight of the analyzed sample. Natural outcrops of these five raw materials occur between 100 and 170 km southeast of the site.

The chert raw material analysis indicates that the prehistoric inhabitants of Stemler Bluff primarily utilized lithic material which was available in the bluff immediately west of the site. This conforms with the pattern of lithic resource exploitation noted for other contemporary sites in the American Bottom region (Kelly 1984; Koldehoff 1996). Mill Creek chert was commonly used to produce bifacial hoes and is represented at Stemler Bluff by hoe sharpening flakes.

While both chert debitage and retouched tools are represented almost entirely by local lithic raw materials, the pattern of chert utilization differs slightly for the retouched tools (Figure 6-3). As stated above, the analyzed sample of lithic material is dominated by Salem and Burlington chert which occur in nearly equal amounts. However, when considered as a subsample, retouched tools (n=120) are dominated by Burlington chert (63.3 percent), followed by Salem (20.0 percent) then Fern Glen (9.1 percent). Further, with the exception of a single wedge made from Ste. Genevieve chert, all retouched tool types are made primarily from Burlington chert, followed by Salem and Fern Glen. This pattern suggests that Burlington chert was preferred for the production of formal tools. This same pattern holds for utilized artifacts (n=219) in the analyzed sample, which are dominated by Burlington chert (38.3 percent), followed by Salem (27.8 percent) and Fern Glen (20.5 percent).

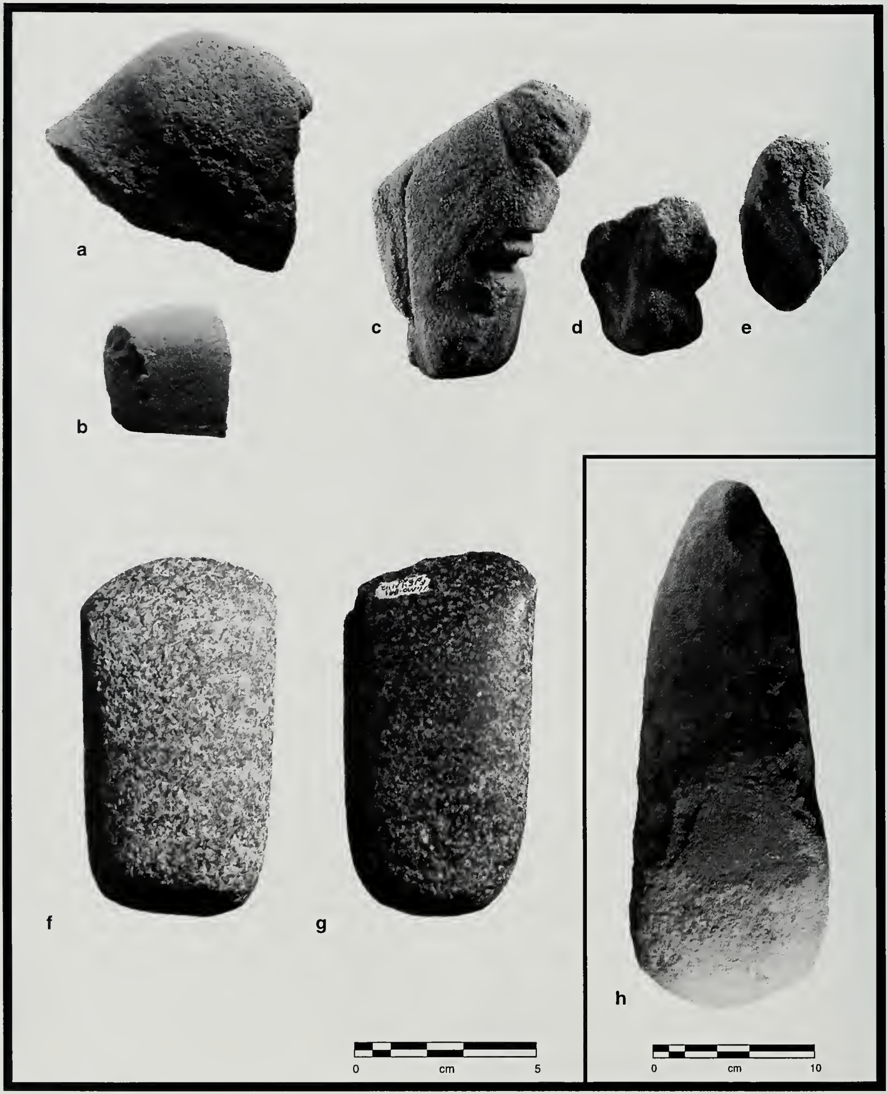

Plate 6-5. Nonchert Tools: a, Metate Fragment; b, Mano Fragment; c-e, Sandstone Abraders; f-g, Celts; h, Limestone Hoe.

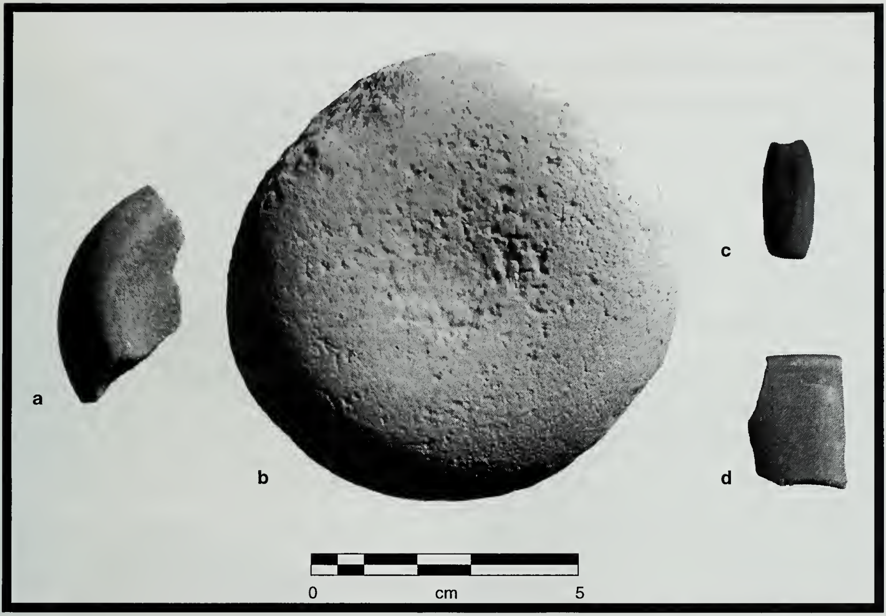

Plate 6-6. Miscellaneous Lithic Artifacts: a-b, Discoidals; c, Stone Bead; d, Calcite Pipe Fragment.

An Example of Expedient Tool Use: Microwear Evidence

As stated above, the paucity of formally retouched tools at Stemler Bluff suggests that expedient tools were primarily used. Such tools exhibit minimal or complete lack of edge modification and may consist of suitably sized and shaped pieces of debitage selected from debris produced by raw material reduction. Microscopic analysis of a sample of lithic artifacts from 11MO891 provides evidence for the function of expedient tools at this site.

The Analyzed Sample

A high-power microwear analysis was performed on nine artifacts from the 11MO891 collection (Table 6-16). These consisted of four secondary flakes, two pieces of block shatter, one primary flake, one blade, and one chert cobble. These pieces were chosen for analysis because edge damage patterns suggestive of utilization were present on the secondary blade and block shatter, and due to the presence of a smooth, glossy polish (visible to the unaided eye) on all pieces.

Investigators working at Mississippian and Emergent Mississippian sites in the American Bottom have recognized two types of macroscopic "gloss" on chert artifacts (Fortier 1985:281; Milner 1983a:83, 1984c:46; Williams 1990b:461). "High gloss" refers to a highly reflective polish on a tool or

Table 6-12. Core Types Recovered from Features.

Core Type	n	%
Bipolar	391	68.2
Multidirectional	148	25.8
Plano-convex	21	3.6
Unidirectional	10	1.7
Exhausted/fragments	3	.3
Total	573	99.7

flake which often exhibits numerous macroscopic striations. This polish is commonly found on chert hoes and hoe sharpening flakes (especially artifacts made from Mill Creek chert), and is the result of repeated contact with soil. "Low gloss" refers to a macroscopic polish on a tool edge which is very smooth but less reflective than high gloss. Macroscopic striations are rare to nonexistent on tool edges exhibiting low gloss. Seven of the artifacts chosen for microwear analysis exhibited a polish which is classified as "low gloss."

The "high-power" method of analysis, which determines tool function based on patterns of microwear polishes, striations, and damage on tool edges, was employed (Keeley 1980). The analysis was performed with a binocular, incident-light microscope with magnifications of 30x–400x. Artifacts were cleaned in an ammonia-based detergent prior to analysis. Preliminary analysis of the tools indicated that additional cleaning in dilute HCl and NaOH to remove organic and inorganic material adhering to tool edges was unnecessary. A comparative collection of 99 experimental stone tools was used to interpret the archaeological use-wear patterns. Experiments were designed to replicate as closely as possible activities that may have been performed aboriginally. These included scraping, cutting, piercing, boring, and sawing. In the following discussion, edge orientation is determined with the bulbar surface facing down and the proximal end towards the analyst.

Two artifacts from Feature 23 were examined. The first is a utilized blade (Salem chert) which exhibited edge damage scars on the left and right lateral edges (Plate 6-8, a). A highly reflective, smooth polish is visible with the naked eye on the right lateral edge. Microscopic wear traces consisted of a pitted, invasive polish which formed a continuous band along the tool edge. These types of traces are associated with dry hide working. The second artifact from this feature is a piece of utilized block shatter made from Burlington chert (Plate 6-8, b). This piece is long and narrow with a triangular cross section. A bright, smooth polish was observed along one lateral edge. Microscopic examination revealed a rough, pitted polish in this area, with several long, narrow striations perpendicular to the edge. The edge has been rounded. These traces indicate that this piece has been used to scrape dry hide.

One utilized secondary flake (Burlington chert) from Feature 36 was examined (Plate 6-8, c). A very narrow band of bright, smooth polish was observed along the distal end of this piece on both the dorsal and ventral surfaces. When viewed under the microscope, this edge exhibited a rough, pitted polish which formed a continuous band along the distal end. The distal end also has been intensively rounded. These wear traces indicate that this flake has been used to scrape dry hide.

Two artifacts were analyzed from Feature 40. One is a utilized primary flake of Salem chert (Plate 6-8, d). The left lateral, dorsal edge of this piece exhibited utilization damage and intensive edge attrition (rounding). Microscopic traces consist of a continuous band of rough, pitted polish and edge rounding that are interpreted as the result of dry hide scraping (Plate 6-8, d, inset). The other analyzed artifact from this feature is a secondary flake (Burlington chert) (Plate 6-8, e). Visual inspection of the piece revealed a highly reflective, smooth polish along the distal end, primarily on the ventral surface. This polish was restricted to a very narrow band along the distal edge. Microwear traces observed on this piece include extensive edge round-

Plate 6-7. Chert Cores: a-b, Bipolar Cores; c, Multidirectional Core; d, Plano-Convex Core.

Table 6-13. Frequencies of Cores at American Bottom Emergent Mississippian Sites.

Site	Setting	No. of Cores	Assemblage Size
Stemler Bluff	Uplands	573	41,995
Range (Dohack phase)	Floodplain	429	861[a]
Range (Range phase)	Floodplain	356	628[a]
Sponemann	Floodplain	84	4,182
AG Church	Uplands	63	2,683
BBB Motor	Floodplain	35	3,577
Robinson's Lake	Floodplain	11	910
Joan Carrie	Uplands	11	536
Marcus	Floodplain	2	90

[a]Retouched tool total only; debitage totals not available.

Table 6-14. Chert Raw Materials and Core Types Present at Stemler Bluff.

	Chert Type					
Core Type	Salem	Fern Glen	Burlington	Ste. Genevieve	St. Louis	Cobden
Bipolar	39	39	25	19	5	0
Multidirectional	15	8	14	2	2	1
Plano convex	0	3	1	0	0	0
Unidirectional	1	1	0	1	0	0
Exhausted	0	0	1	0	0	0
Fragment	0	1	0	0	0	0
Total	55	52	41	22	7	1

ing; a continuous, invasive band of highly pitted polish; and wide, shallow striations perpendicular to the utilized edge. Based on these observations, this piece is interpreted as a dry hide scraping tool.

One thermally altered, utilized secondary flake from Feature 42 was examined (Plate 6-8, f). The right lateral edge of this flake exhibited a smooth, glossy polish and has been dulled from use. Microscopic inspection of this area revealed a continuous band of pitted polish with striations perpendicular to the edge. These traces indicate that this artifact was used to scrape dry hide.

The analyzed artifact from Feature 128 is a piece of utilized shatter (Fern Glen chert) (Plate 6-8, g). Utilization traces were observed along one straight edge of this piece and consist of small, isolated flake scars and a very narrow band of glossy, smooth polish. This area revealed microwear traces associated with dry hide scraping, including a rough pitted polish extending along the utilized edge in an unbroken band, and a highly rounded edge (Plate 6-8, g, inset).

Table 6-15. Chert Types Utilized at Stemler Bluff.

	Total Assemblage			
Chert Type	n	%	wt. (g)	%
Salem	3,861	33.4	26,032	42.9
Burlington	3,782	32.7	14,615	24.1
Fern Glen	2,526	21.8	14,593	24.0
Ste. Genevieve	861	7.4	2,236	3.6
St. Louis	333	2.8	2,356	3.8
Mill Creek	61	.5	371	.6
Cobden	50	.4	141	.2
Kaolin	52	.4	140	.2
Kincaid	25	.2	140	.2
Elco/Dove	2	.01	6	.01
Total	11,553	99.6	60,630	99.6

Note: Totals based on a sample of 30 features; unidentifiable chert types (n=2,718) are not included.

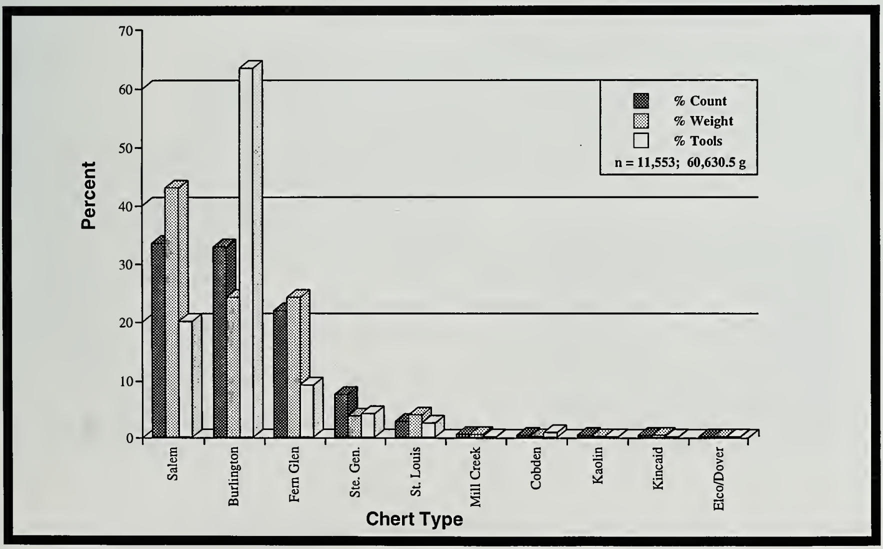

Figure 6-3. Distribution and Frequency of Chert Raw Material.

Table 6-16. Attributes of Microscopically Analyzed Artifacts.

Provenience	Artifact Type	Length	Width	Thickness	Utilized Edge Angle	Raw Material
Feature 23	Block shatter	95.1	34.3	21.6	69°	Burlington chert
Feature 23	Secondary blade	69.0	32.1	10.2	25°	Salem chert
Feature 36	Secondary flake	46.7	34.4	6.1	12°	Burlington chert
Feature 40	Primary flake	62.5	32.8	14.8	36°	Salem chert
Feature 40	Secondary flake	36.2	46.9	7.0	48°	Burlington chert
Feature 42	Secondary flake	53.3	54.4	11.8	58°	Burlington chert (heated)
Feature 128	Block shatter	49.6	48.9	19.3	47°	Fern Glen chert
Feature 129	Secondary flake	23.4	35.4	8.0	43°	Salem chert
Feature 154	Chert cobble	98.7	52.0	43.3	61°	Salem chert

Note: Measurements in mm; edge angle values are means derived from three measurements of utilized edges.

One secondary flake of Salem chert was examined from Feature 129 (Plate 6-8, h). A band of smooth glossy polish is visible along the distal end of this flake. When viewed microscopically, this polished area exhibited a rough, pitted band which extended along the entire distal end of this artifact. Microscopic striations were associated with this polish and were oriented perpendicular to the edge. These traces are consistent with those produced by dry hide scraping.

A large, quadrangular piece of utilized block shatter from Feature 154 was examined (Plate 6-8, i). Visual inspection of this artifact revealed utilization traces on three edges. All three edges exhibited large flake scars, one of which also exhibited a smooth, glossy polish along the entire edge. Finally, one edge has been intensively rounded. Microscopic examination of the utilized edge with the large flake scars and glossy polish revealed a very bright, smooth polish with several striations perpendicular to the edge (Plate 6-8, i). Such wear patterns are the product of repeated contact with soil. The extensive damage along this edge in the form of large flake scars suggests that a great deal of force was exerted during tool use. Based on microscopic and macroscopic evidence, this tool is interpreted to be a hoe, which may have been used for agricultural purposes or pit excavation. Due to the restricted space between the microscope objective and stage, it was not possible to position this large artifact to view the intensively rounded edge. Such rounding or edge attrition is typically associated with hide working, and it is possible that this tool was used for a variety of activities during its use life. Another possible explanation for this edge rounding is that it is the product of hafting. The hoe blade may have been secured to a haft with hide bindings which eventually rounded the tool's lateral edge during use. Such wear patterns will result if the bindings are slightly loose, permitting the blade to move within the haft.

Discussion

Initially it was thought that the smooth, glossy polish observed on these artifacts was a form of "sickle sheen" or "hoe polish" produced through contact with silica-rich plants or soil. Microscopic analysis revealed that this was true of only one artifact, the chert cobble from Feature 154. The remainder of the sample consisted of tools used to scrape dry hide (Table 6-17). None of these artifacts were

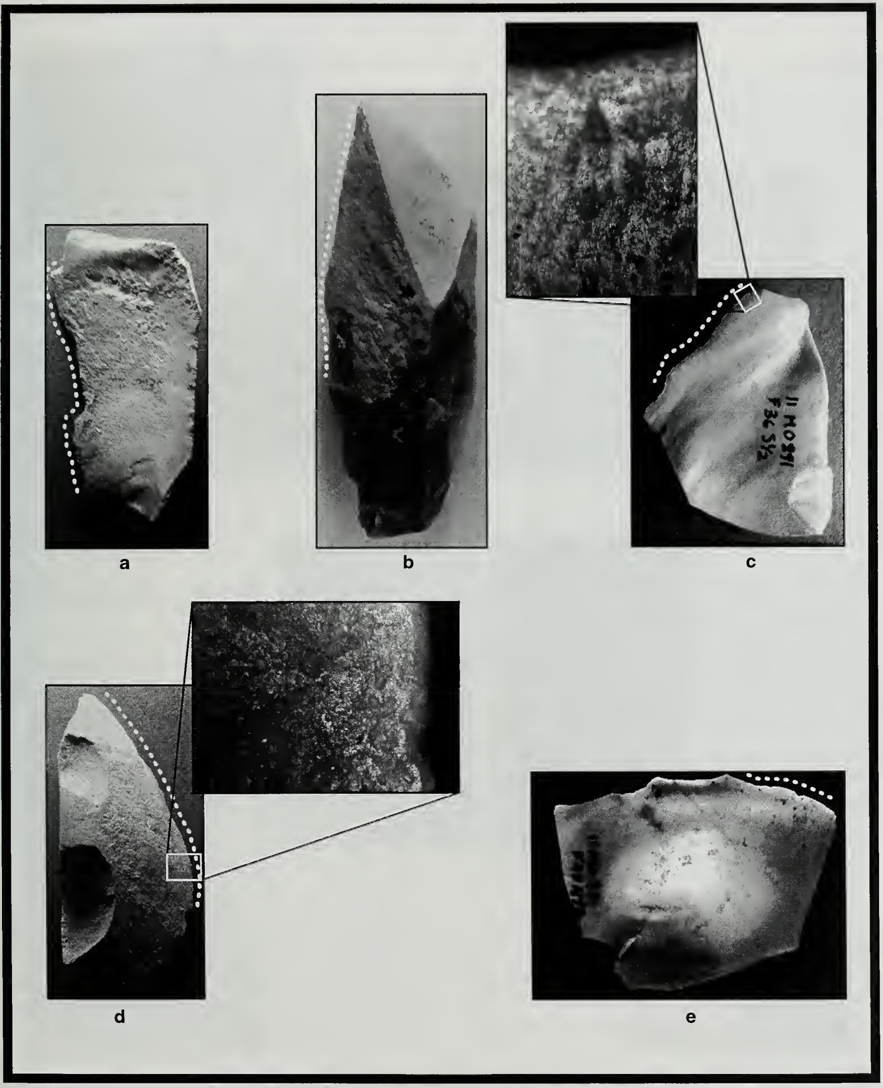

Plate 6-8. Utilized Chert Artifacts Analyzed for Microwear Traces: a, Blade; b, Block Shatter; c, Secondary Flake; d, Primary Flake; e, Secondary Flake.

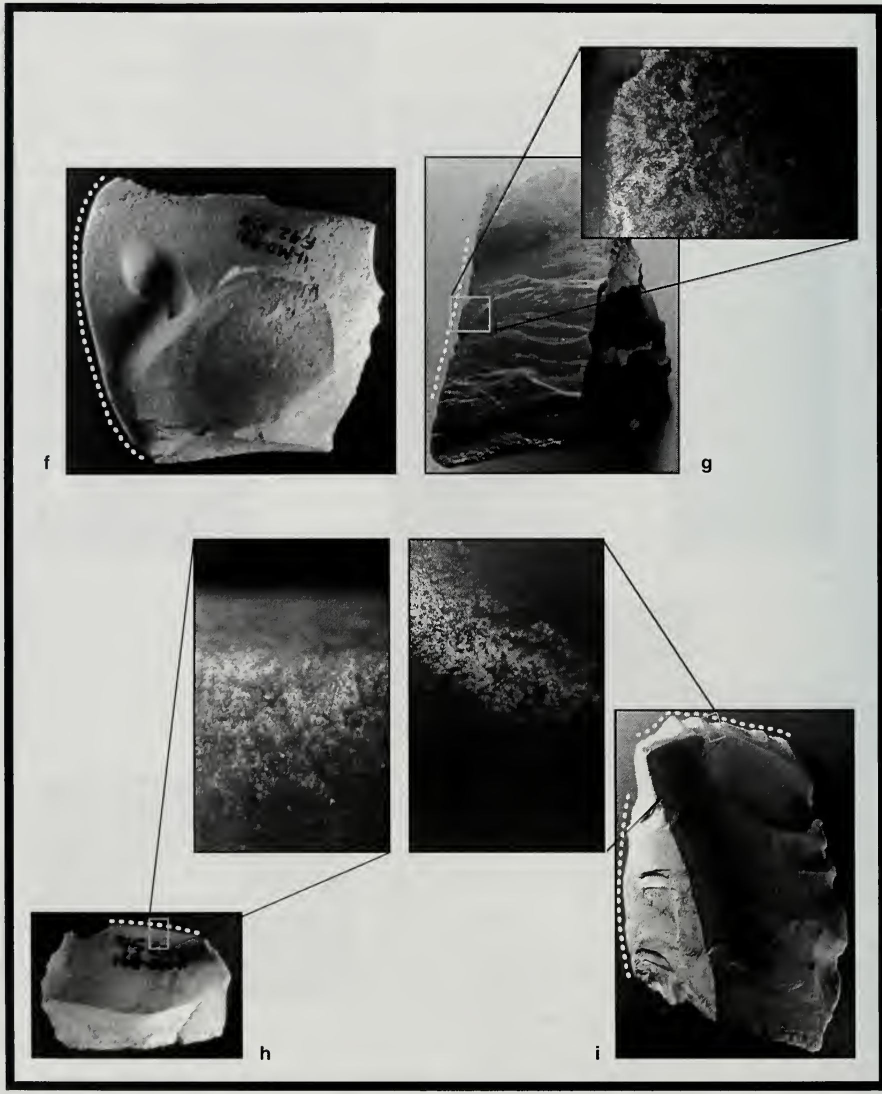

Plate 6-8. Concluded: f, Secondary Flake; g, Block Shatter; h, Secondary Flake; i, Block Shatter.

Table 6-17. Summary of Microwear Analysis of Selected Artifacts.

Artifact Type	Provenience	Function
Utilized blade	Feature 23	Dry hide scraping
Utilized block shatter	Feature 23	Dry hide scraping
Utilized secondary flake	Feature 36	Dry hide scraping
Utilized primary flake	Feature 40	Dry hide scraping
Secondary flake	Feature 40	Dry hide scraping
Utilized secondary flake	Feature 42	Dry hide scraping
Utilized block shatter	Feature 128	Dry hide scraping
Secondary flake	Feature 129	Dry hide scraping
Utilized chert cobble	Feature 154	Hoeing/soil excavation

intentionally shaped tools. Rather, pieces of debitage were selected and used without modification.

As stated above, past excavations in the American Bottom have yielded artifacts exhibiting both high and low gloss. While high gloss can confidently be attributed to contact with soil, the factors accounting for the production of low gloss are uncertain, and interpretations have been based for the most part on speculation. Milner (1983a:83) attributes low gloss to woodworking, excavation, and haft abrasion while Fortier (1985:283) suggests that it is produced by digging, hoeing, or plant cutting. Williams (1990b:461), attributes it to woodworking at Range. However, the microwear analysis of the Stemler Bluff artifacts indicates that it is the product of hide working.

The use-wear analysis indicates that hide processing was one of the activities conducted by the prehistoric inhabitants of Stemler Bluff. While the presence of formally shaped scraping tools suggested that hide working was performed, this could not be demonstrated conclusively, and given the relative paucity of such tools (n=11), would not appear to have been a common activity. The use-wear data suggest the other artifacts classified as "utilized" may also have functioned as hide working tools. Depending on the intensity of use, the wear traces may or may not be visible as a "low gloss." Finally, the importance of hide working is further suggested by the relative abundance of perforators (n=53) which, after bifaces, represent the second most common type of formally shaped chert tools. Such tools may have formed part of a hide working tool kit which also included unmodified flakes and retouched scraping tools.

Summary

The analysis of lithic material from 11MO891 permits several conclusions to be drawn regarding site activities and function and permits comparisons with other contemporary sites in the region. Analysis of the projectile point assemblage reveals that, with the exception of the Paleoindian period, all major prehistoric time periods are represented at the site. As other data from the site indicate that the most intensive occupation dates to the Emergent Mississippian/Mississippian periods, it is likely that point types from earlier periods represent either earlier, ephemeral occupations or artifacts collected by the most recent prehistoric inhabitants of the site.

The abundance of utilized chert debitage and paucity of formally shaped tools, and the abundance of multidirectional and bipolar cores indicate that expedient reduction systems and tool kits were employed. In this respect, Stemler Bluff is typical of contemporaneous sites in the American Bottom region. In addition, use-wear data and the relative abundance of perforating tools indicate that hide processing was an important activity at the site and that this activity was at least in part performed with expedient tools. Artifact production was also another important activity at 11MO891 as is indicated by the abundance of cores, chipping debris, and hammerstones. Other site activities indicated by the lithic material include excavation/cultivation (hoes and hoe flakes), grinding (manos/metates), and abrading (sandstone abraders). Hoes may have been used for cultivation and/or feature excavation while the manos and metates could have functioned to grind foodstuffs such as seeds or corn. The sandstone abraders suggest that tools of perishable material, such as bone, antler, or wood were produced at the site. Artifacts which could have been produced with sandstone abraders include bone needles and awls.

The analysis of a sample of chert artifacts for raw material type indicated that local lithic material available in nearby Dennis Hollow and the adjacent bluffs primarily was utilized. Nonlocal raw materials represent a minor proportion of the analyzed sample and indicate that small quantities of chert were secured from sources between 100 and 170 km southeast of the Stemler Bluff site. The use of Mill Creek chert for hoes is indicated by the 11MO891 assemblage, which again is typical of Emergent Mississippian sites in the American Bottom region.

Few nonutilitarian lithic artifacts were found at Stemler Bluff. Those present include a single stone bead, a calcite pipe bowl fragment, and a few discoidals. As with the mortuary data, this suggests that social stratification was minimal at the site.

In sum, the lithic material suggests that Stemler Bluff was occupied by a relatively egalitarian group involved in a range of activities. The abundance of chert chipping debris indicates that stone artifact production was an important activity at the site. In most respects, 11MO891 fits well within the pattern of lithic raw material utilization observed for other contemporary sites in the American Bottom region.

CHAPTER 7.
PALEOETHNOBOTANICAL ANALYSIS

Archaeological investigations at the Stemler Bluff site resulted in the discovery and excavation of a substantial number of subsurface features dating from the terminal Late Woodland Patrick phase through the subsequent Emergent Mississippian and into the Mississippian period. These features, including single-post-and-basin and wall-trench residential structures, storage and processing pits, and burial and mortuary-related features, provide an excellent opportunity to examine patterns of plant usage in an upland setting during a period of change in both the sociopolitical and subsistence aspects of American Bottom lifeways. The intensive flotation sampling undertaken during the FAI-270 highway mitigation project has provided a detailed and nearly continuous set of archaeobotanical data from sites dating from the Late Archaic through Mississippian periods on the American Bottom and its adjacent upland margins (Johannessen 1984). While representing nearly all cultural phases from the Late Archaic through the Mississippian periods, this archaeobotanical record is heavily weighted toward floodplain sites and assemblages. Analysis of the archaeobotanical remains resulting from this intensive sampling program has allowed for the recognition of a number of temporally sensitive trends in patterns of plant usage and an appreciation of the deepening man-plant relationship through time in this portion of the Mississippi River valley (Johannessen 1984, 1988, 1993; Lopinot 1992).

Botanical remains recovered from archaeological sites offer the researcher a unique class of materials by which the dimensions of man-plant relationships may be explored, both in terms of environmental context and change through time. These remains, however, provide a biased look at the entirety of the man-plant relationship. This bias, the magnitude of which remains unknown and possibly unknowable, is the result of the loss of the majority of plant tissues that were originally present at a site due to rapid decomposition of organic material. Only a small percentage of plant tissues are sufficiently charred and reduced to elemental carbon and then subsequently deposited in a protected context to survive over time. In addition to decomposition via soil fungi and other catabolic avenues, mechanical processes such as fluctuating soil moisture, freeze-thaw cycles, and trampling of exposed plant tissues further limit the amount and type of plant remains preserved in archaeological contexts (Dimbleby 1967). While the recovery of artifacts may give an indication of the broad scope of economic activities undertaken by an archaeologically known group, preserved plant tissues allow a much finer-grained view of the nature of economic pursuits and the cultural choices on which they are dependent. Archaeobotanical materials may provide several types of information of interest to the archaeologist: phylogenetic relationships, usually when domesticated or cultivated plants are involved; data on cultural choice and/or habitat preference; seasonality of plant exploitation and site occupation; and paleoenvironmental reconstructions that are based in part on the types and quantities of preserved plant remains. Some authors, such as Ford (1982:282–295), draw distinctions between *archaeobotany*, the identification of plant remains from archaeological sites and *paleoethnobotany*, which may be regarded as the analysis of plant remains with the goal of describing and interpreting the cultural adaptation to the floral environment and those direct relationships between man and plant. These latter goals are adopted here and form the framework within which the Stemler Bluff botanical assemblage is analyzed and interpreted. There exists, however, no overriding methodology by which paleobotanical remains are sampled and analyzed, largely due to the vagaries of preservation and variation among assemblages.

Methods

During the course of the excavations at Stemler Bluff, systematic collections of feature fill were made for later flotation processing and analysis (see

Chapter 4, volume 1 for detailed methods). Flotation of systematically and volumetrically controlled fill samples provides a means of addressing a number of questions related to subsistence practices and changes in subsistence through time with reference to quantitative data. The laboratory processing and analysis techniques used on the Stemler Bluff archaeobotanical assemblage have been slightly modified from those detailed in Volume 1, Chapter 4. The modifications basically involve the creation of an additional size category, ≥.5mm–≤1.0mm, during the initial sieving of the flotation. This additional sieve category was believed necessary to recover small, economically important seeds that could be present in the Stemler Bluff assemblage. In addition to the collection of the ≥.5mm–≤1.0 mm sieve fraction, the assemblage was characterized by the calculation of additional ratios such as maize fragments/10 liters of processed fill, maize/nutshell, and maize/seeds. These additional ratios permit the analysis of the relative contribution of cultivated plants to the overall diet and may indicate changes in the dietary importance of native and tropical cultigens through time. As such, the additional ratios are not so much changes in the previously discussed methods but additional analytic avenues that arise from the composition of the assemblage at hand.

An additional methodological change was made regarding the analysis of wood charcoal. Owing to the high degree of fragmentation and small size of the wood charcoal pieces from the sampled features at the site, flotation-recovered wood charcoal was not subjected to taxonomic identification. The environmental and topographic setting of the Stemler Bluff site in the oak-hickory forest on the eastern upland margin of the American Bottom, combined with the tendency for human groups to gather firewood from their immediate site environs with as little effort as possible (Asch and Asch 1985b:346), assures that the resultant wood charcoal assemblage will reflect the composition of the immediately accessible forested areas. Wood charcoal identifications were made on all samples submitted for radiometric assay and are presented in the detailed discussion of each of the samples in Chapter 4.

Results

Flotation samples taken from a subsample of features excavated at Stemler Bluff were subjected to detailed paleoethnobotanical analysis and quantification. The features selected for botanical analysis were randomly selected from within the various categories of features present at the site in order that a complete a picture as possible of the nature of plant use at the site could be gained. The spectra of plant remains deposited within different classes of cultural features across the site is expected to reveal variation in both type and quantity of plant remains, as would be expected given the variety of tasks that were potentially associated with the different feature types at the site. The resulting subsample thus includes at least one example of all of the major feature types that were identified at the site with the exception of the several isolated post molds.

A total of 38 features was sampled (Figure 7-1), with 71 individual flotation samples totaling 523 liters of feature fill analyzed. The flotation-recovered archaeobotanical assemblage consists of 32,851 pieces of charcoal ≥2 mm in size. Charred plant remains in the ≥1-mm and ≥2-mm sieve fractions have a total weight of 598.3g. The assemblage is composed of 16,276 pieces of wood charcoal (49.5 percent), 15,175 fragments of charred nutshell (46.2 percent), 539 seeds (1.6 percent), 630 maize cupule and kernel fragments (1.9 percent), and 231 miscellaneous charred plant fragments (.7 percent). The archaeobotanical assemblage is presented by feature type in Tables 7-1 through 7-6, and Tables 7-7 through 7-9 provide summary archaeobotanical measures for the various feature categories sampled. These measures, including charcoal density expressed in grams per 10 liters of processed fill, nut/wood ratios by both count and weight, maize density per 10 liters of fill, and the maize/seed ratio are better indicators of the nature of each of the

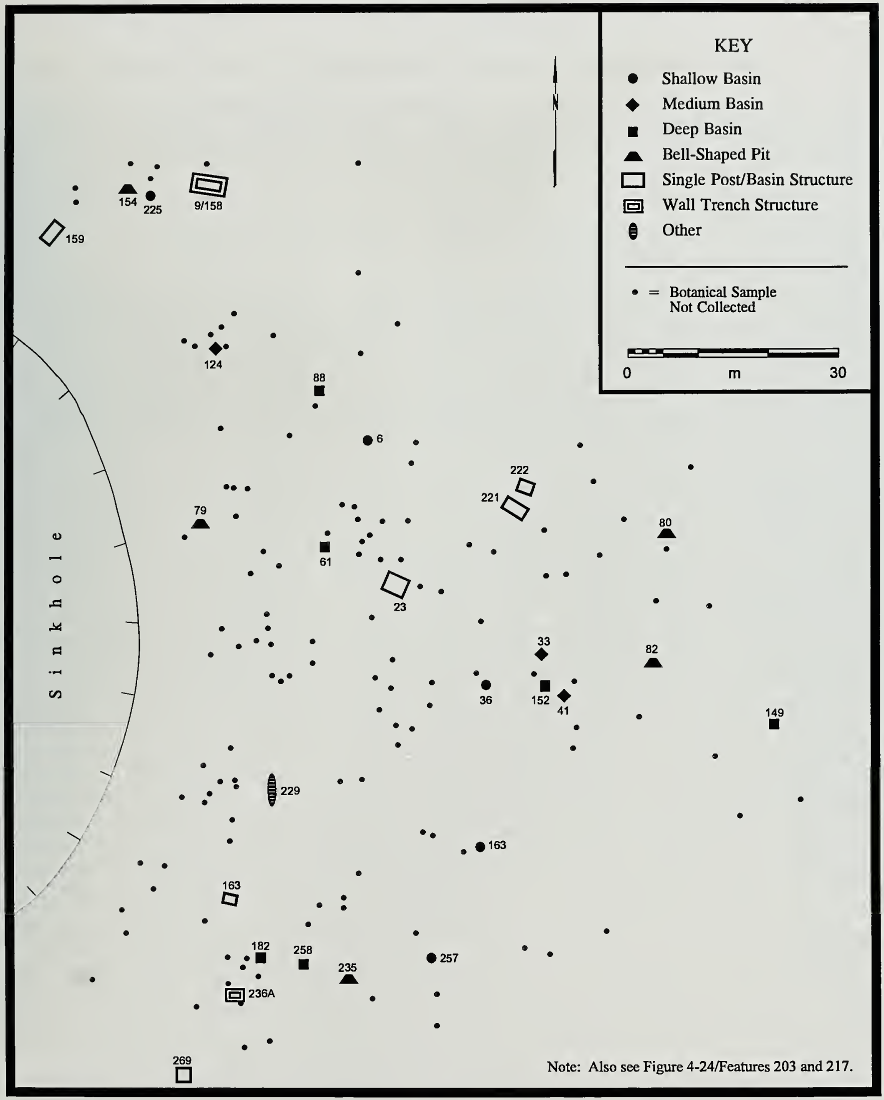

Figure 7-1. Locations of Features from Which Botanical Samples Were Collected.

Table 7-1. Archaeobotanical Remains from Shallow Basin Features.

Taxa	F 6	F 36	F 103	F 163	F 167	F 225	F 257
Samples	1	2	2	1	1	1	1
Volume (liters)	6	16	17	8	6	10	7
Wood							
Total wood ct/wt[a]	459/.9g	629/6.5g g	289/4.8g	420/3.5g	46/.5g	64/1.0g	23/.3g
Nutshell							
Carya illinoensis	1/<.1g	0	0	0	0	0	0
Carya spp.	3/.1g	0	14/.3g	63/1.1g	8/.1g	5/.2g	181/3.5g
Juglans nigra	0	0	0	0	0	0	0
Quercus spp.	0	0	5/.1g	0	0	0	0
Juglandaceae	0	17/.3g	0	0	0	1/<.1g	0
Total nutshell ct/wt[a]	4/.1g	17/.3g	19/.4g	63/1.1g	8/.1g	6/.2g	181/3.5g
Seeds							
Phalaris caroliniana	1	36	3	0	0	0	0
Chenopodium spp.	2	0	4	0	9	0	0
Hordeum pusillum	2	0	3	0	0	0	0
Solanum spp.	0	0	2	0	0	0	0
Scirpus spp.	0	0	0	0	0	0	0
Polygonum erectum	5	0	0	0	1	0	0
Helianthus annuus	0	1	0	0	0	0	0
Portulaca spp.	0	0	0	0	0	0	0
Amaranthus spp.	0	0	0	0	0	0	0
Gramineae	0	0	0	0	0	0	0
Nicotiana spp.	0	0	0	0	0	0	0
Rhus spp.	0	0	0	0	0	0	0
Leguminoseae	0	0	0	0	0	0	0
Nelumbo lutea	0	0	0	0	0	0	0
Rubus spp.	1	0	0	0	0	0	0
unidentified	7	12	15	4	12	1	0
Total seeds	18	49	27	4	22	1	0
Maize							
cupule frags.	7	1	14	0	0	0	0
kernel frags.	5	31	10	0	0	0	0
Total maize	12	32	24	0	0	0	0
Other							
Cucurbit rind	1	0	0	0	0	0	0
Monocot stem	0	0	0	0	0	0	0
unidentified	1	0	19	1	0	0	0
Total Char. ct/wt[a]	495/1.0g	727/13.1g	378/7.7g	488/6.8g	76/1.2g	71/1.6g	204/5.8g

[a]Total weight includes all carbon in ≥1-mm and ≥2-mm sieve fractions.

Table 7-2. Archaeobotanical Remains from Medium and Deep Basin Features.

Taxa	F 33 MB	F 41 MB	F 124 MB	F 61 DB	F 88 DB	F 149 DB	F 152 DB	F 182 DB	F 258 DB
Samples	3	2	1	2	2	1	1	1	1
Volume (liters)	21	17	6	16	15	9	4	8	7
Wood									
Total wood ct/wt	358/3.7g	59/.5g	51/.3g	236/1.8g	199/1.8g	0	0	20/.2g	121/1.2g
Nutshell									
Carya illinoensis	0	0	0	0	0	0	0	0	0
Carya spp.	16/.2g	249/2.9g	4/.1g	43/1.1g	4/.2g	14/.1g	11/.1g	8/.1g	14/.3g
Juglans nigra	0	1/.1g	0	0	0	0	0	0	0
Quercus spp.	0	6/.2g	0	0	1/<.1g	0	0	0	0
Juglandaceae	42/.5g	0	0	0	0	0	0	0	0
Total nutshell	58/.7g	256/3.2g	4/.1g	43/1.1g	5/.2g	14/.1g	11/.1g	8/.1g	14/.3g
Seeds									
Phalaris caroliniana	0	0	0	0	0	0	0	0	6
Chenopodium spp.	0	0	0	4	0	0	0	0	2
Hordeum pusillum	0	0	0	1	0	0	0	0	0
Solanum spp.	0	0	0	0	0	0	0	0	0
Scirpus spp.	0	0	0	0	0	0	0	0	0
Polygonum erectum	0	0	0	20	0	0	0	0	0
Helianthus annuus	0	0	0	0	0	0	0	0	0
Portulaca spp.	0	0	0	0	0	0	0	0	0
Amaranthus spp.	0	0	3	0	0	0	0	0	0
Gramineae	0	1	3	6	0	0	0	0	1
Nicotiana spp.	0	0	0	0	0	0	0	0	0
Rhus spp.	0	0	0	0	0	0	0	0	0
Leguminoseae	0	0	0	2	0	0	0	0	0
Rubus spp.	0	0	0	0	0	0	0	0	0
Nelumbo lutea	0	4	0	0	0	0	0	0	0
unidentified	4	0	0	16	1	0	0	0	8
Total seeds	4	5	6	49	1	0	0	0	17
Maize									
cupule frags.	1	0	0	0	2	0	0	0	2
kernel frags.	15	1	0	0	2	0	0	0	1
Total maize	16	1	0	0	4	0	0	0	3
Other									
Cucurbit rind	0	0	0	0	0	0	0	0	0
Monocot stem	0	0	0	0	0	0	0	0	0
unidentified	4	0	0	0	0	0	0	0	0
Total Char. ct/wt[a]	440/8.9g	321/9.8g	61/.9g	328/14.6g	209/5.5g	14/.4g	11/.2g	80/.7g	155/2.7g

[a]Total weight includes all carbon in ≥1-mm and ≥2-mm sieve fractions.

Table 7-3. Archaeobotanical Remains from Bell-Shaped Pit Features.

Taxa	F 21	F 64	F 79	F 80	F 82	F 154	F 235	F 236B
Samples	5	1	4	3	3	3	3	3
Volume (liters)	34	7	29	23	20	25	19	22
Wood								
Total wood ct/wt	346/4.0g	170/1.9g	370/2.7g	1809/9.1g	106/.8g	591/5.4g	618/6.0g	1026/9.0g
Nutshell								
Carya illinoensis	0	0	0	1/<.1g	0	0	4/.1g	0
Carya spp.	65/1.0g	12/.2g	17/1.0	99/1.7g	22/.3g	27/.3g	11/.4g	23/.8g
Juglans nigra	0	0	0	0	0	0	0	0
Quercus spp.	3/.1g	0	6/.1	0	0	0	4/.1g	22/.1g
Juglandaceae	6/.1g	0	16/.2g	54/.3g	0	0	0	12/.2g
Total nutshell	74/1.2g	12/.2g	39/1.3g	154/2.0g	22/.3g	27/.3g	19/.6g	57/1.1g
Seeds								
Phalaris caroliniana	5	0	9	0	0	47	0	0
Chenopodium spp.	1	8	22	7	0	1	26	0
Hordeum pusillum	1	1	0	0	0	0	0	0
Solanum spp.	0	0	0	1	0	0	0	0
Scirpus spp.	0	0	0	1	0	0	0	0
Polygonum spp.	0	25	0	0	0	1	0	1
Helianthus annuus	0	0	0	0	0	0	0	0
Portulaca spp.	0	0	0	0	1	0	2	0
Amaranthus spp.	0	0	0	0	0	0	0	0
Gramineae	0	0	16	0	0	1	0	0
Nicotiana spp.	0	0	0	0	1	0	1	0
Rhus spp.	0	0	1	0	0	0	0	0
Leguminoseae	0	0	1	0	0	0	0	0
Rubus spp.	0	0	0	0	0	0	0	0
Nelumbo lutea	0	0	0	0	0	0	0	0
unidentified	0	1	14	18	2	2	8	1
Total seeds	7	35	63	27	4	52	37	2
Maize								
cupule frags.	0	0	8	10	1	2	1	4
kernel frags.	0	3	1	23	6	7	2	22
Total maize	0	3	9	33	7	9	3	26
Other								
Cucurbit rind	0	0	0	5	0	0	0	0
Monocot stem	0	0	0	1	0	0	0	0
unidentified	0	0	40	9	0	16	1	12
Total Char. ct/wt[a]	425/9.9g	220/3.1g	521/7.4g	2038/15.3g	139/2.6g	695/9.5g	678/15.5g	1123/16.9g

[a]Total weight includes all carbon in ≥1-mm and ≥2-mm sieve fractions.

Table 7-4. Archaeobotanical Remains from Single-Post-and-Basin Structures.

Taxa	F 23	F 119	F 159	F 177	F 221	F 222	F 269
Samples	1	1	1	1	3	1	1
Volume (liters)	8	6	8	9	22	7	7
Wood							
Total wood ct/wt	121/1.2g	78/.8g	9/.1g	39/.3g	733/7.7g	52/.3g	380/3.6g
Nutshell							
Carya illinoensis	0	0	1/.1g	0	0	0	0
Carya spp.	1/.1g	2/.1g	8/.2g	4/.1g	50/.9g	0	99/1.8g
Juglans nigra	0	0	0	0	0	0	0
Quercus spp.	0	0	0	0	0	0	0
Juglandaceae	5/.1g	0	0	0	0	8/.1g	0
Total nutshell	6/.2g	2/.1g	9/.3g	4/.1g	50/.9g	8/.1g	99/1.8g
Seeds							
Phalaris caroliniana	0	16	1	0	1	0	0
Chenopodium spp.	0	0	1	0	4	0	0
Hordeum pusillum	0	0	0	0	0	0	0
Solanum spp.	0	0	0	0	1	0	0
Scirpus spp.	0	0	0	0	0	0	0
Polygonum erectum	0	0	0	0	0	0	0
Helianthus annuus	0	0	0	0	0	0	0
Portulaca spp.	0	0	0	0	0	0	0
Amaranthus spp.	0	0	0	0	0	0	0
Gramineae	0	0	0	0	0	0	0
Nicotiana spp.	0	0	0	0	0	0	0
Rhus spp.	0	0	0	0	0	0	0
Leguminosae	0	0	0	0	0	0	0
Rubus spp.	0	0	0	0	0	0	0
Nelumbo lutea	0	0	0	0	0	0	0
unidentified	2	1	1	0	1	0	0
Total seeds	2	17	3	0	7	0	0
Maize							
cupule frags.	2	0	0	0	12	0	0
kernel frags.	0	7	2	0	39	4	0
Total maize	2	7	2	0	51	4	0
Other							
Cucurbit rind	0	0	0	0	0	0	0
Monocot stem	0	0	0	0	0	0	0
unidentified	0	0	0	0	1	0	0
Total Char. ct/wt[a]	131/1.9g	104/2.8g	23/.8g	43/.7g	842/14.3g	64/1.2g	479/8.9g

[a]Total weight includes all carbon in ≥1- mm and ≥2-mm sieve fractions.

Table 7-5. Archaeobotanical Remains from Wall-Trench Structures and Mortuary Features.

Taxa	F 9/158-WT	F 96-WT	F 236A-WT	F 203-M	F 217-M
Samples	4	1	3	1	1
Volume (liters)	38	6	18	5	8
Wood					
Total wood ct/wt	5240/39.4g	273/2.3g	185/1.9g	378/3.1g	292/3.0g
Nutshell					
Carya illinoensis	12/.3g	0	0	0	0
Carya spp.	13,816/229.9g	0	10/.4g	0	0
Juglans nigra	0	0	0	0	0
Quercus spp.	3/<.1g	0	1/<.1g	0	0
Juglandaceae	0	0	5/0.2g	0	0
Total nutshell	13,831/257.0g	0	16/.6g	0	0
Seeds					
Phalaris caroliniana	3	0	0	0	0
Chenopodium spp.	1	0	10	0	0
Hordeum pusillum	0	0	0	0	0
Solanum spp.	2	0	0	0	0
Scirpus spp.	2	0	0	0	0
Polygonum erectum	0	0	1	0	8
Helianthus annuus	0	0	0	0	0
Portulaca spp.	1	0	0	0	0
Amaranthus spp.	0	0	0	0	0
Gramineae	2	0	0	0	0
Nicotiana spp.	0	0	0	0	0
Rhus spp.	0	0	0	0	0
Leguminosae	0	0	0	0	0
Rubus spp.	0	0	0	0	0
Nelumbo lutea	0	0	9	0	0
unidentified	12	0	6	0	0
Total seeds	23	0	27	0	8
Maize					
cupule frags.	321	0	3	0	0
kernel frags.	3	4	5	0	0
Total maize	324	4	8	0	0
Other					
Cucurbit rind	2	0	2	0	0
Monocot stem	31	0	0	0	0
unidentified	73	0	9	0	0
Total Char. ct/wt[a]	19,689/381.5g	277/3.9g	247/4.9g	378/5.5g	300/4.2g

[a]Total weight includes all carbon in ≥1-mm and ≥2-mm sieve fractions.

Table 7-6. Archaeobotanical Remains from Miscellaneous Features.

Taxa	F 151	F 229
Samples	1	3
Volume (liters)	6	23
Wood		
Total wood ct/wt	3/.1g	303/2.0g
Nutshell		
Carya illinoensis	0	0
Carya spp.	1/.1g	12/.2g
Juglans nigra	0	0
Quercus spp.	0	0
Juglandaceae	0	22/.4g
Total nutshell	1/.1g	34/.6g
Seeds		
Phalaris caroliniana	0	6
Chenopodium spp.	0	0
Hordeum pusillum	0	0
Solanum spp.	0	0
Scirpus spp.	0	0
Polygonum erectum	0	0
Helianthus annuus	0	0
Portulaca spp.	0	0
Amaranthus spp.	0	2
Gramineae	0	0
Nicotiana spp.	0	0
Rhus spp.	0	0
Leguminoseae	0	0
Rubus spp.	0	0
Nelumbo lutea	0	0
unidentified	0	2
Total seeds	0	10
Maize		
cupule frags.	0	0
kernel frags.	0	10
Total maize	0	10
Other		
Cucurbit rind	0	1
Monocot stem	0	0
unidentified	0	0
Total Char. ct/wt[a]	4/.4g	358/6.7g

[a]Total weight includes all carbon in ≥1-mm and ≥2-mm sieve fractions.

Table 7-7. Summary Archaeobotanical Statistics for Basin Features.

Feature Type	Charcoal Density grams/10 liters	Nut/wood ratios by ct. and wt.	Maize density Fragments/10 liters	Maize fragments/ seeds
Shallow Basins				
Feature 6	1.67	.01/.1	20	.67
Feature 36	8.2	.03/.05	n/a	n/a
Feature 103	4.5	.07/.08	14.1	.89
Feature 163	8.5	.05/.31	n/a	n/a
Feature 167	2.0	.17/.20	n/a	n/a
Feature 225	1.6	.09/.2	n/a	n/a
Feature 257	8.3	7.9/11.7	n/a	n/a
Medium basins				
Feature 33	4.2	.16/.19	1.9	4.0
Feature 41	5.8	4.3/6.4	.6	.2
Feature 124	1.5	.08/.33	n/a	n/a
Deep Basins				
Feature 88	3.7	.3/.11	2.7	4.0
Feature 149	.4	n/a	n/a	n/a
Feature 152	.5	n/a	n/a	n/a
Feature 182	.9	.40/.50	45	2.57
Feature 258	3.9	.12/.25	4.3	.18

Table 7-8. Summary Archaeobotanical Statistics for Bell-Shaped Pits and Mortuary and Miscellaneous Features.

Feature Type	Charcoal density grams/10 liters	Nut/wood ratios by ct. and wt.	Maize density fragments/10 liters	Maize fragments/ seeds
Bell-Shaped Pits				
Feature 21	2.9	.21/.3	n/a	n/a
Feature 64	4.4	.07/.1	50	.09
Feature 79	2.6	.11/.48	3.1	.14
Feature 80	6.7	.09/.22	14.3	1.2
Feature 82	1.3	.21/.38	3.5	1.75
Feature 154	3.8	.05/.06	3.6	.17
Feature 235	8.2	.03/.1	1.6	.08
Feature 236B	7.7	.06/.12	11.8	13
Mortuary Features				
Feature 203	11.0	n/a	n/a	n/a
Feature 217	5.3	n/a	n/a	n/a
Miscellaneous				
Feature 151	.7	.33/1.0	n/a	n/a
Feature 229	2.0	.11/.03	4.3	1

Table 7-9. Summary Archaeobotanical Statistics for Structural Features.

Feature Type	Charcoal Density grams/10 liters	Nut/wood ratios by ct. and wt.	Maize density fragments/10 liters	Maize fragments/ seeds
Single-Post-and-Basin Structures				
Feature 23	2.4	.05/.17	n/a	n/a
Feature 119	4.7	.03/.13	11.7	.41
Feature 159	1.0	1.0/3.0	2.5	.67
Feature 177	2.2	.10/.33	n/a	n/a
Feature 221	6.5	.07/.12	23.2	7.29
Feature 222	1.7	.15/.67	5.7	n/a
Feature 269	12.7	.26/.50	n/a	n/a
Wall-Trench Structures				
Feature 9/158	100.4	2.55/6.5	85.3	14
Feature 96	6.5	n/a	6.7	n/a
Feature 236A	2.7	.09/.32	4.4	.30

sampled contexts than simple counts and weights of the material. Each of the various categories of archaeobotanical remains are discussed below by category.

Wood Charcoal

Wood charcoal constitutes 49.5 percent of the total archaeobotanical assemblage by count (n=16,276) and 21.6 percent by weight. Wood charcoal was recovered in the ≥2- mm sieve fractions from 36 of the sampled features, yielding a ubiquity rating of 94.7. Ubiquity, or percent presence, is a measure of the distribution of a particular class of remains within the overall assemblage independent of its absolute count and independent of all other classes of material (Popper 1988). The two samples that did not produce any wood charcoal ≥2 mm in size, Features149 and 152, are both deep basins. As illustrated in Tables 7-1 through 7-6, wood charcoal counts and weights are quite variable within each of the sampled feature classes. Feature 9/158, a burned wall-trench structure, produced the greatest amount of wood charcoal in any of the sampled features in both absolute count and weight and in terms of density (1,426 fragments per 10 liters of fill). In general, the wood charcoal portion of the assemblage was found to be relatively poorly preserved and very fragmentary. This is likely due to the secondary deposition of much of the wood charcoal.

Nutshell

Charred nutshell accounts for 46.2 percent of the overall assemblage by count (n=15,157), 47.6 percent by weight, and has a ubiquity rating of 92.1. The distribution of the nutshell, however, is far different from what one might expect given its ubiquity among sampled features. Fully 91.1 percent of all nutshell recovered at Stemler Bluff was recovered from a single feature, Feature 9/158, the burned Mississippian wall-trench structure. The other features that produced nutshell contained only small amounts mixed in with wood charcoal and other charred plant remains. Thick-shelled varieties of hickory dominate the assemblage (n=14,916, 98.3 percent), followed by indeterminate Juglandaceae (walnut family) nutshell, much of which is likely thick-shelled hickory, (n=188, 1.2 percent), acorn (*Quercus* spp.) fragments (n=51, .34 percent), thin-shelled pecan hickory (*Carya illinoensis*) (n=19, .13 percent), and finally black walnut (*Juglans nigra*) (n=1, .01 percent). The predominance of hickory nut in the assemblage is not unexpected given the location of Stemler Bluff in the upland margin oak-hickory forest zone and the long-term utilization of hickory nuts by aboriginal populations in the midcontinent. While the relative importance of nuts in the overall subsistence base has been shown to decline in the American Bottom (Johannessen 1984, 1993) following the intensification of horticultural production and later adoption of maize agriculture beginning during the Emergent Mississippian, nuts may have continued to be an important secondary resource in times of poor agricultural production. The location of the site in the forested uplands where nut crops would be readily and easily collected also could indicate that despite the general reduction in the importance of nutshell among late prehistoric agriculturalists, such resources were opportunistically exploited by upland populations with greater regularity owing to their proximity.

Seeds

A total of 539 charred seeds or seed fragments was recovered from flotation samples. The taxa represented and quantities recovered are summarized in Tables 7-1 through 7-6. In addition to unidentified seeds that were too badly charred or fragmentary for accurate identification (n=155, 28.7 percent), 384 seeds were identified in 15 named taxa including two families, eight genera, and five species. Four of the identified seed taxa, *Chenopodium* spp., *Phalaris caroliniana*, *Polygonum erectum*, and *Hordeum pusillum* represent native plants cultivated for their edible seeds within an indigenous horticultural system. Each of the taxa recovered will be discussed separately below.

The 155 unidentified seeds and seed fragments comprise the largest percentage of the seed assemblage recovered from the analyzed samples, 28.7 percent. Seeds within the unidentified category likely represent a number of different taxa but were too badly deformed or fragmentary to permit accurate identification. These unidentified seeds potentially represent both incidental inclusions within the feature fills or the remains of plants, both cultivated and wild, that formed part of the subsistence base of the site's occupants.

A total of 133 seeds was identified as those of *Phalaris caroliniana* or maygrass, a native annual grass that thrives in disturbed habitats and produces seed in the late spring or early summer (Montgomery 1977). Maygrass comprises 24.7 percent of the seeds assemblage and has a ubiquity rating of 31.6. The starchy seeds of maygrass have been recovered in numerous archaeological contexts throughout the midcontinent, and the plant is a component of an aboriginal horticultural complex (Asch and Asch 1985a; Ford 1985; Watson 1974; Yarnell 1964). In west-central Illinois, maygrass becomes common in sites younger than 2,000 years old, suggesting a major change in the economic status of this plant occurred during the Middle Woodland period (Asch and Asch 1985a). Maygrass is found frequently in sites on the American Bottom from the Middle Woodland through Mississippian periods (Johannessen 1984, 1993; Lopinot 1992; Rindos and Johannessen 1991) where it is both an important component of pre-maize horticultural systems and later Mississippian agricultural systems. The archaeological distribution of maygrass extends considerably northward of its modern, more southerly distribution (Hitchcock 1950), suggesting that human intervention and cultivation extended its range during prehistory.

A total of 104 seeds was identified as *Chenopodium* or goosefoot, a native annual that also is considered to have been a component of a native horticultural system (Asch and Asch 1985a; Ford 1985; Smith 1987). Goosefoot comprises 19.3 percent of the seeds recovered at Stemler Bluff and has a ubiquity rating of 39.5. Asch and Asch (1985a) attribute archaeological specimens of chenopod to the species *Chenopodium berlandieri* on morphological grounds. The specimens recovered from Stemler Bluff, while considerably deformed and altered due to the effects of charring, may belong to this taxa, but their condition does not permit a certain attribution to species. Chenopod seeds would have been available for harvest in the autumn. Chenopod was an important component of the subsistence base on the American Bottom beginning in the Middle Woodland period and remained a part of the subsistence base throughout the Mississippian period (Johannessen 1984, 1993).

A small number (n=8) of seeds were identified as *Hordeum pusillum* or little barley. Little barley is another of the native annuals that comprise a pre-maize horticultural complex in eastern North America (Asch and Asch 1985a). Little barley represents only 1.5 percent of the total seed assemblage recovered at 11MO891 and has a low ubiquity rating of 13.2. Like maygrass, little barley produces seed during the early summer rather than the fall, but several weeks later than maygrass (Asch and Asch 1985a:193). At this time of the year, no other cultivated plant foods would be available unless sufficient quantities had been stored for later consumption.

Of the seeds recovered at Stemler Bluff, 12.2 percent (n=66) are identified as *Polygonum erectum* or knotweed. Knotweed has a ubiquity rating of 12.2. Knotweed is another of the native plants that has a long history of human cultivation and harvest prior to the introduction of maize agriculture in the midcontinent (Asch and Asch 1985a; Ford 1985; Watson 1985). Knotweed ripens in the fall and would have been available at the same time as goosefoot (*Chenopodium*). Both knotweed and goosefoot, along with the maygrass and little barley were likely grown in garden plots by the site's occupants.

Helianthus annuus or common sunflower has a single recorded occurrence at 11MO891 and accounts for a mere .2 percent of the seed assemblage. With a single occurrence, the ubiquity rating for sunflower is a low 2.6. Sunflower also has a long record of utilization in eastern North American archaeological sites (Asch and Asch 1985a; Ford 1985; Watson 1974, 1985; Yarnell 1964) where it became a component of the native horticultural system following its introduction from the southwest. In contrast to the other members of this group recovered at Stemler Bluff, knotweed, maygrass, goosefoot, and little barley, sunflower seeds are valued for their oil content rather than their starch content. Given the single occurrence of sunflower, little more may be said regarding its utilization or importance at the site.

Thirteen seed fragments were identified as the nutlets of *Nelumbo lutea*, the American lotus, an aquatic plant similar to the more common water lily. These comprise 2.4 percent of the assemblage and have a ubiquity rating of 5.3. The hard-shelled seeds of the American lotus ripen in the fall within large seed pods. The American lotus is abundant along the Mississippi and Illinois rivers (Winterringer and Lopinot 1966). Both the nutlets and starchy tubers of the American lotus were exploited by aboriginal populations as food resources (Havard 1895; Walz 1992;Yarnell 1964).

Seven seeds were identified as *Solanum* spp. or nightshade. These seeds account for 1.3 percent of the assemblage and have a ubiquity rating of 10.5. Nightshade favors disturbed soils and habitats and the unripe berries are considered poisonous to humans (University of Illinois Agricultural Experiment Station [UIAES] 1960). Nightshade seeds have been recovered from sites in the American Bottom (Johannessen 1984) as well as other areas in the midcontinent (Asch and Asch 1985b). Recently, Parker (1996) reported on a concentration of 560 nightshade seeds recovered from a feature in association with a large number of tobacco seeds from a Late Woodland site, 20SA1034, located in the Saginaw valley in eastern Michigan. The co-occurrence of tobacco and nightshade seeds suggests that a portion of the nightshade plant may have been incorporated into aboriginal smoking mixtures, used in medicinal preparations, or consumed as food (Parker 1996:318–323). It is also possible that the nightshade's adventive character led to its becoming a common weed in gardens and fields whose presence in archaeological sites is simply fortuitous.

Seeds identified as *Scirpus* spp. (n=3, .6 percent) were infrequent at Stemler Bluff with a ubiquity rating of 5.3. Members of the genus *Scirpus* such as the bulrush, *Scirpus americanus*, are widely distributed throughout Illinois in moist areas along lake, river, and pond margins (Jones 1963; Winterringer and Lopinot 1966). While there is no documented subsistence use for *Scirpus* seeds, the stems of a number of rushes were commonly used in weaving mats or baskets in many areas of North America (Yarnell 1964). The presence of these seeds in the assemblage is likely incidental and may reflect the use of rushes as tinder, in weaving, or as thatching material to be used in structures.

Five seeds (.9 percent) were identified as *Portulaca* spp. or purslane. *Portulaca* has a ubiquity rating of 10.5. Purslanes are low, drought-resistant, ground-cover type plants with succulent stems and leaves (UIAES 1960). Purslanes thrive on disturbed soils, and the presence of seeds of this plant within the sampled feature fills may be incidental. This taxa has been identified previously in the American Bottom (Johannessen 1993).

Pigweed or amaranth, *Amaranthus* spp. is a weedy annual that thrives in disturbed habitats. Five charred amaranth seeds (.9 percent, ubiquity 5.3) were recovered at Stemler Bluff. The presence of this taxa likely reflects incidental inclusion.

The genus *Rhus* includes a number of varieties of sumac as well as poison ivy (Batson 1977; Jones 1963). A single seed (.2 percent) identified as *Rhus* was recovered at 11MO891. Several of the sumacs, including *Rhus typhina* (staghorn sumac), *Rhus glabra* (smooth sumac), and *Rhus aromatica* (fragrant sumac), were used as smoking materials by some eastern aboriginal groups. The fruits of staghorn sumac also were used in making beverages, dyes, and medicinal preparations (Yarnell 1964). The single seed recovered from the site makes any interpretation of its presence purely speculative.

A single seed was identified as *Rubus*. The genus includes several species of both raspberries and blackberries (Bergen 1908) which generally are available during the late summer months in much of North America. Raspberries and blackberries represent a wild resource that could either be directly consumed or stored in a dried state for later consumption (Yarnell 1964).

Two seeds of tobacco were recovered from the flotation samples. Identification of the tobacco beyond the genus level, *Nicotiana*, is difficult on morphological grounds. It is probable, however, that archaeological specimens represent *N. rustica*, a species with a long history of cultivation and likely of South American origin. Tobacco initially appears on the American Bottom during the Late Woodland period and is present, though generally in small amounts, throughout the succeeding Emergent Mississippian and Mississippian periods (Johannessen 1984). Tobacco was widely cultivated in eastern North America at historic contact for smoking and ritual uses (Gilmore 1977; Turnbaugh 1975).

In all, 32 seeds or seed fragments were identified as members of the grass family, Gramineae. These seeds, more properly caryopses, were too fragmentary or charred for further identification. A number of grasses would have been expected to inhabit both the floodplain and uplands in the immediate site location. These seeds may represent accidental inclusions gathered with wild or cultivated plants, intentionally collected plants to be used for subsistence, the result of seeds deposited from grasses used for technological purposes, or simply incorporations into archaeological deposits by natural seed dispersal mechanisms.

The Leguminosea or bean family is one of the largest of the flowering plant families with 600 genera (Smith 1977). Common legumes include such diverse taxa as *Gleditsia* or honey locust, *Robinia* or black locust, *lespedeza* or bush clovers, *Stropohostyles* or the wild bean, and *Phaseolus* a genus that includes the cultivated common bean (Bergen 1908). The common bean, *Phaseolus vulgaris*, was introduced into eastern North America fairly late in prehistory, around A.D. 1000 but was never a major subsistence item in the American Bottom or upper Mississippi River valley until after A.D. 1250. This lack of significant archaeological presence is in contrast to the apparent heavy use of beans by Fort Ancient populations in the Ohio valley (Asch and Asch 1975; Lopinot 1992; Wagner 1986).

Fragmentary maize kernels (n=226) and cupules (n=404) comprise 1.9 percent of the total archaeobotanical assemblage recovered at Stemler Bluff. Maize cupules, the portion of the cob that contains the kernels, have a ubiquity rating of 42.1 while kernels have a higher ubiquity of 57.9. All maize remains recovered from the site belong to the species *Zea mays* and represent the result of the diffusion of this tropical cultigen into North America (Galinat 1985). Due to the highly fragmentary nature of the maize remains, further analysis of the morphology of the kernels and cupules which allows estimation of row number was not possible. While the presence of small amounts of maize has been documented in portions of eastern North America, including the American Bottom, as early as 2000 B.P. (Chapman and Crites 1987; Riley and Walz 1992; Riley et al. 1994; Scarry 1990), nearly all researchers agree that maize did not become a dietary staple until A.D. 750–800 or later (Johannessen 1984, 1993; Fritz 1992, 1993). In the American Bottom, maize appears in quantity very abruptly during the Emergent Mississippian period where it is present in about 50 percent of analyzed flotation samples (Johannessen 1984). The rapid appearance and widespread distribution of maize during the eighth and ninth centuries A.D. in the American Bottom along with the continued presence of the various starchy-seeded native plants in archaeobotanical assemblages dating to this time suggests that maize was readily incorporated into an existing horticultural system (Lopinot 1992).

In addition to the above described plant remains, a small number of other fragments also were identified including squash rind and monocot or grass stem. Eleven small fragments of squash or *Cucurbita* rind were recovered. Squash or gourd has a long history of cultivation in North America dating well back into the Archaic period. The dried fruits of this plant may be used as containers and the seeds are edible (Asch and Asch 1985a; Kay et al. 1980; King 1985; Watson 1985). Also identified were 32 fragments of monocot or grass stem. These items may represent kindling or thatch.

Discussion

The general trends evident in the Woodland, Emergent Mississippian and Mississippian archaeobotanical assemblages from the American Bottom region that were generated from the FAI-270 archaeological mitigation project form the interpretive framework within which to consider the Stemler Bluff archaeobotanical assemblage. These developmental trends, their archaeological timing, and cultural significance are briefly summarized below.

Archaeobotanical assemblages from the American Bottom dating to the Middle Woodland period, ca. 2100–1650 B.P., reveal subtle but important shifts in composition with respect to earlier assemblages. Most notable during the Middle Woodland period is an increase in the frequency of seeds and a concomitant decrease in the frequency of nutshell in the sampled archaeobotanical assemblages. The growing frequency of seeds, primarily those of three starchy-seeded taxa—*Chenopodium berlandieri* (chenopod or goosefoot), *Phalaris caroliniana* (maygrass), and *Polygonum erectum* (erect knotweed)—during this period is taken as an indication of the introduction of horticulture or gardening focusing on herbaceous annuals as a replacement for gathered plant foods such as nuts and other wild plants. In addition, wood charcoal assemblages also indicate a change in composition during the Middle Woodland period. Specifically, floodplain taxa decrease in frequency and are replaced by increasing amounts of upland taxa such as oak and hickory which would be readily available in the flanking uplands and bluff slopes. Maize has been dated by the Accelerator Mass Spectrometry (AMS) technique to the Middle Woodland period at the Holding site, 11MS128, on the American Bottom (Riley and Walz 1992; Riley et al. 1994), but is not considered to have played a major role in the subsistence base at this time. Instead, the presence of small amounts of maize may reflect its presence as a special status or ritual item during the Middle Woodland period. The succeeding Late Woodland period, 1650–1150 B.P., shows a continuation of the trends noted in the Middle Woodland. Starchy-seeded plants, likely cultivated in garden plots located adjacent to habitation areas, continue to grow in importance, and nutshell continues to drop in frequency. The growing frequency of the starchy-seeded taxa and the decline in nuts has been taken as an indication of the growing emphasis on horticultural production in the overall subsistence base. While declining in overall importance, hickory nutshell dominates the nutshell assemblage, suggesting that the uplands were the source of most nut gathering activity. Two plants, squash (*Cucurbita pepo*) and tobacco (*Nicotiana rustica*), make their initial appearance in archaeobotanical assemblages from the American Bottom region during the Late Woodland period. Both squash and tobacco, however, are present in small quantities, and, given the divergent contexts of their use, may be under represented in archaeobotanical samples. Maize is again present in small amounts in some Late Woodland assemblages but is again not considered to be a major component of the Late Woodland diet in the southern American Bottom.

The Emergent Mississippian period, 1150–950 B.P. in the southern American Bottom, 1250–950 B.P. in the north, witnesses the abrupt, widespread appearance of maize in American Bottom archaeobotanical assemblages where it is present in over 50 percent of analyzed samples. This abrupt appearance of maize around A.D. 750 is not accompanied by a decrease in starchy seeds, however, and chenopod, maygrass, and erect knotweed continue to be important components of the sampled assemblages. In addition to the above noted starchy-seeded plant taxa, other potential cultivars present in Late Woodland assemblages include, sunflower (*Helianthus annuus*), wild bean (*Strophostyles helviola*), sumac (*Rhus* spp.), and nightshade (*Solanum* spp.). Nutshell continues to comprise a smaller portion of the total assemblage, with hickory remaining the most common nut taxa represented. Acorn (*Quercus* spp.), however, increases dramatically in its presence, possibly an indication of intensive collecting of the uplands where both hickory and acorn are common. The succeeding Mississippian period, 950–550 B.P., does not show significant divergence from the preceding Emergent Mississippian period in terms of the archaeobotanical assemblage. Maize is well-represented along with the previously documented starchy-seeded cultivars, and a number of wild plant taxa are present that are indicative of gathering or collecting. The manner in which maize was cultivated, however, may undergo significant intensification with the beginning of the Mississippian period. This intensification likely includes the clearing, planting, and cultivation of large floodplain fields on a communal basis in addition to the continued planting of maize in small residential garden plots along with the suite of native cultigens. The location of dispersed Mississippian farmsteads on floodplain ridges has been interpreted as evidence that such a two-tiered planting system was in place during this time (Woods 1987).

The shift from gardening to more intensive field-based cultivation may at initial glance also be taken as the dividing line between horticulture or small-scale gardening and true field agriculture. This dichotomy, however, clouds the gradual and incremental development of Mississippian agricultural systems from the tradition of plant manipulation and cultivation that developed for thousands of years in eastern North America. Rindos (1984) describes agriculture and its development in evolutionary terms that account for selective change in both targeted plant taxa and the behaviors of human groups that manipulate plants. This approach leads to a distinction between *horticulture*, defined as an early stage of agriculture in which particular plant species become domesticated through experimental interaction and protection by human groups, and *agriculture*, which is described as environmental manipulation within the coevolutionary relationship established between man and plant. The protective aspect of horticultural systems includes both the physical protection of the target species as well as the sociocultural protection derived through the development of rituals and taboos associated with these plants. This protection of certain plant taxa may then lead to selective pressures that lead to domestication. Agriculture is conceptualized as involving not only the protection and selective forces of the horticultural system, but is based on the patterned manipulation of the local environment. Agriculture, however, is not a specific type of environmental adaptation but a form of man-plant relationship that has taken a number of forms and developmental trajectories in various environmental and cultural contexts (Rindos 1984:99–101). This evolutionary perspective also effectively removes the issue of human intentionality from the discussion of the development of agricultural systems, and instead relies on the concept of a coevolutionary trajectory within which both the biological requirements and characteristics of the plants, and the learned, culturally transmitted behaviors of the human groups are transformed as result of their interactions through time.

Within the context of the American Bottom, such an coevolutionary trajectory is underway at least as early as the Middle Woodland period, if not by the Late Archaic, with the increasing focus on native starchy-seeded annuals as dietary components. By the Mississippian period, the agricultural threshold clearly has been achieved with the clearing and planting of bottomland maize fields. Maize is an agricultural domesticate that requires not only human intervention during the entirety of its life cycle but specialized environmental parameters and human behaviors (Rindos and Johannessen 1991:40–42). It is not the rapid and widespread introduction and incorporation of maize into the subsistence base during the period between A.D. 750 and 1000 that defines Mississippian agricultural systems, but the long-term effectiveness of the indigenous agricultural system that allowed its rapid adoption and incorporation into an existing set of culturally transmitted beliefs and behaviors.

In summary, the existing archaeobotanical assemblages generated for the American Bottom and its immediate upland margins indicate that horticultural activities such as gardening are well in place for at least a 500-year period prior to the widespread introduction of maize during the Emergent Mississippian period ca. A.D. 750–800. The pattern that emerges is one of continued intensification in horticultural activities that culminate in the fully agricultural Mississippian period, and one that correlates with a general decline in the role of gathered plant foods through time. The intensifications in horticulture and later agricultural production are likely due in part to both growing sociopolitical complexity and increasing population density on the American Bottom floodplain. The abrupt and widespread appearance of maize during the Emergent Mississippian period may be due, in part, to the long-term reliance on gardening and plant husbandry focused on the starchy-seeded native cultivars and to growing degrees of human impact on the natural environment which may be important preconditions to the rapid adoption of maize agriculture (e.g., Rindos 1984). The early appearance of maize in very small quantities on the American Bottom floodplain during the Middle Woodland period suggests that while this plant was not an important subsistence item during the Middle and Late Woodland, it was also not wholly unknown in a horticultural context, a situation which may also have led to its rapid and widespread appearance in the Emergent Mississippian period. Also of importance is the addition of maize to the existing horticultural complex, the components of which remain important in the subsistence base, rather than its introduction as a replacement for a previously cultivated plant taxa (Johannessen 1984, 1988; Lopinot 1992; Rindos and Johannessen 1991).

The Stemler Bluff archaeobotanical assemblage compares favorably with the general view of Emergent Mississippian and Mississippian period subsistence within the American Bottom region in a number of respects although there are also conspicuous differences in the relative quantities of some remains such as nutshell. First, both a suite of starchy-seeded native taxa including maygrass, chenopod, knotweed, and little barley, and maize are present and fairly well-distributed among the sampled features. These starchy-seeded taxa represent native cultigens that were most likely husbanded in small garden plots with little intervention other than sowing and harvesting. Seed density at the site, however, is quite low, with only 1.03 seeds per liter of floated sediment. This low seed density is similar to that of the Mississippian component at the Esterlein site, a short-term Mississippian farmstead located on the floodplain in the northern portion of the American Bottom (Dunavan 1990). In contrast to the low seed density, nutshell, which accounts for 46.2 percent of the total archaeobotanical assemblage, is well-represented at the site. This abundance of nutshell, however, is due almost entirely to a single feature, 9/158, which contained 91 percent of all nutshell recovered from the site and has a nutshell density of over 3,639 fragments per 10 liters of analyzed sediments.

Feature 9/158 is a burned Mississippian wall-trench structure with a conventional radiocarbon age of 1010±60 B.P. The large quantity of charred hickory nutshell recovered from this feature, along with the lack of any charred nutmeats within the flotation samples, suggests that the nutshell may represent processing residues that were retained within the structure for later use as fuel. At any rate, the enormous quantity of charred nutshell in this Mississippian structure is indicative of intentional gathering of this seasonally available resource at a time when maize and other agricultural products were the principal plant resources in terms of their contribution to the subsistence base. The bluff edge setting of the Stemler Bluff site, within a band of oak-hickory forest flanking the valley margin, may be a factor in the relative abundance of nuts within the assemblage as nuts would have been readily available in the immediate site locale on a seasonal basis.

Second, maize ubiquity indices, 42.1 for cupules and 57.9 for kernel fragments, both fall well within the range for the Emergent Mississippian and Mississippian periods as calculated for 26 sites in the American Bottom and adjacent upland margins although both indices fall near the lower end of the range (Lopinot 1992:69–73). Maize kernel and cupule fragments account for 1.9 percent of the total archaeobotanical assemblage at 11MO891. Given the very fragmentary nature of the recovered maize remains—few complete kernels or cupules were present—any interpretations of the manner in which maize was utilized at the site are difficult to formulate. The charred kernel fragments represent lost or abandoned food remains while the cupule fragments represent the remains of the inedible rachis or cob. Given the fragmentary nature of the maize, it is not possible to make inferences regarding nature of its use at the site without a large degree of speculation. It is possible that the fragmentary charred kernels serve as evidence for the roasting of maize in a green or immature state. No statement regarding the possible storage and subsequent usage of dried maize, however, is attempted given the nature of the remains.

Third, and finally, the Stemler Bluff assemblage indicates that several varieties of starchy-seeded plants were utilized by the site's occupants. These plants, maygrass, chenopod, polygonum, and little barley, are well-represented in archaeobotanical assemblages beginning in the Middle Woodland period in the American Bottom region, and they form the core of a native horticultural complex that persists into the Mississippian period despite the introduction of maize (Johannessen 1984, 1988, 1993; Lopinot 1992). The ubiquity of these taxa, however, differs in some respects from other assemblages studied from the area. Combining the maygrass and little barley, both of which mature in the late spring to early summer, produces a ubiquity rating of 33.3 which is lower than that reported for previously sampled Emergent Mississippian and Mississippian components (Lopinot 1992:73–74). Similarly combining the autumn-maturing starchy-seeded plants, chenopod and polygonum, produces a ubiquity rating of 43.6 which is more in line with similar measures reported for Emergent Mississippian and Mississippian sites (Lopinot 1992:71–73). While evidence for these native cultigens was recovered, the low overall seed density, 1.03 seeds per liter of processed sediment, makes a fuller interpretation of their dietary contribution difficult. These differences in the ubiquity and relative abundance of the spring and fall-harvested starchy-seeded plants are subtle and may simply reflect sampling or preservational biases rather than differences in the intensity of their use at Stemler Bluff with respect to contemporaneous groups in the American Bottom region. However, similar or lower seed densities are reported from several small Mississippian farmstead sites such as Karol Rekas (Parker 1990) and Esterlein (Dunavan 1990).

Figure 7-2 illustrates a series of box-and-whiskers plots showing the breakdown of charcoal density, expressed in total grams of charcoal per 10 liters of feature fill, by feature types sampled at Stemler Bluff. This figure reveals that the sampled features, with the exception of the wall-trench structures, are fairly comparable in terms of charcoal density. The enormous range of variability within the wall-trench structures is due solely to the sampling of the burned structure 9/158. The degree of similarity between sampled contexts with respect to charcoal density is interpreted as an indication that charcoal was deposited within these features in a secondary rather than primary fashion in most instances. Exceptions to this generalization are Feature 235, a bell-shaped pit that shows evidence of in situ burning and reuse in the form of a hearth, and Feature 203, a burial feature with significant quantities of charred wood along the long axis of the pit, and as noted above, Feature 9/158.

Thus far, the archaeobotanical remains recovered at the Stemler Bluff site have been presented with respect to their occurrence in the various feature types present at the site, but little has been said regarding their temporal affiliation and the potential for elucidating temporal patterns in their presence and distribution. This is due, in part, to the fairly small assemblage recovered from the analyzed flotation samples, and to the inability to assign the majority of the sampled contexts to definite archaeological phases on ceramic grounds. The resulting samples, when subdivided into securely assigned phases, are believed to be too small to be statistically significant. It seems prudent to deal with the archaeobotanical assemblage as representing a mixed Emergent Mississippian and Mississippian assemblage rather than to attempt further subdivision at this time.

In summary, the archaeobotanical assemblage recovered from Stemler Bluff is one that is reflective of occupants that are engaged in agricultural production involving not only maize but a suite of starchy-seeded native plants as well as the gathering of wild resources such as nuts, fruits, and other plants for food and technological purposes. This

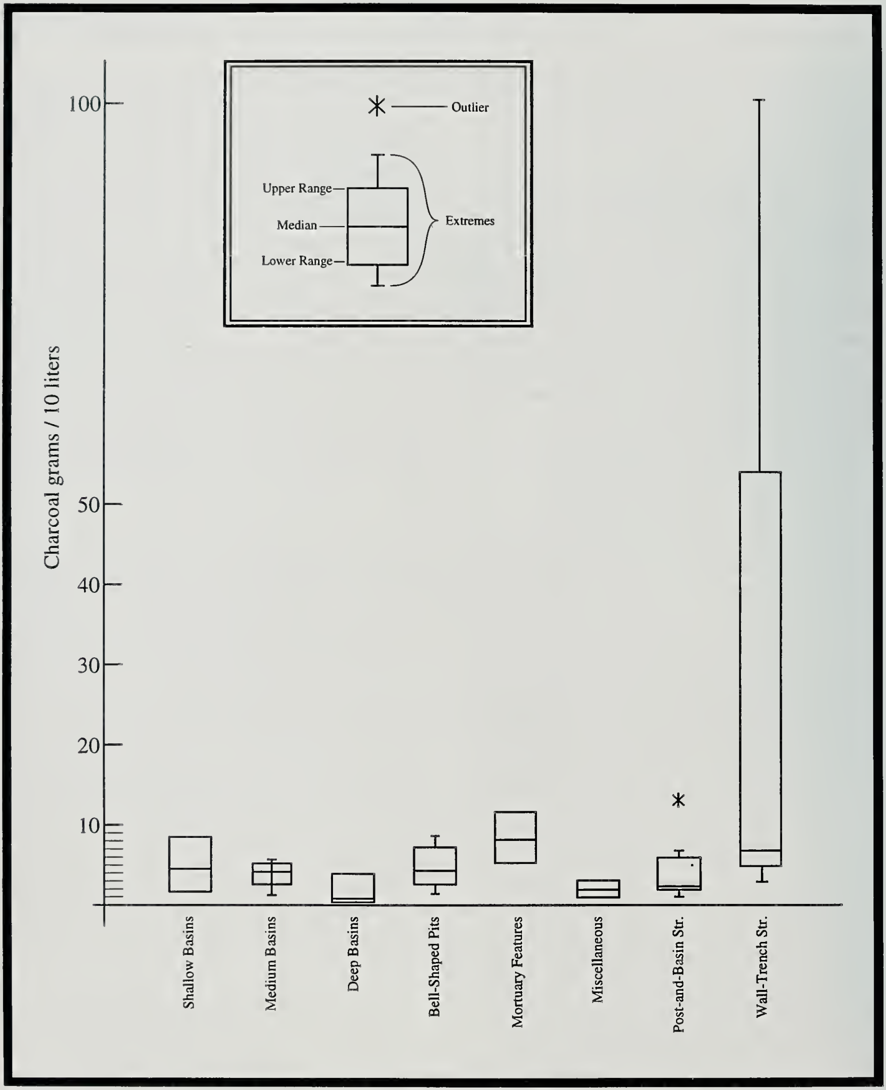

Figure 7-2. Box-and-Whisker Plots of Charcoal Density by Feature Type.

assemblage is, overall, quite similar to others reported from Emergent Mississippian and Mississippian sites in the American Bottom region, especially small household or farmstead type sites, although difference in the relative quantities of certain plant taxa are apparent. These differences, however, are best conceptualized as artifacts of sampling and preservation rather than as indicators of differing plant procurement and production strategies. Clearly, by the Emergent Mississippian period agricultural production had become a major economic pursuit in the American Bottom region and, though differences undoubtedly existed between upland and floodplain access to quality agricultural soils and cleared land, the resultant archaeobotanical assemblages studied to date suggest a fairly uniform resource base was being utilized after A.D. 750.

CHAPTER 8.
MORTUARY FEATURES AND HUMAN REMAINS

This section documents the mortuary features and human remains from the Stemler Bluff site. Radiocarbon dates from the habitation area indicate an occupation from c. 1110 to 760 B.P. Two radiocarbon dates from the mortuary area, located approximately 125 m to the west (Figure 4-1), suggest a more restricted period of use between 930 and 970 B.P. (± 60 yrs), or during the late Emergent Mississippian to early Mississippian periods.

The excavations at Stemler Bluff add to information from previous mortuary studies in the American Bottom (Milner 1984d). These earlier excavations include the Range site (Kelly et al. 1990; Milner et al. n.d.), East St. Louis Stone Quarry (Milner 1983b), Florence Street (Emerson et al. 1983), BBB Motor (Emerson and Jackson 1984; Milner 1984e), Schlemmer (West 1993), and others (Milner 1984c; Prentice and Mehrer 1981), as well as excavations at Fingerhut (Klepinger 1993; Witty 1993) and Kane Mounds (Milner 1982). The complete excavation of Stemler Bluff is especially important in that it ensures that the full range of mortuary behavior that occurred at the site has been documented and provides one of the most comprehensive summaries to date of Emergent Mississippian/Early Mississippian mortuary practices. Fifty-one features were identified in the Stemler Bluff mortuary area. Human remains representing 22 individuals, consisting of ten adults, six preadults, and six unidentified, were recovered from 20 features (Table 8-1).

Feature Morphology

Most pits (61 percent) in the mortuary area contained no identifiable human remains, although similarities in feature morphology (size and shape), fill, and apparent patterning in orientation suggest that most served a similar function. The spatial segregation and lack of feature superpositioning further suggest a cultural or social continuity between most interments. An historic fence row that cut through the mortuary area may account for some "empty" graves (Figure 8-1). The majority of "empty" graves are east of the fence row and may have suffered greater plow damage than features to the west.

Feature attributes in the mortuary area are presented in Table 8-2. The features tend to be oval to rectangular in plan, and are single-zoned and flat bottomed in profile (Figure 4-23). Eighty-eight percent of features are oriented between approximately 20° west and 60° east of north (Figure 8-2). Average feature dimensions for the mortuary area measure 111-x-52-x-24 cm. Pits containing bone are slightly larger on average than "empty" pits (Table 8-3). This perhaps reflects the age or size of those interred. The remains of smaller or younger individuals tend to preserve less well than those of larger more robust individuals (Gordon and Buikstra 1981).

Pit fill was a light-colored, compact, silty loam. Cultural materials recovered from mortuary features consist of a few small chert flakes and ceramic sherds. Nearly all occurred as incidental inclusions in feature fill. Feature 253 contained a large rim sherd in association with dental remains. It is unclear whether this represents an incidental inclusion or the remains of a broken mortuary vessel.

Very few graves show evidence of significant preparation. In the majority of cases, graves appear to have been dug to a size just large enough to contain the body. The remains were positioned on the floor of the grave and then covered with soil.

Eight features show evidence of more elaborate grave preparation including limestone slabs or charred wood suggesting grave lining. Limestone slabs were found in six mortuary features. In four cases (Features 195, 198, 249, and 250) these were fairly small slabs encountered at the surface or just within a pit feature. These may represent collapsed

Table 8-1. Stemler Bluff Burial Attributes.

Feature	Skeleton	Age	Sex	Criteria	Burial Type	Body Orientation
19	1	adult	indeterminate	S	primary, extended	West
184	2	indeterminate	indeterminate		indeterminate (articulated long bones)	
185	3	adult?	indeterminate	S	primary, extended?	North
188	4	adult	indeterminate	S	indeterminate, disturbed? (Skull and lbs msng	
192	5	8–11 years	indeterminate	D	indeterminate	
195.3	6	> 30 years	female?	D, DJD, ATR, Mand, Size	secondary, bundle	
195.2	7	19–25 years	female	D, EO, AUR/Cran, Pelvis, Size	secondary, bundle (partial articulation)	
195.1	8	12 mos±4mos	indeterminate	D	secondary, bundle (mandible only)	
198	9	adult	female?	S/Pelvis	indeterminate, disturbed? (Top half msg)	
204	10	indeterminate	indeterminate		indeterminate	
216	11	adult	indeterminate	S	primary, extended	Southwest
217	no #	indeterminate	indeterminate		indeterminate	
218	no #	indeterminate	indeterminate		indeterminate	
240	12	1 yr±4 mos	indeterminate	D	indeterminate (cranial and dental only)	
241	13	adult	indeterminate	D, S	primary, extended (modified incisors)	West
242	14	preadult	indeterminate	S	indeterminate (cranial only)	
243	15	adult	indeterminate	S, D, ATR	primary, extended	South
244	16	adult	indeterminate	S	primary, loosely flexed	West
248	17	indeterminate	indeterminate		indeterminate	
250	18	3 yrs±12 mos	indeterminate	D, S	primary, flexed	South
253	19	3 yrs±12 mos	indeterminate	D	indeterminate (mandibular dentition only)	
262	20	indeterminate	indeterminate		indeterminate	

Key: Age Criteria: S=size; D=dental eruption; ATR=dental attrition; DJD=degenerative changes; EP=epiphyseal union; AUR=auricular surface.
Sex Criteria: Mand=mandibular morphology; Cran=cranial morphology; Pelvis=pelvic morphology; Size=relative size.

Figure 8-1. The Stemler Bluff Site Mortuary Area.

Table 8-2. Mortuary Feature Attributes.

Feature	Skeleton	Length (cm)	Width (cm)	Depth (cm)	Orientation (° E of grid N)	Comments
19	1	170.00	60.00	38.00	90°	
184	2	0.00	0.00	surface	0	
185	3	100.00	35.00	29.00	178°	
188	4	130.00	60.00	7.00	179°	stone box grave
192	5	125.00	51.00	14.00	35°	
195	6, 7, 8	137.00	68.00	10.00	62°	limestone on surface
198	9	130.00	53.00	38.00	44°	limestone on surface
204	10	188.00	70.50	40.00	61°	
216	11	126.00	45.00	47.00	27°	
217	no#	92.00	80.00	52.00	20°	charred wood along ends
218	no#	54.00	25.00	15.00	0°	
240	12	111.50	76.00	31.00	0°	
241	13	207.00	77.00	56.00	59°	
242	14	123.00	59.00	49.00	0°	
243	15	184.00	45.00	37.50	9°	limestone along ends, wood along sides
244	16	180.00	60.00	18.00	89°	
248	17	85.00	44.00	10.00	18°	
250	18	50.00	34.00	7.50	0°	limestone within pit
253	19	67.00	34.00	18.00	174°	rim sherd
262	20	113.00	34.00	19.00	24°	
186		70.00	48.00	11.00	23°	
189		67.00	37.00	-	174°	
190		95.00	62.00	34.00	60°	
191		108.00	64.00	77.00	4°	
193		97.00	54.00	15.00	19°	
196		112.00	54.00	32.00	51°	
197		80.00	44.00	19.00	48°	
199		139.00	69.00	34.00	48°	
200		134.00	72.00	28.00	16°	
201		70.00	37.00	8.00	51°	
202		102.00	69.00	20.00	41°	
203		133.00	55.00	20.00	18°	charred wood along sides
205		58.00	65.00	19.00	21°	
211		69.00	29.00	17.00	58°	
212		77.00	33.00	15.00	83°	
213		106.00	47.50	16.00	44°	
214		169.00	73.00	28.00	55°	
215		152.00	68.00	20.00	49°	
219		78.00	39.00	15.00	172°	
220		92.00	44.00	36.00	122°	
237		132.00	40.00	25.00	16°	
238		111.00	41.00	34.00	23°	
239		191.00	82.00	19.00	44°	
245		80.00	30.00	19.00	58°	
246		84.00	41.50	11.00	160°	
247		95.00	40.00	9.00	14°	
249		94.00	65.00	10.00	90°	limestone on surface
251		96.50	43.00	15.00	47°	
252		105.00	45.00	13.00	18°	
261		70.00	33.00	33.00	90°	
263		154.00	90.00	24.00	173°	
COUNT		51	50	50		
RANGE		50–207	25–90	7–77		
MEAN		111.86	52.49	24.73		
ST DEV		38.97	16.13	14.59		
MEDIAN		105.50	49.50	19.00		

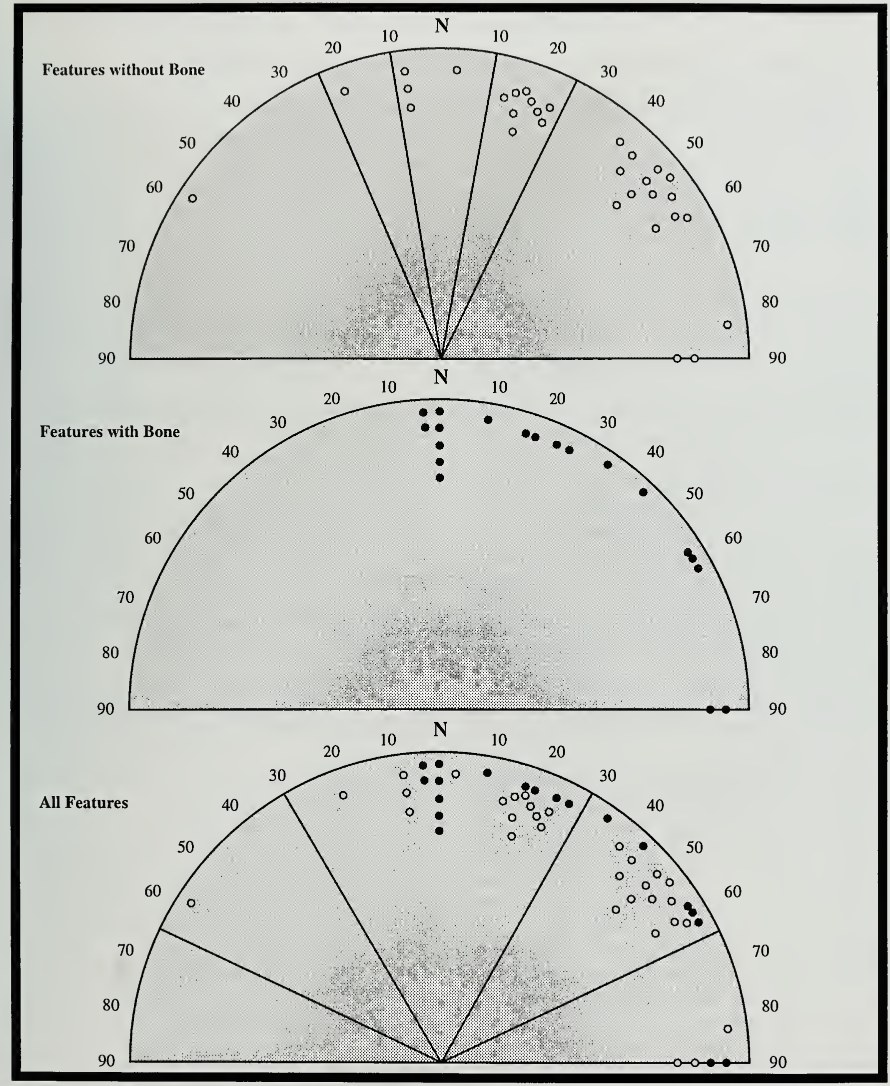

Figure 8-2. Orientation of Features in Mortuary Area.

Table 8-3. Stemler Bluff Mortuary Feature Dimensions.

All Features (n=51)	length (cm)	width (cm)	depth (cm)
range	50–207	25–90	7–77
mean	111.86	52.49	24.73
standard deviation	38.97	16.13	14.59
median	105.50	49.50	19.00
Features with Bone (n=20)	length (cm)	width (cm)	depth (cm)
range	50–207	25–80	7–56
mean	124.87	53.18	28.21
standard deviation	45.40	16.59	16.26
median	125.00	53.00	29.00
Features without Bone (n=31)	length (cm)	width (cm)	depth (cm)
range	58–191	29–90	8–77
mean	103.89	52.06	22.53
standard deviation	32.73	16.11	13.24
median	96.50	47.50	19.00

roof or wall slabs. There is evidence to suggest that some surface limestone was damaged and displaced by historic plowing.

In Feature 243, limestone slabs were positioned vertically at both ends of the pit while charred timbers appear to have lined the floor and sides. Features 203 and 217 also contained charred timbers along the sides of the pits. Charcoal samples from Features 203 and 217 were dated to 970 ± 60 and 930 ± 60 B.P., respectively. These features are similar in construction to Feature 1477 at the Range site. The Range site feature was radiocarbon dated at 900±100 B.P. (ISGS-954) (Milner et al. n.d.).

Feature 188 represents the only "stone box grave" at the site (Figure 4-24). This feature was defined by a layer of horizontally positioned limestone slabs covering the top and bottom of the feature. Vertically positioned slabs lined the walls, and the floor pavement was placed on sterile soil. Partially disarticulated human remains were found on the floor. Stone box graves have been found at a number of sites in Illinois and Missouri and generally have been attributed to the late Mississippian period (Milner and Shroeder 1992). A reexamination of the "stone-box" grave cemeteries at Florence Street and East St. Louis Stone Quarry by the Illinois Transportation Archaeological Research Program suggests that these mortuary facilities date to the Moorehead-Sand Prairie transition (Emerson et al. 1996). Recent radiocarbon dates from Florence Street and East St. Louis Stone Quarry cluster between 697 and 657 B.P. Even earlier dates have been suggested for stone box grave sites in Missouri (Farnsworth and Emerson 1989; Collins and Henning 1996).

Human Remains

Bone preservation at Stemler Bluff, as at a number of American Bottom mortuary sites, is extremely poor. Elements are typically fragmented, very soft, and heavily eroded. Dental remains are generally better preserved and often are the only elements recovered. The presence of limestone slabs in a burial feature is positively correlated with increased bone preservation. While 6 of 20 (30 percent) features containing bone had associated limestone, limestone was associated with only 2 of 31 (6 percent) "empty" features.

Seven primary interments of extended or loosely flexed individuals were identified; these include six adults and one preadult. One bundle burial containing partial remains of three individuals (two adults and one preadult) also was identified. Twelve of the burials were of an indeterminate nature, with five of these appearing to have been prehistorically disturbed or redeposited. Features 188 and 198 contained jumbled postcranial elements with crania and upper limbs missing. Features 240, 242, and 253 contained only cranial and/or dental remains. The remaining indeterminate burials either were isolated elements within feature fill or too poorly preserved to be identified. Individual burial descriptions are presented in Appendix F.

Methods

Human remains were documented according to standards for data collection presented by Buikstra and Ubelaker (1994). Standard osteological observations include element inventories, age-at-death estimates, sex determinations, assessments of skeletal and dental pathologies, and both metric and nonmetric characteristics (skeletal and dental) for each individual and isolated find. These observations are used to assess the health status and biological affinity of the Stemler Bluff population. Comparisons are drawn with other American Bottom mortuary sites. The inventory and analysis tables are presented in Appendix F. Standard methods for age-at-death estimation, sex determination, pathology observation, and metric and nonmetric observations are summarized below. In addition to written records produced during the inventory and analysis of the Stemler Bluff materials, photographic records were made to document age and sex criteria, pathological conditions, and evidence of cultural modification.

In accordance with contractual agreements, no destructive analyses were conducted on these remains, and no bone samples were collected. It is recommended, when possible, that small (10 g) samples of bone be retained for future analyses. Isotopic analysis can provide significant insight into the diet of prehistoric populations. A recent isotopic study addressing Mississippian diet suggests gender-based differences in the diet of American Bottom Mississippian populations (Williams et al. 1997). AMS dates require a very small amount of organic material. Given the lack of temporally diagnostic materials associated with many of these burials, AMS dates of the bone itself would significantly increase our understanding of the temporal association of many of these cemetery populations. Further, recent advances in molecular genetic techniques have enabled the recovery of DNA from ancient soft tissue and bone (Stone and Stoneking 1993). Ancient DNA has great potential for addressing archaeological issues concerning migration, residence patterns, and the genetic relationships of ancient human populations.

Age Estimation

Due to poor skeletal preservation, most individuals were placed into general "adult" or "preadult" categories. Relative size commonly was used to indicate an adult age. Evidence for the eruption of third molars (Ubelaker 1978), the degree of dental attrition scored according to methods presented by Scott (1979) and Smith (1984), evidence for premortem tooth loss, and arthritic changes of postcranial elements also were used to confirm adult age. The auricular surface morphology of the ilium (Lovejoy et al. 1985) and evidence of epiphyseal union (Stewart 1979) were observed for only one individual. Age-at-death estimates for preadults were determined using dental development and eruption standards provided by Ubelaker (1978) and Moorrees et al. (1963a, 1963b) (summarized in Buikstra and Ubelaker 1994). Size alone indicated the preadult age of two individuals.

Based on available criteria, it was possible to determine age-at-death for 16 of 22 individuals (ten adults, six preadults). The very poor bone preservation at this site resulted in nine individuals being aged only to adult or preadult categories. Seven individuals were assigned to chronological age categories (Table 8-4). These age estimates were based largely on dental remains (Appendix F).

Sex Determination

Sex was assigned to three adults (all females) using criteria outlined in Buikstra and Ubelaker (1994). Innominate criteria included the greater sciatic notch and preauricular sulcus. Cranial characteristics consisted of the mastoid process, supraorbital ridges, nuchal crest, glabella, and the mental eminence of the mandible. Size (robust or gracile) also was used as supporting evidence for assigning sex to an individual. Morphological sex distinctions are not clearly present until later adolescence; therefore, no attempt was made to determine sex for juvenile remains. Although only females were clearly identified in this sample, morphological variation (particularly size) among individuals suggests that both males and females are represented in the Stemler Bluff burial population.

Pathology

The identification of pathological conditions in a skeletal population can provide invaluable information about the ability of a population to survive periods of stress, whether they arise from infectious diseases or nutritional stress. Dental remains can provide significant information on the health and subsistence practices of otherwise poorly preserved skeletal populations. The pathologies from this sample are difficult to quantify due to the often fragmentary nature of the individuals. Therefore, the pathologies present are described but not discussed in terms of frequency.

All available bones and teeth were visually inspected for evidence of pathology and evaluated with standard reference materials (Morse 1978; Ortner and Putschar 1981; Steinbock 1976). The poor bone preservation severely limited the information available from this population. The preservation of cortical surfaces of bone allowed for the evaluation of only three individuals (Skeletons 6, 7, and 9) (Appendix F). Pathologies observed include osteoarthritis (marginal lipping and surface pitting of articular joints) and alveolar resorption indicating premortem tooth loss. Skeletal pathologies were found only on Skeleton 6, Feature 195.

Stemler Bluff dental elements are fairly well preserved and provide the best evidence for the health status of this population. Dental conditions recorded include premortem tooth loss, carious lesions, and linear enamel hypoplasias (LEHs). Premortem tooth loss is indicated by resorption of alveolar bone. Only four mandibles and one maxilla could be observed for premortem tooth loss. Skeleton 6 had complete alveolar resorption of bone corresponding to the right mandibular second molar and left mandibular first and second molar.

Dental caries are the most commonly observed dental pathology in skeletal populations. They are especially useful in dietary reconstruction because of a demonstrated association of increased caries rates and the consumption of carbohydrate-rich foodstuffs such as maize (Lukacs 1989; Rose et al. 1991). Sixty-three teeth in occlusion were observed for carious lesions (Appendix F). Six teeth, representing two adults (Skeleton 6 and 7) and one preadult (Skeleton 18) suffered carious lesions. Skeletons 6 and 7 each had one carious tooth (mo-

Table 8-4. Stemler Bluff Demographic Profile.

Age Category (years)	Number of Individuals	
0–4.9	4	
5–9.9	1	
10–14.9		
15–19.9		
20–29.9	1	(female)
30–49.9	1	(female)
50+		
preadult	1	
adult	8	(1 female)
indeterminate	6	
Total	22	

lars); Skeleton 18 (discussed below) had linear caries on the maxillary incisors secondary to hypoplastic events.

The caries rate of 7.69 percent of teeth affected is more characteristic of a mixed economy subsistence pattern than one of high maize dependence (Lukacs 1989:281). Because of the small sample size and typically incomplete nature of most dental arcades, this number should be taken only as a general indication of low caries rate. Two of the three individuals affected were recovered from Feature 195. Feature 195 is unique in that it is the only bundle burial of multiple individuals identified at Stemler Bluff. Individuals recovered from Feature 195 also exhibit much better bone preservation than others recovered from the mortuary area at the site.

Linear enamel hypoplasias are lines of arrested growth caused by a disruption in ameloblast (enamel forming) activity and are related to general metabolic disruption such as episodes of nutritional or disease stress (Goodman and Rose 1991). Unlike bone, dental enamel is not remodeled after growth and therefore provides a detailed record of health between birth and about six years of age. Enamel hypoplasias appear as horizontal linear grooves or pits in the enamel surface, most obvious on the labial (buccal) aspect of the tooth crown (Lukacs 1989). The number and location of each LEH (as measured from the midpoint of the cemento-enamel junction) was recorded for each observable tooth.

All teeth with fully developed crowns (n=78) were observed for evidence of linear enamel hypoplasias (Appendix F). Linear enamel hypoplasias occur on the anterior dentition of all observable individuals (four adults, two preadults). All show evidence of at least one, and in three cases multiple, episodes of arrested growth, indicating periods of disease or nutritional stress during childhood (Cook and Buikstra 1979). Linear enamel hypoplasias occurring on deciduous dentition of Skeleton 8 (Feature 195, 12mo±4 mo) and Skeleton 18 (Feature 250, 3 yr±12 mo) indicate that these children experienced stress in utero or during early childhood. Skeleton 18 is unusual in that the hypoplasias occur as linear caries on the maxillary dentition.

Severe hypoplastic lesions of deciduous dentition can become carious. The result is a transverse carious band on the labial or buccal aspect of the teeth (Cook and Buikstra 1979). Epidemiological studies indicate a correlation between these deciduous caries and severe malnutrition. A significant association also has been reported between hypoplasias and prematurity and poor nutrition, infectious disease, and acute diarrheal disease during the first few weeks of life (Cook and Buikstra 1979).

Milner (1983b) observed linear caries on teeth in the East St. Louis Stone Quarry (Sand Prairie phase) sample. Only one other skeleton (adult) from the Sand Prairie phase occupation of the Tract 15B areas at Cahokia is known to have linear caries.

Measurements

When possible, skeletal and dental elements were measured using the criteria presented in Buikstra and Ubelaker (1994). Measurements were taken using sliding calipers, spreading calipers, metric tape, or an osteometric board. Measurements are presented in Appendix F. Stature estimates were not computed because of the incomplete nature of most elements. The Stemler Bluff sample is too small for meaningful comparisons to be drawn with other populations.

Nonmetric Assessment

Nonmetric traits derived from Buikstra and Ubelaker (1994) and Gill and Rhine (1990) were recorded when possible. Traits were recorded as present or absent with both sides considered (Appendix F). Nonmetric or discrete traits provide a useful tool in determining the degree of morphological similarity between two or more populations. However, the Stemler Bluff sample is too small for meaningful comparisons to be drawn with other populations.

Discrete traits are also useful in determining racial affiliation for skeletal remains in both archaeological and forensic situations (Gill and Rhine 1990). Although no morphological trait is completely race-specific, Hinkes (1990) cites the presence of shoveled incisors as the most reliable indicator of mongoloid racial affiliation. All observable incisors in the Stemler Bluff sample exhibit shoveling. This skeletal evidence, in combination with the geographical location and prehistoric date of the site, indicates an Amerindian racial classification for the Stemler Bluff skeletal population.

Cultural Modification

Evidence of dental modification was observed on one individual. Skeleton 13, an adult, (Feature 241) exhibits a "Type A1" modification of the incisal/occlusal edge of the central maxillary incisors—a single notch present on the incisal edge of each tooth (Plate 8-1), as illustrated in Buikstra and Ubelaker (1994:58–59).

Virtually all filed teeth from eastern North America are from Mississippian sites in west-central Illinois, and most of these are from the American Bottom. Similarly notched teeth have been described from Schild and Dickson Mounds in the central Illinois River valley (Perino 1967; Stewart 1944), and the Range (Milner et al. n.d.) and East St. Louis Stone Quarry (Milner 1983b) sites. Additional specimens have been reported from a number of other American Bottom sites, including Cahokia Mound 20, and poorly provenienced burials at Cahokia, Monroe County (near Columbia), and Jersey County (Perino 1967). Several sites had multiple skeletons with modified teeth (Milner and Larsen 1991). Although modified teeth are clearly infrequent, meaningful frequencies are unavailable because of poor bone preservation, small sample sizes, and poor contextual or temporal control.

All securely dated American Bottom skeletons with modified teeth belong to the Mississippian period (950–500 B.P.). Both males and females are represented. The individuals are from cemeteries associated with a subordinate social stratum but are not otherwise distinguished from other burials in the cemeteries.

The significance of filed teeth has yet to be determined. Some researchers have suggested a connection to Mesoamerica where such deformation is quite common prehistorically (Holder 1958). This reflects an earlier belief that Mississippian cultures were strongly influenced by those of Mesoamerica. Milner and Larsen (1991) present arguments for an independent origin for the practice of dental mutilation in west-central Illinois. They argue that the practice of dental modification is worldwide, current interpretations of Mississippian cultures emphasize an indigenous development, several types of dental modification observed in Illinois samples have not been reported for Mesoamerica, and American Bottom skeletons with modified teeth are not associated with high status positions consistent with putative dealings with distant peoples.

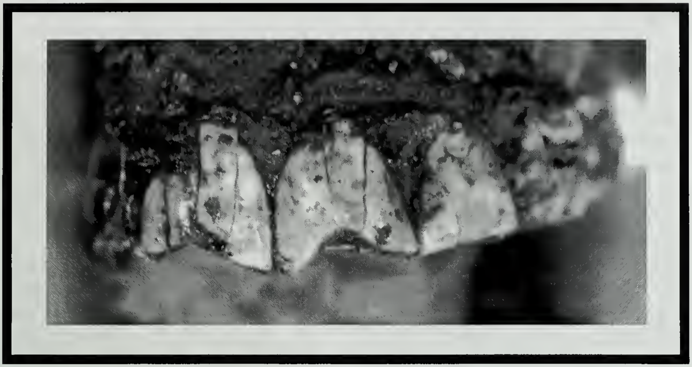

Plate 8-1. Examples of Modified Central Incisors (from Skeleton 11, Feature 216).

Discussion

Mortuary patterns for the Late Woodland and Emergent Mississippian periods in the American Bottom are not well known. Very few formal cemeteries or burial mounds dating to the Late Woodland, and none clearly dating to the Emergent Mississippian period, have been recorded for this area, although it must be noted that a large number of mounds in the American Bottom have not been systematically investigated. Articulated skeletons are rare for these time periods. Most interments dating to these time periods consist of isolated burials or elements, particularly crania and mandibles, recovered from nonmortuary features or habitation areas (Milner 1984d). These many examples of disarticulated skeletons suggests a multistage processing of the deceased (Milner 1984d).

The Mississippian period, in contrast, was a time of varied and often complex mortuary practices, reflecting a greater degree of social differentiation when compared to earlier periods. Population growth in the American Bottom during the Mississippian period has been tied to more intensive maize agriculture and the emergence of Cahokia as a regional center (Kelly 1990; Milner 1986, 1987). The complex social hierarchies identified in Mississippian community structure are also reflected in mortuary practices.

Most Mississippian burials in the American Bottom have been found in formally defined cemetery areas. Milner (1982, 1984b) identifies three categories of cemeteries for the American Bottom according to their location and the inferred social status of the burial areas. These include nonelite cemeteries associated with outlying communities; cemeteries of low-status individuals within regional town-and-mound centers; and cemeteries for the elite, also located in regional centers. There is little information, however, on regional or temporal patterning of cemeteries affiliated within the American Bottom. The excavation of the Stemler Bluff cemetery adds considerably to our knowledge of mortuary practices in the American Bottom during the Emergent Mississippian/Mississippian periods.

The Stemler Bluff mortuary area shares many traits with Milner's (1984b) nonelite cemeteries associated with outlying communities. These traits form a syntax, or structure, for Mississippian mortuary practices observed at both outlying communities and regional centers and in burials of both elite and nonelite members of society (Milner 1984b). These include: (1) cemeteries separated from the principal habitation areas; (2) internal organization with graves that are tightly clustered and similarly oriented; (3) reuse of mortuary features; (4) presence of disarticulated bundled burials and articulated extended burials, sometimes with individuals at different stages of decomposition present in the same grave; and (5) individuals of all age categories and both sexes represented. Mississippian cemeteries are further characterized by associated artifacts, only occasionally fashioned from exotic materials, and the frequent construction of stone box graves.

Poor preservation prevents a detailed analysis of mortuary treatment. Primary and secondary burials are present. The presence of a secondary bundle burial of three individuals of various ages and exhibiting different stages of disarticulation and completeness suggests a mortuary pattern involving the curation of bodies for later, perhaps seasonal, burial. The processing of the dead may have involved the primary decomposition of bodies within pits, possibly marked by slabs of limestone or wood superstructures. Evidence of selective removal or curation of elements is suggested by apparently prehistorically disturbed burials that lack cranial or dental elements, and pits which appeared to contain only cranial or dental elements. No cut marks are present on observable bone to indicate the removal of soft tissue or disarticulation of skeletal elements, but poor bone preservation may inhibit the observation of such marks.

While the duration of use has not been determined for the Stemler Bluff cemetery, the lack of superpositioning and similarity in pit construction would suggest a restricted period of use and contemporaneity or sequential contemporaneity of features. The two dates from the cemetery are statistically similar and suggest use during the late Emergent Mississippian or early Mississippian period. Similarities between Stemler Bluff and other American Bottom Mississippian mortuary sites, together with evidence for occupation of the site during the Emergent Mississippian and Mississippian periods, would support an early Mississippian affiliation of the cemetery.

The dates and proximity of the Stemler Bluff cemetery to the habitation area suggest that it was used primarily by site inhabitants, perhaps for several generations. It is also possible, given the small number of structures and the relative short duration of estimated cemetery use, that individuals from surrounding farmsteads also may have used this cemetery. Goldstein (1980, 1981) has suggested that multicommunity cemeteries reflect community or social distinctions in the arrangement of the mortuary area. Burial orientation or placement within the cemetery may be based on social distinctions.

The majority of mortuary features at Stemler Bluff were oriented north-south and northeast-southwest. A similar consistency in feature orientation characterizes a number of Mississippian cemetery and mound sites. Different orientations may represent distinct periods of use. Differing grave orientations may represent social distinctions among the deceased (see Goldstein 1980, 1981). Or, they may reflect ideological considerations of the society. Solar phenomena is presumed to partly determine the orientation of burials at Fingerhut, Hatchery West, and Dickson Mounds (Milner 1983b). Burials at Kane Mounds and Florence Street appear oriented relative to mortuary structures or large ceremonial centers. Witty (1993) notes that the early Mississippian period is contemporaneous with the early construction of Monks Mound at Cahokia and the construction of Woodhenge, indicating that solar phenomena was important and likely played a significant role in the alignment of the dead during this period.

Stemler Bluff shares many characteristics with the recently excavated Holliday site (11S27), a

Lohmann phase habitation and mortuary site located in the uplands within the town of O'Fallon, Illinois (Hargrave and Hedman 1997). Both sites consist of clearly defined mortuary areas associated with, but separate from, the habitation area. Features within the mortuary areas show a uniformity of construction and orientation, an absence of associated grave items, and the possible reflection of social groups in the clustering of graves. Both sites are characterized by extremely poor bone preservation yet it is clear that both males and females and nearly all age categories are represented in the interments.

Isolated human remains also were recovered from the habitation area of Stemler Bluff (Appendix F, Figure 8-3). These may represent any one of the occupations. Such inclusions of human remains in the fill of nonmortuary features is characteristic of the Late Woodland and Emergent Mississippian periods in the American Bottom and has been observed at a number of sites including Turner (Milner 1983a), Lohmann (Esarey and Pauketat 1992), BBB Motor (Emerson and Jackson 1984), and Range (Kelly et al. 1990).

Summary

The excavation and analysis of Stemler Bluff provides insight into settlement and mortuary behavior of an Emergent Mississippian or early Mississippian population inhabiting the upland region of the southern American Bottom. Most available information on Emergent Mississippian and early Mississippian periods for the American Bottom is derived from floodplain sites, few of which have significant mortuary components (Bareis and Porter 1984; Esarey and Pauketat 1992; Fortier 1996; Milner 1990; Witty 1993, among others). There is a significant lack of comparable information on populations inhabiting areas away from the floodplain and the southern portion of the American Bottom (Hargrave and Hedman 1997; Wittry et al. 1994).

A variety of settlement patterns characterize this time period, including small farmsteads, hamlets, and large villages. The existence of such variation in settlements has been interpreted as an indication that a hierarchical settlement system predominated in the American Bottom at this time (Bareis and Porter 1984; Milner 1990). Increasing social stratification is also evidenced for this period (Milner 1984b). Mortuary practices are known, in some cases, to reflect the social position of the deceased. In the American Bottom, deceased members of the elite were distinguished by special handling, ostentatious display of status goods, and often are further set apart by interment within mounds. Elite cemeteries, whether in mounds or nonmound settings, are generally separate from nonelite cemeteries and consist primarily of adults (Milner 1984b). Nonelite cemeteries generally display little difference in mortuary treatment and consist of males and females, adults, and children. Grave offerings, when included with nonelite burials, often consist of utilitarian items used by the individual during life. There is little evidence for social stratification during the Emergent Mississippian period, but during the subsequent Mississippian period, ample evidence for social stratification exists in situations such as the elaborate mortuary treatment observed at Mound 72 at Cahokia (Milner 1984b).

Stemler Bluff appears to represent an Emergent Mississippian to early Mississippian upland habitation and cemetery site. Mortuary characteristics suggest a lack of significant social differentiation within the Stemler Bluff population. Both sexes and all age categories are represented in the mortuary sample and few distinctions in burial treatment are recognized.

Differences in burial treatment that are noted include variation in grave construction and orientation. These may reflect temporal differences between interments, social distinctions between individuals, religious or philosophical considerations of the community, or a combination of factors. Temporal differences are most strongly suggested for an outlying bundle burial (Feature 195) and a "stone

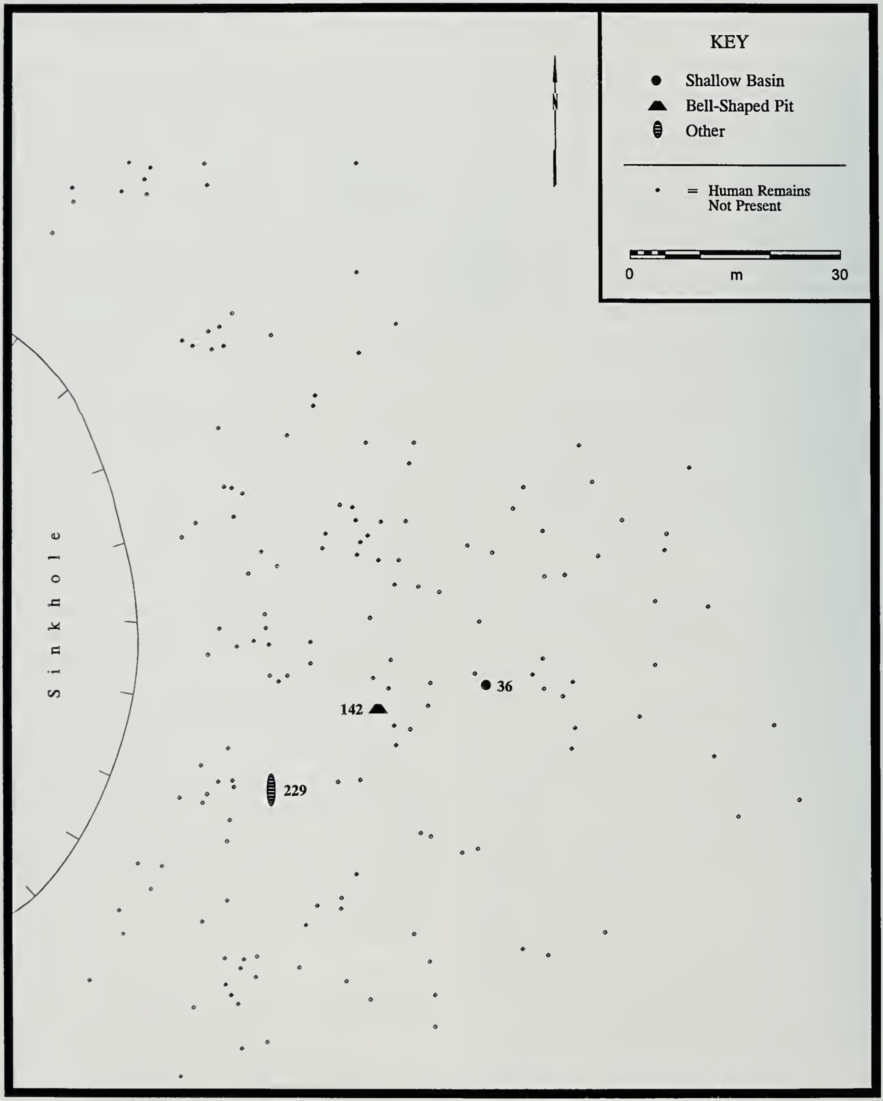

Figure 8-3. Distribution of Residential Area Features Containing Isolated Human Remains.

box" grave (Feature 188). Other graves are fairly tightly clustered and show no superpositioning suggesting a short duration of use or well-marked graves. There is no clustering of similarly constructed graves; however, similarly oriented graves do tend to occur in close proximity to one another (Figure 8-1). Lacking biological or archaeological evidence for social or temporal distinctions and having very few contemporaneous cemeteries for comparison, no conclusive statements can be made regarding the Stemler Bluff mortuary area.

Poor preservation prevents an accurate assessment of the demographic profile and health status of this population. Adults and preadults are represented. Without specific age categories identified, no mortality profile can be determined. Bone preservation was extremely poor. With the exception of age-related degenerative changes in one individual, no skeletal pathologies were observed. Dental remains provide better evidence of the health status of this population. The caries rate for the Stemler Bluff sample is significantly less than that of later East St. Louis Stone Quarry or Florence Street populations (Milner 1983b; Emerson et al. 1983). The caries rate of 7.69 percent falls below expected caries rates for agricultural populations and suggests that the Stemler Bluff population practiced a mixed subsistence economy (Lukacs 1989:281). Linear enamel hypoplasias on all observable individuals indicates that the Stemler Bluff population typically experienced periods of nutritional or disease stress during infancy and childhood. There is a clear synergistic relationship between nutritional deficiencies and infectious disease (Scrimshaw et al. 1968). Therefore, although no evidence of infectious disease was observed on the bone of Stemler Bluff individuals due to extremely poor preservation, generalized infections are expected and would have been exacerbated by periods of episodic nutritional stress as suggested by the presence of linear enamel hypoplasias. The analysis of the Stemler Bluff mortuary sample does provide limited, but important, information on the life and health of this population. It also illustrates the information to be gained from the excavation and analysis of fragmentary, poorly preserved human remains.

CHAPTER 9.
FAUNAL ANALYSIS

A total of 6,463 faunal elements recovered from the Stemler Bluff site was analyzed using comparative skeletal collections at the University of Illinois and the Illinois State Museum. A discussion of analytic methods has been presented in Chapter 4 of Volume 1. This material was obtained from general excavation and flotation samples. Faunal remains were recovered during excavation either by hand collection or from screening soil through 6.4-mm mesh hardware cloth. This procedure has been shown to be somewhat biased against elements smaller than 6.4 mm in length. Species with elements less than 6.4-mm long may be underrepresented or not recovered in general excavation samples. In an attempt to address this bias and recover and identify smaller species or elements, faunal remains from flotation samples were also analyzed. Flotation methods have been discussed in Chapter 7 of this volume.

Faunal remains were collected from 88 of 209 features (42 percent) by hand collection or screening. A total of 2,963 elements was collected in this manner. In contrast, 3,500 elements were recovered from the 26 of 38 features that were sampled by flotation analysis. Five of these features yielded remains from flotation samples but not from general excavation. While having fairly similar sizes, the samples generated by the two techniques differ in terms of class composition. Mammals and fish are most common in the general excavation sample, with unidentifiable vertebrate elements least common. In contrast, fish and unidentifiable vertebrate elements are most common in the flotation sample while mussels and gastropods are least common. These differences indicate that the two methods sampled different populations, most probably based on element size.

This chapter presents the results of the analysis of faunal remains from 93 of the Stemler Bluff features. An overview of the entire assemblage is first presented. Temporal differences in the faunal assemblages then are explored. Finally, the Stemler Bluff faunal assemblage is placed into a wider perspective of American Bottom faunal exploitation strategies. A multidimensional scaling analysis of faunal data, mainly based on class composition, of 13 Emergent Mississippian or Mississippian period assemblages from 10 different sites, including Stemler Bluff, is presented. Several bone tools recovered from the Stemler Bluff site are also described at the end of this chapter.

Assemblage Overview

The Stemler Bluff faunal assemblage is comprised of 6,463 elements from 93 features. This figure represents a combination of remains from both general excavation and flotation samples. Of this total, approximately 16 percent were identified below the level of class (Table 9-1). Burning or calcining is present on 2,628 elements, or 41 percent of the assemblage. Within this assemblage fish are most common, followed by mammals, vertebrate, birds, mussel/gastropod, and finally, reptiles and amphibians (Table 9-1). The Stemler Bluff faunal assemblage is presented by feature type. Faunal remains were recovered from medium basins (Table 9-2), deep basins (Table 9-3), shallow basins (Tables 9-4 through 9-6), bell-shaped pits (Tables 9-7 and 9-8), single-post-and-basin structures (Tables 9-9 and 9-10), and wall-trench structures, unidentified features, and surface (Table 9-11) contexts. Number of identified specimens is presented for each taxa, with minimum number of individuals, when calculated, presented in parentheses.

Fish

Fish comprise 41 percent of the entire Stemler Bluff assemblage and 57 percent of the elements identified below the level of class (Table 9-1). Fish remains were present in 42 of the 93 features, or 45 percent. The highest average number of fish per

Table 9-1. Identified and Unidentified Faunal Remains by Taxonomic Class.

Taxon	No. Identified	% Identified	No. Unidentified	Total	% of Total
Vertebrate	—	—	1,317	1,317	20
Mammals	217	22	1,523	1,740	27
Birds	79	8	328	407	6
Reptiles and amphibians	132	13	9	141	2
Fish	574	57	2,056	2,630	41
Invertebrates	7	<1	221	228	4
Total	1,009	100	5,454	6,463	100

Table 9-2. Faunal Remains from Medium Basins.

Taxa	F 5	F 33[a]	F 47	F 124[a]	F 138	F 155
Unidentified mussels	10	0	0	0	0	0
Unidentified fish	4	0	1	8	0	0
Unidentified turtle	0	2	0	0	0	0
Unidentified bird	0	0	2	1	1	0
Odocoileus virginianus (white-tailed deer)	4(1)	0	0	0	0	0
Small mammal	1	0	0	0	0	0
Large mammal	25	81	0	1	1	1
Unidentified mammal	1	0	0	0	0	0
Vertebrate	7	0	1	1	0	0
Total	52	83	4	11	2	1

[a] General excavation and flotation samples combined.

Table 9-3. Faunal Remains from Deep Basins.

Taxa	F 61[a]	F 67	F 72	F 88[b]	F 137	F 258[a]
Unidentified mussel	0	1	0	0	0	0
Lepisosteus spp. (gar)	0	0	0	22(1)	0	0
Ictiobus cyprinellus (bigmouth buffalo)	0	0	0	0	1(1)	0
Catostomidae (suckers)	0	0	0	0	2	0
Ictalurus sp. (catfish and bullheads)	0	0	0	0	2(1)	0
Polydictus olivarus (flathead catfish)	0	0	0	1(1)	0	0
Lepomis sp. (sunfish)	0	0	0	0	1(1)	0
Centrarchidae (sunfish, bass, crappie)	0	0	0	10	0	0
Amia calva (bowfin)	0	0	0	0	1(1)	0
Unidentified fish	1	0	0	52	90	1
Unidentified amphibian	0	0	0	3	0	0
Unidentified turtle	0	0	0	2	8	0
Unidentified bird	0	1	0	5	0	1
Sciurus spp. (tree squirrel)	0	0	0	1(1)	0	0
Odocoileus virginianus (white-tailed deer)	0	1(1)	1(1)	0	0	0
Small mammal	0	0	1	23	0	1
Large mammal	0	3	25	33	3	0
Unidentified mammal	0	0	2	5	1	0
Vertebrate	6	0	0	245	3	0
Total	7	6	29	401	112	3

[a]Flotation sample. [b]General excavation and flotation sample combined.

Table 9-4. Faunal Remains from Shallow Basins 6 Through 62.

Taxa	F 6[a]	F 7	F 15	F 16	F 22	F 27	F 31	F 34	F 36[a]	F 55	F 62
Ictiobus cyprinellus (bigmouth buffalo)	0	0	0	0	0	0	0	0	1(1)	0	0
Catostomidae (suckers)	0	0	0	0	0	0	0	0	4	2	0
Ictalurus punctatus (channel catfish)	0	0	0	0	0	0	0	0	1(1)	0	0
Ictalurus spp. (catfish and bullheads)	0	0	0	0	0	0	0	0	1(1)	0	0
Centrarchidae (sunfish, bass, crappie)	0	0	0	0	0	0	0	0	5	0	0
Amia calva (bowfin)	0	0	0	0	0	0	0	0	2(1)	0	0
Unidentified fish	1	0	0	1	0	0	0	0	132	0	0
Unidentified amphibian	0	0	0	0	0	0	0	0	1	0	0
Unidentified turtle	0	0	0	0	0	0	0	0	1	0	0
Anas sp. (dabbling ducks)	0	0	0	0	0	0	0	0	2(2)	0	0
Quisquilus quisquilus (grackle)	0	0	0	0	0	0	0	0	1(1)	0	0
Passeriformes (songbirds)	0	0	0	0	0	0	0	0	0	1	0
Unidentified bird	0	0	0	3	0	0	0	0	23	1	0
Sciurus carolinensis (gray squirrel)	0	0	0	0	0	0	0	0	1(1)	0	0
Sciurus sp. (tree squirrel)	0	0	0	0	0	0	0	0	1(1)	0	0
Geomys bursarius (Plains pocket gopher)	0	0	0	0	0	0	0	0	1(1)	0	0
Odocoileus virginianus (white-tailed deer)	0	0	0	0	0	0	0	0	5(2)	1(1)	0
Small mammal	0	0	0	0	0	0	0	0	10	0	0
Medium mammal	0	0	0	0	0	0	0	0	2	0	0
Large mammal	3	0	3	2	8	4	0	1	72	10	2
Unidentified mammal	0	0	0	0	0	1	0	0	4	0	0
Vertebrate	1	1	3	0	0	0	1	0	223	0	0
Total	5	1	29	6	8	5	1	1	593	15	2

[a]General excavation and flotation samples combined.

Table 9-5. Faunal Remains from Shallow Basins 65 Through 129.

Taxa	F 65	F102	F 103[a]	F104	F106	F109	F111	F115	F120	F123	F127	F129
Unidentified mussel	0	0	0	0	0	0	0	0	1	0	0	2
Unidentified fish	0	0	1	0	0	1	0	0	0	0	0	5
Terrapene sp. (box turtle)	0	0	0	0	0	0	0	0	0	0	0	1(1)
Unidentified turtle	0	0	0	0	0	1	0	0	0	0	0	2
Anas sp. (dabbling duck)	0	0	0	0	0	1(1)	0	0	0	0	0	0
Ectopistes migratorius (passenger pigeon)	0	0	0	0	0	0	0	1(1)	1(1)	0	0	0
Unidentified bird	0	0	0	0	0	0	0	2	2	0	1	1
Sciurus niger (fox squirrel)	0	0	0	0	0	0	0	0	1(1)	0	0	0
Sciurus spp. (tree squirrel)	0	0	0	0	0	0	0	0	1(1)	0	0	1(1)
Odocoileus virginianus (white-tailed deer)	0	0	0	0	0	0	0	0	0	0	0	2(1)
Large mammal	1	7	3	1	1	4	1	0	32	0	1	15
Unidentified mammal	0	0	0	0	0	0	0	0	0	2	0	0
Vertebrate	0	0	8	0	0	2	0	0	0	0	0	1
Total	1	7	12	1	1	9	1	3	38	2	2	30

[a]Flotation sample only.

Table 9-6. Faunal Remains from Shallow Basins 132 Through 232.

Taxa	F132	F133	F147	F150	F160	F163[a]	F164	F206	F225	F226	F230	F232
Unidentified mussel	0	0	0	6	1	0	0	18	0	0	0	0
Unidentified fish	2	0	0	0	0	0	0	1	4	0	0	0
Unidentified turtle	1	0	0	0	1	0	0	0	0	0	0	0
Unidentified bird	0	0	0	0	3	1	0	0	0	0	1	0
Sciurus niger (fox squirrel)	0	0	0	0	0	0	0	1(1)	0	0	0	0
Sciurus sp. (tree squirrel)	0	0	0	0	0	0	0	0	0	1(1)	0	0
Mustela vison (mink)	0	0	0	0	1(1)	0	0	0	0	0	0	0
Procyon lotor (raccoon)	0	0	0	0	0	0	1(1)	0	0	0	0	0
Odocoileus virginianus (white-tailed deer)	0	0	0	0	2(1)	0	0	0	0	1(1)	0	1(1)
Large mammal	0	1	4	1	6	0	2	0	0	1	0	0
Unidentified mammal	0	0	0	0	0	0	3	0	0	0	4	0
Vertebrate	0	0	0	0	0	2	0	0	0	1	0	0
Total	3	1	4	7	13	3	6	20	4	4	5	1

[a]Flotation sample only.

Table 9-7. Faunal Remains from Bell-Shaped Pits 1/2 Through 142.

Taxa	F1/2	F 21[a]	F 64[a]	F 77	F 79[a]	F 80[a]	F 82[a]	F 89	F 122[a]	F 126	F 135	F 142
Unidentified gastropod	0	1	2	0	1	0	0	0	0	0	0	0
Unidentified mussel	0	4	49	0	12	0	1	0	0	0	0	3
Quadrula sp.	0	0	0	0	1(1)	0	0	0	0	0	0	0
Amia calva (bowfin)	0	6(2)	0	0	5(3)	0	0	0	0	0	0	0
Ictiobus cyprinellus (bigmouth buffalo)	0	0	1(1)	0	0	0	0	0	0	0	0	0
Carpiodes cyprinus (quillback)	0	0	1(1)	0	0	0	0	0	0	0	0	0
Catostomidae (suckers)	0	1	0	0	6	0	1	0	0	0	0	0
Ictalurus melas (black bullhead)	0	1(1)	1(1)	0	1(1)	0	0	0	0	0	0	0
Ictalurus nebulosus (brown bullhead)	0	2(1)	2(1)	0	9(2)	0	0	0	0	0	0	0
Ictalurus natalis (yellow bullhead)	0	0	0	0	2(1)	0	0	0	0	0	0	0
Ictalurus punctatus (channel catfish)	0	0	0	0	1(1)	0	0	0	0	0	0	0
Ictalurus furcatus (blue catfish)	0	0	0	0	1(1)	0	0	0	0	0	0	0
Ictalurus spp. (catfish and bullheads)	0	6(2)	1(1)	0	16(1)	0	1(1)	0	0	0	0	0
Micropterus punctatus (spotted bass)	0	0	0	0	1(1)	0	0	0	0	0	0	0
Micropterus dolomieui (smallmouth bass)	0	0	0	0	3(2)	0	0	0	0	0	0	0
Micropterus salmoides (largemouth bass)	0	0	0	0	13(3)	0	0	0	0	0	0	0
Micropterus spp. (bass)	0	2(1)	0	0	8(1)	0	0	0	0	0	1(1)	0
Lepomis sp. (sunfish)	0	2(1)	0	0	0	0	0	0	0	0	0	0
Pomoxis annularis (white crappie)	0	0	0	0	4(2)	0	0	0	0	0	0	0
Pomoxis nigromaculatis (black crappie)	0	0	0	0	1(1)	0	0	0	0	0	0	0
Ambloplites rupestris (rock bass)	0	0	0	0	2(2)	0	0	0	0	0	0	0
Pomoxis sp. (crappies)	0	0	0	0	1(1)	0	0	0	0	0	0	0
Centrarchidae (sunfish, bass, crappie)	0	26	9	0	27	0	1	0	1	0	0	0
Aplodinotus grunniens (drum)	0	5(1)	2(1)	0	1(1)	0	0	0	0	0	0	0
Unidentified fish	15	218	25	0	157	5	12	0	35	0	0	1
Unidentified amphibian	0	0	0	0	0	1	0	0	0	0	0	0
Amphibian/Reptile	0	0	0	0	1	0	0	0	0	0	0	0
Ancistrodon contortrix (copperhead)	0	0	0	0	1(1)	0	0	0	0	0	0	0

[a]General excavation and flotation sample combined.

Table 9-7. Concluded.

Taxa	F1/2	F 21[a]	F 64[a]	F 77	F 79[a]	F 80[a]	F 82[a]	F 89	F 122[a]	F 126	F 135	F 142
Nonpoisonous snake	0	0	0	0	8	0	0	0	0	0	0	0
Trionyx sp. (softshell turtle)	0	0	0	0	12(1)	0	0	0	0	0	0	0
Terrapene sp. (box turtle)	0	0	0	1(1)	1(1)	0	0	0	0	0	0	0
Unidentified turtle	0	13	1	0	3	0	0	0	1	0	0	1
Anas spp. (dabbling duck)	0	0	1(1)	0	14(2)	0	0	0	0	0	0	0
Chen caerulescens (snow goose)	0	0	0	0	1(1)	0	0	0	0	0	0	0
Tympanuchus cupido (Greater Prairie Chicken)	0	1(1)	0	0	0	0	0	0	0	0	0	0
Meleagris gallopavo (turkey)	0	0	0	0	0	1(1)	0	0	0	0	0	0
Ectopistes migratorius (passenger pigeon)	0	0	0	0	0	1(1)	0	0	0	0	0	0
Picidae (woodpeckers)	0	0	0	0	1	0	0	0	0	0	0	0
Passeriformes (songbirds)	0	0	0	0	4	0	0	0	0	0	0	1
Unidentified bird	1	29	12	1	34	12	14	0	5	0	1	1
Blarina sp. (shrew)	0	0	0	0	1(1)	0	0	0	0	0	0	0
Scalopus aquaticus (eastern mole)	0	0	18(1)	0	0	0	0	0	0	0	0	0
Sciurus carolinensis (gray squirrel)	0	1(1)	0	0	1(1)	0	0	0	0	0	0	0
Sciurus niger (fox squirrel)	0	1(1)	0	0	0	0	0	0	0	0	0	0
Sciurus spp. (tree squirrel)	0	1(1)	2(2)	0	0	0	0	0	0	0	0	0
Geomys bursarius (Plains pocket gopher)	0	6(2)	0	0	19(3)	0	0	0	0	0	0	0
Sylvilagus spp. (rabbit)	0	3(1)	1(1)	0	2(1)	0	0	1(1)	0	0	0	0
Odocoileus virginianus (white-tailed deer)	1(1)	3(1)	4(1)	5(1)	12(1)	1(1)	6(1)	1(1)	1(1)	2(1)	0	7(1)
Cervus canadensis (wapiti)	0	0	0	0	2(1)	0	0	0	0	0	0	0
Small mammal	0	23	1	0	16	0	2	0	3	0	0	0
Medium mammal	3	4	0	0	1	5	2	0	0	0	0	1
Large mammal	5	10	100	24	134	20	19	1	11	2	2	16
Unidentified mammal	0	9	4	0	1	6	1	0	0	0	0	0
Vertebrate	2	156	24	1	75	8	13	12	26	0	8	1
Total	27	531	261	31	620	58	73	15	83	4	12	32

[a]General excavation and flotation samples combined.

Table 9-8. Faunal Remains from Bell-Shaped Pits 154 Through 266.

Taxa	F 154[a]	F 165	F 170	F 179	F 210	F 223	F 224	F 233	F 235[a]	F 255	F 264	F 266
Unidentified mussel	0	8	0	0	0	0	0	0	0	1	0	2
Lepisosteus sp. (gar)	4(1)	0	0	0	0	0	0	0	0	0	0	0
Amia calva (bowfin)	2(2)	0	0	0	0	0	0	0	0	1(1)	0	0
Ictiobus cyprinellus (bigmouth buffalo)	4(1)	0	0	0	0	0	0	0	0	0	0	0
Catostomidae (suckers)	29	1	0	0	0	0	0	0	1	0	0	0
Ictalurus nebulosus (brown bullhead)	5(3)	0	0	0	0	0	0	0	0	0	0	0
Ictalurus natalis (yellow bullhead)	3(1)	0	0	0	0	0	0	0	0	0	0	0
Ictalurus punctatus (channel catfish)	1(1)	0	0	0	0	0	0	0	0	0	0	1(1)
Ictalurus spp. (catfish and bullheads)	51(2)	0	0	0	0	0	0	0	0	0	0	1(1)
Micropterus salmoides (largemouth bass)	1(1)	1(1)	0	0	0	0	0	0	0	0	0	0
Micropterus sp. (bass)	4(3)	0	0	0	0	0	0	0	0	0	0	0
Lepomis gibbosus (pumpkinseed)	1(1)	0	0	0	0	0	0	0	0	0	0	0
Lepomis sp. (sunfish)	1(1)	0	0	0	0	0	0	0	0	0	0	0
Pomoxis annularis (white crappie)	1(1)	0	0	0	0	0	0	0	0	0	0	0
Centrarchidae (sunfish, bass, crappie)	87	0	0	0	0	0	0	0	2	0	0	0
Aplodinotus grunniens (drum)	2(1)	0	0	0	0	0	0	0	0	0	0	0
Unidentified fish	998	2	0	0	0	0	0	0	3	0	0	0
Rana catesbiana (bullfrog)	4(1)	0	0	0	0	0	0	0	0	0	0	0
Unidentified snake	0	0	0	0	0	0	0	0	2	0	0	0
Trionyx sp. (softshell turtle)	0	0	0	0	0	0	0	1(1)	0	0	0	0
Unidentified turtle	7	1	0	0	0	0	0	0	0	0	0	1
Anas spp. (dabbling duck)	3(1)	1(1)	0	0	1(1)	2(1)	0	0	0	0	0	0
Passeriformes (songbirds)	12	0	0	0	0	0	0	0	1	0	0	0
Unidentified bird	7	5	1	0	0	0	0	2	29	3	0	1
Sciurus niger (fox squirrel)	0	0	0	0	0	0	0	0	1(1)	0	0	0
Sciurus sp. (tree squirrel)	0	0	0	0	0	0	0	0	1(1)	0	0	0
Sylvilagus sp. (rabbit)	0	0	0	0	0	0	0	0	0	1(1)	0	0
Odocoileus virginianus (white-tailed deer)	21(2)	2(1)	0	0	0	1(1)	0	2(1)	0	2(1)	0	3(1)
Small mammal	3	0	0	0	1	0	0	0	14	1	0	0
Medium mammal	2	0	0	0	0	0	0	0	1	4	0	0
Large mammal	9	21	0	14	10	18	1	3	4	17	2	10
Unidentified mammal	0	1	0	0	0	0	0	0	26	3	0	5
Vertebrate	44	0	0	5	0	0	0	0	114	2	0	3
Total	1,006	43	2	19	12	21	0	8	198	36	2	27

[a]General excavation and flotation samples combined.

Table 9-9. Faunal Remains from Single-Post-and-Basin Structures 23 Through 119.

Taxa	F 23	F 38	F 40	F 42	F 48	F 90	F 107	F 119[a]
Unidentified mussel	18	0	0	0	7	0	0	38
Elliptio spp.	2(2)	0	0	0	0	0	0	0
Lampsilis sp.	1(1)	0	0	0	0	0	0	0
Actonaias sp.	1(1)	0	0	0	0	0	0	0
Lepisosteus sp. (gar)	1(1)	0	0	0	0	0	0	0
Dorosoma cepedianum (gizzard shad)	1(1)	0	0	0	0	0	0	0
Amia calva (bowfin)	3(1)	0	0	0	0	0	0	1(1)
Ictiobus cyprinellus (bigmouth buffalo)	1(1)	0	0	0	0	0	0	0
Ictiobus bubalus/niger (smallmouth/black buffalo)	1(1)	0	0	0	0	0	0	0
Ictiobus sp. (buffalo)	1(1)	0	0	0	0	0	0	0
Moxostoma sp. (redhorse)	2(1)	0	0	0	0	0	0	0
Catostomidae (suckers)	15	0	0	0	0	0	0	1
Ictalurus melas (black bullhead)	4(2)	0	0	0	0	0	0	0
Ictalurus nebulosus (brown bullhead)	12(2)	0	0	0	0	0	0	0
Ictalurus natalis (yellow bullhead)	2(1)	0	0	0	0	0	0	0
Ictalurus punctatus (channel catfish)	2(1)	0	0	0	0	0	0	0
Ictalurus furcatus (blue catfish)	2(1)	0	0	0	0	0	0	0
Ictalurus sp. (catfish and bullheads)	10(1)	0	0	0	0	0	0	0
Centrarchidae (sunfish, bass, crappie)	3	0	0	0	0	0	0	15
Aplodinotus grunniens (drum)	0	0	0	0	0	0	0	1(1)
Unidentified fish	80	0	0	0	0	0	1	27
Unidentified amphibian	4	0	0	0	0	0	0	0

[a]General excavation and flotation samples combined.

Table 9-9. Concluded.

Taxa	F 23[a]	F 38	F 40	F 42	F 48	F 90	F 107	F 119[a]
Nonpoisonous snake	3	0	0	0	0	0	0	0
Unidentified snake	3	0	0	0	0	0	0	0
Terrapene sp. (box turtle)	1(1)	0	0	0	0	0	0	0
Unidentified turtle	11	0	0	0	0	0	0	0
Podiceps podylimbus (pie-billed grebe)	1(1)	0	0	0	0	0	0	0
Rallidae (rails)	0	0	0	0	0	0	0	1
Colinus virginianus (bobwhite)	5(1)	0	0	0	0	0	0	2(1)
Meleagris gallopavo (turkey)	1(1)	0	0	0	0	0	0	0
Ectopistes migratorius (passenger pigeon)	1(1)	0	0	0	0	0	0	0
Passeriformes (songbirds)	2	0	0	0	0	0	0	0
Unidentified bird	69	0	0	0	2	1	0	8
Sciurus niger (fox squirrel)	1(1)	0	0	0	0	0	0	0
Sciurus sp. (tree squirrel)	2(2)	0	0	0	0	0	0	0
Geomys bursarius (Plains pocket gopher)	3(1)	0	1(1)	0	1(1)	0	0	0
Sylvilagus sp. (rabbit)	2(1)	0	0	0	0	0	0	0
Mustela vison (mink)	1(1)	0	0	0	0	0	0	0
Vulpes fulva (red fox)	0	0	0	0	0	0	0	1(1)
Odocoileus virginianus (white-tailed deer)	17(1)	0	0	0	0	1(1)	1(1)	5(1)
Small mammal	19	0	0	0	0	0	0	3
Medium mammal	4	0	0	0	5	7	0	1
Large mammal	121	0	1	3	8	0	0	23
Unidentified mammal	31	0	2	0	0	1	0	5
Vertebrate	161	0	0	0	0	0	0	20
Total	625	1	4	3	16	10	2	152

[a]General excavation and flotation samples combined.

Table 9-10. Faunal Remains from Single-Post-and-Basin Structures 128 Through 269.

Taxa	F128	F141	F159	F177[a]	F178	F221[b]	F222	F269[b]
Unidentified mussel	0	0	0	0	5	8	0	0
Amia calva (bowfin)	0	0	0	0	0	1(1)	0	1(1)
Catostomidae	0	0	0	0	0	3	0	0
Ictalurus spp. (catfish and bullheads)	0	0	0	1(1)	0	0	0	1(1)
Centrarchidae (sunfish, bass, crappie)	0	0	0	0	0	0	0	7
Unidentified fish	0	0	0	1	1	44	0	13
Unidentified amphibian	0	0	0	0	0	1	0	1
Chrysemys sp. (pond turtles)	0	0	0	0	0	0	0	1(1)
Unidentified turtle	0	0	3	0	0	1	0	0
Unidentified bird	0	0	0	0	0	4	0	3
Odocoileus virginianus (white-tailed deer)	2(1)	1(1)	0	0	2(1)	3(1)	0	2(1)
Large mammal	2	4	1	0	48	27	1	2
Unidentified mammal	0	0	2	2	0	7	0	1
Vertebrate	0	0	2	5	1	20	3	11
Total	4	5	8	9	57	120	4	43

[a]Flotation sample only.

[b]General excavation and flotation samples combined.

feature is from bell-shaped pits and deep basins, averaging 26 and 24 elements per feature, respectively. In contrast, shallow and medium basins average only one element per feature. These remains represent minimally 21 different species from seven different families.

Most common is the sunfish family (Centrarchidae). Sunfish remains constitute 46 percent of all identified fish elements and are represented by at least seven species. Most common of all the identified sunfish is the largemouth bass (*Micropterus salmoides*). This species is tolerant of a wide range of habitats, from large rivers to streams and from ponds to swamps (Smith 1979). The remaining sunfish species tend to be more common in rivers and streams (Smith 1979). Next most common is the catfish family (Ictaluridae). Catfish, represented by six different species, comprise 27 percent of the identified fish elements. Most common are brown bullheads (*Ictalurus nebulosus*), black bullheads (*Ictalurus melas*), and yellow bullheads (*Ictalurus natalis*), all of which prefer lake, pond, or swamp habitats (Smith 1979). Less common are catfish species that prefer river or river channel habitats such as the channel catfish (*Ictalurus punctatus*), blue catfish (*Ictalurus furcatus*), and flathead catfish (*Polydictus olivaris*). Suckers (Catostomidae) are the other well-represented family of fish at Stemler Bluff. Suckers constitute 15 percent of the identified fish and are represented minimally by four species. All of the identified species can be found in backwater lakes and oxbows of large rivers (Smith 1979).

Table 9-11. Faunal Remains from Wall-Trench Structures, Unidentified Features, and Surface.

Taxa	F 9/158[a] (WT)	F 96[a] (WT)	F 236[a] (WT)	F 151 (UN)	F 130 (UN)	F 229[a] (UN)	Surface
Unidentified mussel	0	0	0	3	0	18	0
Megalonais gigantia	0	0	0	1(1)	0	0	0
Lampsilis sp.	0	0	0	1(1)	0	0	0
Lepisosteus sp. (gar)	0	0	0	0	0	3(1)	0
Amia calva (bowfin)	0	0	0	0	0	3(1)	0
Ictiobus cyprinellus (bigmouth buffalo)	0	0	0	0	0	1(1)	0
Ictiobus niger (black buffalo)	0	0	0	1(1)	0	0	0
Ictiobus spp. (buffalo)	0	0	0	0	0	2(2)	0
Carpiodes cyprinus (quillback)	0	0	0	0	0	1(1)	0
Catostomidae (suckers)	0	0	1	0	0	2	0
Ictalurus melas (black bullhead)	0	0	0	0	0	1(1)	0
Ictalurus nebulosus (brown bullhead)	0	0	0	1(1)	0	2(1)	0
Ictalurus natalis (yellow bullhead)	0	0	0	0	0	1(1)	0
Ictalurus punctatus (channel catfish)	0	0	0	0	0	3(2)	0
Ictalurus sp. (catfish and bullheads)	0	0	0	1(1)	0	4(1)	0
Micropterus salmoides (largemouth bass)	0	0	0	1(1)	0	1(1)	0
Micropterus sp. (bass)	0	0	0	1(1)	0	0	0
Centrarchidae (sunfish, bass, crappie)	0	3	0	0	0	17	0
Aplodinotus grunniens (drum)	0	0	0	0	0	1(1)	0
Unidentified fish	0	19	0	2	0	92	0
Terrapene sp. (box turtle)	0	0	0	1(1)	0	0	0
Trionyx sp. (softshell turtle)	0	0	0	0	0	1(1)	0
Unidentified turtle	0	2	0	3	0	21	1
Anas sp. (dabbling duck)	0	0	0	0	0	3(1)	0
Colinus virginianus (bobwhite)	0	0	0	1(1)	0	0	0
Phasianus colchicus (pheasant)	0	0	0	0	0	0	4(1)
Zenaida macroura (mourning dove)	0	0	0	1(1)	0	2(1)	0
Ectopistes migratorius (passenger pigeon)	0	0	0	0	0	1(1)	0
Picidae (woodpeckers)	1	0	0	0	0	0	0
Passeriformes (songbirds)	0	0	0	1	0	0	0
Unidentified bird	8	0	1	3	0	13	9
Odocoileus virginianus (white-tailed deer)	0	0	1(1)	4(1)	0	1(1)	1(1)
Small mammal	0	0	0	3	0	1	0
Medium mammal	0	0	0	1	0	1	0
Large mammal	0	4	5	6	0	18	0
Unidentified mammal	0	2	0	1	1	3	0
Vertebrate	1	25	1	4	0	52	3
Total	10	55	9	41	1	269	18

[a]General excavation and flotation samples combined.

No other family of fish contributes more than five percent of the identified fish remains. Of the four other families identified, gar (Lepisosteidae) are most common, followed by bowfin (*Amia calva*), drum (*Aplodinotus grunniens*), and shad (*Dorosoma cepedianum*). Most are large river or backwater lake and oxbow species.

This overview suggests that minimally two, and possibly three different habitats were being exploited for fish by the Stemler Bluff inhabitants. Most common in the assemblage are species adapted to floodplain lakes, swamps, and oxbows including largemouth bass, bullheads, suckers, and bowfin. Moredock Lake, a backwater lake on the Mississippi River floodplain, is located 2–2.5 km northwest of Stemler Bluff. Fewer elements from species adapted to large river channels are present in the assemblage. This could indicate that the Mississippi River was only incidentally fished, although such species also may have been transported out of their usual habitat during floods. The main channel of the Mississippi River is currently 6.5 km west of Stemler Bluff. Finally, a few species present in the assemblage are more tolerant of smaller rivers or streams. Such a habitat may be nearby Fountain Creek, located 4.5 km to the north or Bond Creek, 1 km to the east, although many of the species also could have been present in either the Mississippi River shallows or in floodplain lakes and ponds.

Mammals

Mammals are the second-most common class present in the Stemler Bluff assemblage. Mammal remains comprise 27 percent of the entire assemblage but only 22 percent of the identified elements. Mammal elements were recovered from 83 of 93 features, or 89 percent. The average number of mammal elements is highest for bell-shaped pits ($\bar{x}$=23), although mammal remains are also common in structures ($\bar{x}$=17) and medium basins ($\bar{x}$=15). The mammal remains represent minimally 11 different species.

For the purposes of this analysis mammal remains were divided into large, medium, and small categories. Large mammal remains are most common, comprising 83 percent of mammal remains that could be classified on the basis of size. Only two large mammal species were identified. White-tailed deer (*Odocoileus virginianus*) is most common while two specimens were identified as wapiti (*Cervus canadensis*). White-tailed deer and wapiti prefer forest-edge to forested areas, although both tend to be highly tolerant of habitat (Jones and Birney 1988; Skovlin 1982). Few medium-sized mammals were identified in the assemblage. Only four percent of the size-classified mammal elements were assigned to this category, although four species were identified. Most common is the rabbit (*Sylvilagus* spp.), most probably the eastern cottontail rabbit, although the elements could also represent the floodplain-adapted swamp rabbit. Mink (*Mustela vison*), raccoon (*Procyon lotor*), and red fox (*Vulpes fulva*) also were identified in small numbers. Most of these species inhabit a variety of habitats, although the mink prefers wetlands (Jones and Birney 1988). Small mammal remains comprise 13 percent of the elements classified by size, with five species identified. Most common is the Plains pocket gopher (*Geomys bursarius*). Both gray (*Sciurus carolinensis*) and fox (*Sciurus niger*) squirrels are present in the assemblage in small numbers. One feature (Feature 64) contained the only remains of the eastern mole (*Scalopus aquaticus*) identified in the assemblage and may represent an incidental inclusion.

Unlike the fish assemblage, it is difficult to characterize the habitats exploited by the Stemler Bluff inhabitants while hunting. Clearly, white-tailed deer were the primary focus of hunting activities, with medium to small mammals probably being taken on an as-encountered basis. This would suggest forest-edge areas were hunted, although white-tailed deer are not uncommon in open forest habitats. White-tailed deer most likely were taken in the uplands in the vicinity of Stemler Bluff.

Birds

Birds are the third most common class in the Stemler Bluff assemblage, constituting six percent of the entire assemblage and eight percent of the identified remains. Bird remains were found in 45 features, or in 48 percent of features with faunal remains. Average number of bird elements is highest in unidentified features ($\bar{x}$=7), bell-shaped pits ($\bar{x}$=6) and structures ($\bar{x}$=4), but average less than one element for each of the three basin types. Minimally 11 different species were identified.

The species identified in the Stemler Bluff assemblage can be divided into three groups: waterfowl, terrestrial-oriented species, and pigeons and songbirds. Most common are various waterfowl species, comprising 41 percent of the identified bird elements. These include ducks (*Anas* spp.) and snow geese (*Chen caerulescens*) as well as rails (Rallidae) and pied-billed grebes (*Podilymbus podiceps*). Ducks are most common in the assemblage. All species could be found along the floodplain of the Mississippi River, a major migratory flyway for ducks and geese (Bellrose 1976). Duck and snow goose migration through the American Bottom occurs between February and April and October through December (Bellrose 1976). Pigeons and songbirds are next most common, with 33 percent of the identified remains attributed to songbirds, either unidentified songbird, woodpecker (Picidae) or grackle (*Quisquilus quisquilus*), and 11 percent to pigeons (Columbidae). Pigeon remains include passenger pigeon (*Ectopistes migratorius*) and mourning dove (*Zenaida macroura*). Terrestrial species are least common, comprising 11 percent of the identified bird elements. Most common are northern bobwhites (*Colinus virginianus*), although turkey (*Meleagris gallopavo*) and greater prairie chicken (*Tympanuchus cupido*) also were identified. These species prefer a wide range of habitats from prairies to open woodlands and forest edges (Ehrlich et al. 1988). A possible source for these may have been the floodplain prairie depicted on an early nineteenth century GLO map near the base of the bluff west of Stemler Bluff (see Figure 2-4, Volume 1).

The bird species suggest that the Stemler Bluff occupants hunted on the floodplain of the Mississippi River, which is prime habitat for migrating waterfowl during spring and fall while terrestrial species could be taken in the floodplain prairie year-round. Songbirds may have been incidental or used for feathers. The passenger pigeon, now extinct, is a common component of archaeological faunal assemblages throughout the Midwest. This species preferred forest habitats (Ehrlich et al. 1988) and would have been present along the bluff crest.

Reptiles and Amphibians

This class is poorly represented in the Stemler Bluff faunal assemblage. It accounts for just two percent of all elements but 13 percent of all identified remains. Reptile or amphibian elements were recovered from 28, or 30 percent, of the features. Minimally, six different species were identified, one amphibian and five reptile. Most common are softshell turtles (*Trionyx* spp.), a species common in rivers and streams (Behler and King 1979). A single pond turtle (*Chrysemys* sp.) element, also a common river or lake taxon, was identified (Behler and King 1979). Box turtles (*Terrapene* spp.), also present in the assemblage, inhabit moist forest and prairie areas (Behler and King 1979). Nonpoisonous snakes and copperhead (*Ancistrodon contortrix*) would have been present along the bluff crest (Behler and King 1979) and may have been hunted incidentally or killed as vermin. While constituting a small assemblage, the reptile and amphibian remains indicate use of the floodplain and the immediate surrounding bluff crest area. It is likely that many of these species were taken incidentally to other hunting or fishing activities.

Mussels and Gastropods

Mussels and gastropods are also poorly represented in the Stemler Bluff faunal assemblage. This group constitutes four percent of the entire assemblage but less than one percent of all identified elements. This is due, in most part, to poor preservation and shell fragility. Mussels and gastropods were recovered from 22 features, or 24 percent of the features with faunal remains. Minimally, five different mussel taxa were identified. All of the identified species are present in small to large or solely in large rivers (Parmalee 1967). The Stemler Bluff mussels could have been collected either from the Mississippi River or Fountain Creek and may have been taken incidentally to other tasks. The few gastropods recovered were not identified.

Interassemblage Temporal Patterning

One goal of the analysis of the Stemler Bluff faunal remains is to examine changes in exploitation patterns through time within the assemblage. To accomplish this, the faunal remains from features, dated for the most part by ceramic attributes, were grouped by time period for comparison. This resulted in a faunal sample from one feature dating to the Late Woodland, 19 Emergent Mississippian period features, and two Mississippian period features. The remaining features lacked either faunal remains or ceramic or other temporal attributes that would allow dating of the feature to one of these three time periods. As such, the sample sizes for the Late Woodland and Mississippian periods are small, with a NISP of less than 100 each, and hence may be skewed due to sample size vagaries.

The taxonomic level of comparison undertaken here is that of class. The aggregate NISP of all features for each of the three time periods was calculated and converted to a percentage of the total NISP for that particular time period. Elements identified only as vertebrate were not included in the total. The Late Woodland sample totaled 32, the Emergent Mississippian sample 1,297, and the Mississippian sample 54.

Table 9-12 presents the results of analysis. Three trends are apparent. First, fish exploitation decreases through time. Second, bird exploitation increases through time. Finally, mammal exploitation also increases through time. When the remainder of the undated faunal assemblage is aggregated in a similar manner, the class profile is most similar to that of the Emergent Mississippian features (Table 9-12). The two major differences are that fish comprise a slightly higher percentage of the undated assemblage than that for the Emergent Mississippian while mammals comprise a slightly smaller percentage. It should be emphasized that the small sample sizes for the Late Woodland and Mississippian assemblages make the above noted trends suspect.

Intrasite Temporal and Physiographic Patterning

A major goal of this faunal analysis is to compare the Stemler Bluff assemblage with that of other Emergent Mississippian and Mississippian period sites in the American Bottom. This comparative analysis centers on potential changes in faunal exploitation patterns between the Emergent Mississippian and Mississippian periods, and between upland and floodplain sites. Excavation reports for the region were reviewed to identify sites with faunal assemblages from which data could be obtained for comparison. The data collected for each site includes time period (either Emergent Mississippian or Mississippian), physiographic setting (floodplain or uplands), and the percentage of fish, reptiles and amphibians, birds, and mammals in the assemblage. In addition, the percentage of white-tailed deer remains as a component of all mammal remains from the site was calculated. Data were available from 13 different components from 10 sites (Table 9-13). It also was assumed, based on the above discussion, that the Emergent Mississippian/Mississippian features and the temporally unknown features at Stemler Bluff date to the Emergent Mississippian period.

Table 9-12. Percentage of Stemler Bluff Faunal Classes by Time Period.

Class	Late Woodland	Emergent Mississippian	Mississippian	Unknown
Mussels	0	4	0	4
Fish	69	37	13	51
Reptiles and Amphibians	6	4	4	3
Birds	9	11	24	8
Mammals	16	44	59	34

Table 9-13. Percentage of Faunal Classes at Emergent Mississippian and Mississippian Sites in the American Bottom.

Site	Time Period	Location	Fish	Reptiles/ Amphibians	Birds	Mammals	Deer
Stemler Bluff	EM	Uplands	54	3	8	35	8
AG Church (Holt 1996)	M	Uplands	75	1	2	22	7
Julien (Cross 1984a)	M	Floodplain	56	3	12	29	3
Carbon Dioxide (Finney 1985)	M	Floodplain	80	<1	18	2	19
George Reeves (Cross 1987)	EM	Uplands	76	2	10	12	86
Range (L. Kelly 1990a, b)	EM	Floodplain	88	4	4	3	13
Sponemann (L. Kelly 1991)	EM	Floodplain	71	5	10	14	12
Robinson's Lake (Cross 1984b)	EM	Floodplain	17	1	70	12	4
Lohmann (Cross 1992)	M	Floodplain	46	3	23	29	37
Turner/DeMange (Cross 1983)	M	Floodplain	69	0	26	5	0
AG Church (Holt 1996)	EM	Uplands	35	2	11	52	9
Marge (Berres 1996)	EM	Floodplain	19	8	63	9	30
Sponemann (L. Kelly 1992)	M	Floodplain	20	1	5	74	11

Note: EM=Emergent Mississippian and M=Mississippian.

Multidimensional scaling analysis then was performed on the faunal assemblage data from the 13 sites. Multidimensional scaling is a data reduction technique using proximity among variables, or the similarity of variables, to produce a spatial display or configuration of points (Kruskal and Wish 1978). The similarity of variables (or proximities) is obtained by transforming the data into a correlation matrix. In this instance, sites with similar faunal assemblages should group together while those with dissimilar assemblages should remain apart. Multidimensional scaling then allows an examination of points to yield structural insights into patterns. Once plotted, variability along the dimensions can be analyzed in an exploratory manner. Interpretation can include all data points, take the form of a neighborhood or cluster approach, or both.

A Pearson correlation matrix of the data was created and analyzed using multidimensional scaling. Stress, or the goodness of fit for the analysis, is .07525, suggesting a fairly robust solution. The solution is presented graphically in Figure 9-1. The two dimensions appear to represent differences in percentage of fish and percentage of mammals in the assemblages. The first dimension separates sites with few mammal remains, such as Turner/DeMange, Marge, and Robinson's Lake, at the left of the plot from sites with a larger mammal component, such as Sponemann, AG Church, and Stemler Bluff, at the right of the plot. The second dimension separates sites on the basis of fish in the assemblage. Sites in the lower portion of the plot, mainly Marge, Robinson's Lake, and Sponemann (Mississippian component) have assemblages with less than 20 percent fish. The remainder of the assemblages all have greater percentages of fish and are plotted higher in this figure.

Of most importance to the current analysis is the lack of patterning with regards to physiographic setting or time period. Upland sites often have as much or more fish in faunal assemblages than do floodplain sites. The position of the upland sites at or near bluff edges apparently allowed their inhabitants access to floodplain lakes for fishing. A similar lack of physiographic patterning with regards to mammal remains suggests that site placement may have distinct goals with regards to faunal exploitation. Sites with low frequencies of mammal remains may represent attempts at more specialized procurement. For instance, the Marge assemblage has low frequencies of both mammals and fish but an unusually high amount of bird remains. Range has a low frequency of mammals but the highest frequency of all assemblages for fish. In this sense, sites with low frequencies of mammal remains may have been located to take advantage of other resources such as fish or birds. The other sites, with moderate frequencies of mammals, also tend to have more moderate frequencies of other animal classes. These sites appear to have been located in areas that maximized a diverse faunal exploitation strategy. Only one site, the Mississippian component at Sponemann, is dominated by mammals. It is at the extreme right of the scatterplot, indicating a high mammal frequency but relatively low frequency of fish. This component would appear to represent a strategy based not on overall class diversity but more so on mammals.

This pattern, including both specialized and diversified faunal assemblages, is characteristic of the Emergent Mississippian and Mississippian periods. It suggests, at least for the Emergent Mississippian and initial part of the Mississippian period, that a fairly stable faunal exploitation strategy was in place.

Bone Tools

Five bone tools were also found at the Stemler Bluff site (Plate 9-1). Three of the bone tools are from Feature 79, a bell-shaped pit. Two are splinter awls, one made from a mammal bone and the other from a bird bone fragment. The mammal-bone awl is 66-mm long, 6-mm wide, and 3-mm thick (Plate 9-1, a). The bird bone awl is 48-mm long, 4-mm wide, and 2-mm thick (Plate 9-1, b). Also found in

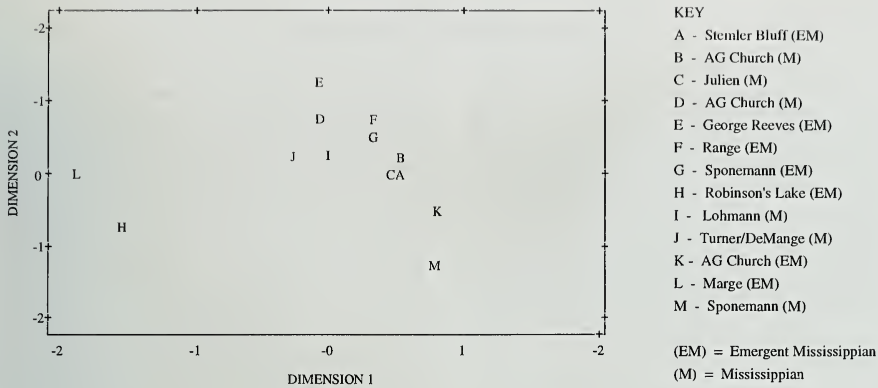

Figure 9-1. Multidimensional Scaling Analysis Scatterplot of American Bottom Faunal Assemblages.

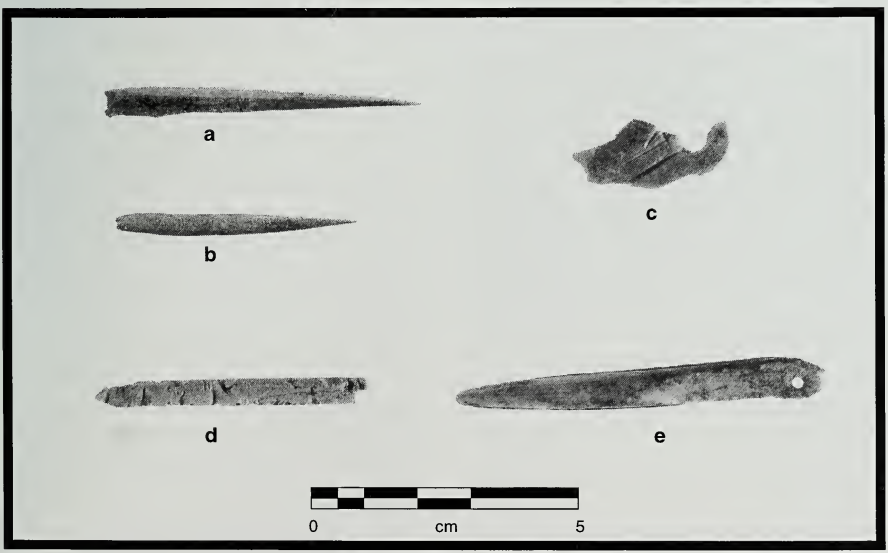

Plate 9-1. Bone Tools: a, Mammal-Bone Awl; b, Bird-Bone Awl; c, Mammal-Bone Fish Hook Blank; d, Cylindrical-Shaped Fragment; e, Mammal-Bone Awl or Needle.

Feature 79 was a fish hook blank fragment (Plate 9-1, c). This specimen, made from a mammal-bone fragment, has a portion of a drilled hole (ca. 6 mm in diameter) and numerous cut marks. A single piece of modified bone was recovered from Feature 5, a medium basin (Plate 9-1, d). This fragment is somewhat cylindrical in shape and measures 49-mm long and 4 to 5 mm in diameter. Many gnaw or cut marks are present on the piece, which appears to be an awl fragment. The final bone tool was found in Feature 133, a shallow basin (Plate 9-1, e). This piece is a complete awl or needle made from a mammal bone fragment. It measures 68-mm long, 7-mm wide, and 4-mm thick. A drilled hole is present at the end opposite its tapered point. On one side of this piece immediately beneath the drilled hole is a number of incisions. The incisions begin at each edge of the piece and extend inward approximately one-third of the way towards the center. One side has five and the other, seven.

CHAPTER 10.
DISCUSSION AND CONCLUSIONS

With the advent of the planned relocation of families, businesses, churches, and offices from the Village of Valmeyer on the floodplain of the Mississippi River to the bluff overlooking its current location, the Phase III mitigation of 11MO891 proved critical. The Phase III mitigation of this site was one of the many regulatory steps necessary in the attempt by FEMA to relocate the individuals and organizations devastated by the Great Flood of 1993 and thus reestablish the social fabric of the Village of Valmeyer. Against this backdrop, it was also critical to recover archaeological data present prior to the construction of houses, buildings, roads, and infrastructure on the site area and thus prevent the destruction of this irreplaceable resource. The Public Service Archaeology Program completed the Phase III mitigation of the 11MO891 site area within 1.5 months, enabling both the preservation of the archaeological data and the planned construction activities to proceed in a timely manner.

The Phase III mitigation of 11MO891 resulted in the identification of 219 prehistoric features and the recovery of over 100,000 artifacts and ecofacts. Especially important are the ample paleobotanical and faunal samples recovered through general excavation and soil flotation samples from the features as well as the data on the spatial patterning of the features themselves. The results of the excavations and artifact analyses have been presented in Chapters 4 through 9 of this volume. These chapters provide evidence concerning the occupation of the Stemler Bluff site during the Late Woodland, Emergent Mississippian, and Mississippian periods. This chapter returns to the topics originally discussed in Chapter 3 as a general research orientation for this project. Those topics address the ability of the data obtained from 11MO891 to contribute to the Emergent Mississippian and Mississippian period cultural chronology in the American Bottom, the identification of on-site activities, the identification of Emergent Mississippian and Mississippian subsistence strategies in the uplands surrounding the American Bottom, the function of 11MO891, the use of a sinkhole that is present on site, and the role of 11MO891 within the local settlement system. Based on the data presented in the previous chapters, the focus of these five research topics, when robust data are available, is on a comparison of the Stemler Bluff site, an upland occupation in the extreme southern portion of the American Bottom, to trends noted by the FAI-270 project for upland and floodplain sites in the American Bottom to the north.

Site Chronology

One of the research goals of the Stemler Bluff mitigation project was the recovery of data with which to date the site and place the occupation into a regional chronological framework. Accurate chronological placement of the site within the existing American Bottom late prehistoric cultural-chronological construct is essential to defining the proper archaeological context when addressing issues of site function, subsistence and settlement patterns, mortuary patterns, and technology. Three categories of data, charcoal samples submitted for radiometric assay, typological analysis of temporally diagnostic artifacts, and feature types, provide both chronometric and relative means of dating the Stemler Bluff occupations. The use of multiple chronometric and relative dating techniques at Stemler Bluff allows for each method to be used as a cross-check on the others. On the basis of the radiocarbon assays, the analysis of diagnostic artifacts, and feature types, the Stemler Bluff site contains multiple components that date from the Early Archaic through Mississippian periods. The oldest components are recognized by a limited number of diagnostic lithic tools while the more recent components are evident in all three categories of chronological data. The preponderance of data indicates that the principal site occupation dates to the Emergent Mississippian period. The material remains recovered from the Stemler Bluff site are generally comparable to other assemblages dating to the same time span in the southern American Bottom, indicating a correspondence with the established regional chronological framework.

Radiocarbon age determinations from 13 selected samples of wood charcoal recovered from features place the occupation of the site between roughly 1150 and 800 B.P. (Table 4-2), or during the Emergent Mississippian (1200–950 B.P.) and Mississippian (950–550 B.P.) periods. These dates fall within the range assigned to Emergent Mississippian Dohack, Range, George Reeves, and Lindeman phases as well as the Mississippian Lindhorst and Stirling phases for the southern American Bottom. The radiocarbon determinations do not provide evidence for earlier occupations. However, given the small number of features dated from the Stemler Bluff site, it is possible that any number of the 56 features that lacked ceramics may have been constructed prior to the Late Woodland period. Based on the radiocarbon determinations, the chronological focus of the Stemler Bluff site is the Emergent Mississippian and Mississippian periods.

Absolute dating techniques, such as radiocarbon age determinations, provide a range of dates in which an event probably occurred given a particular statistical level of certainty. The Stemler Bluff site radiocarbon assays typically have a range of 100 or more years and often cross-cut archaeological periods and phases. This confidence interval is of particular relevance in the American Bottom where late prehistoric phases have been defined in 50-year increments. The placement of excavated assemblages into the American Bottom cultural-chronological framework relies heavily on the analysis of the material remains and their context. Relative dating of the Stemler Bluff site was possible through diagnostic lithic artifacts, diagnostic ceramics, and the occurrence of particular feature types. Each line of evidence documents relative chronological determinations, but collectively all support the radiocarbon assay results that indicate that the focal occupation at Stemler Bluff occurred during the Emergent Mississippian period.

The Stemler Bluff lithic assemblage contains a number of temporally sensitive artifacts. Diagnostic projectile points were recovered from feature and nonfeature contexts that indicate the use of the site during every major cultural period except Paleoindian. Of the 13 pre-Late Woodland projectile points recovered in feature context, ten occurred with ceramics diagnostic of the Emergent Mississippian period, indicating redeposition or collection and reuse by later groups. Twenty-nine of the projectile points are small forms that are typical of the Late Woodland through the Mississippian periods. These points are believed to have been hafted onto arrow shafts. Bow and arrow technology did not become common in the American Bottom until the Late Woodland Patrick phase (Kelly, Finney, McElrath, and Ozuk 1984). The late prehistoric occupation of the site also is documented by the occurrence of four hoes, 82 hoe flakes, a stone bead, and a limestone pipe fragment. All of these items are diagnostic of an Emergent Mississippian or Mississippian site occupation (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984; Milner et al. 1984). Most of the raw material for these artifacts was obtained locally, and the lithic technology focused on expedient reduction systems. These traits are similar to previously documented Late Woodland through Mississippian period lithic technology patterns (Bareis and Porter 1984). The lithic technology patterns are therefore most typical of Emergent Mississippian components, but also are similar to Late Woodland and Mississippian patterns.

The ceramic assemblage recovered from Stemler Bluff includes a number of temporally sensitive attributes. Attributes such as temper type, vessel form, surface treatment, and decorative treatment are all recognized as important chronological indicators. Comparison of the Stemler Bluff ceramic assemblage with other American Bottom assemblages during late prehistoric times indicates strong similarities.

A general chronological trend noted in the American Bottom is a shift from grit or grog temper to limestone temper and subsequently to shell temper in the manufacture of ceramics. The shift to shell temper is less pronounced in the southern American Bottom than it is to the north. The shift may be technologically influenced, in that its importance lies in a need for carbonate temper, with limestone fulfilling this requirement as well as shell. These tempers can roughly be equated to three periods, with the Late Woodland period associated with the use of grit and grog temper, the Emergent Mississippian period with limestone temper, and the Mississippian period with shell temper. Based on the primary sherd temper, the Stemler Bluff assemblage is 86 percent limestone tempered, 12 percent grit or grog tempered, and 2 percent shell tempered. The paucity of shell temper does not indicate a lack of Mississippian occupation since the southern American Bottom retains a limestone tempering tradition during that period. The temper evidence indicates that the Stemler Bluff site has materials from all three periods, but with a preponderance of material associated with the Emergent Mississippian. This interpretation is overly simplistic since temper types persist from one period to the next, but it does provide a rough chronological guide.

A second general ceramic trend is the diversification and alteration of vessel forms. Vessel forms in the southern American Bottom during Late Woodland Patrick phase include jars, bowls, and pinch pots (Kelly, Finney, McElrath, and Ozuk 1984). During the Emergent Mississippian period the number of vessel types increases to include stumpware (Range phase), bottles (George Reeves phase), and seed jars (Lindeman phase) (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984). During the Mississippian period beakers, hooded water bottles, and funnels are added to assemblages (Milner et al. 1984). The new vessel forms and the changing proportion of vessel types provide rough chronological indicators. Similarly, jars demonstrate significant morphological changes in neck and rim shapes through time. Vessels with incurved necks and simple rims are known to be earlier than those with everted or rolled rims (Kelly 1990a; Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984). Likewise, vessel decoration on jars changes from entirely cordmarked exteriors to vessels with cordmarked bodies and plain necks to entirely plain vessels (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984). Additionally, there was a shift from S-twist to Z-twist cordage patterns on ceramics during the Late Woodland and Emergent Mississippian periods (Kelly, Finney, McElrath, and Ozuk 1984). For all of these ceramic traits the temporal change is one of frequency within an assemblage rather than their absolute presence or absence. The Stemler Bluff assemblage consists of only three vessel forms. Jars are the most dominant form, representing 62 percent of the assemblage, followed by bowls at 12 percent, and pinch pots at 3 percent. These vessel forms would be consistent with Late Woodland Patrick or more recent phases. Cordage patterns also support Patrick phase or more recent occupations in that 83 percent are Z-twist and 17 percent S-twist. Additionally, 29 percent of the vessels are cordmarked to the rim while the rest either have plain and cordmarked surfaces or plain surfaces. All of these ceramic attributes are consistent with occupation beginning during the Late Woodland Patrick phase and continuing into the Mississippian period.

As was noted in Chapter 5, the ceramic assemblage has vessel types that would be consistent with a Late Woodland Patrick phase to early Mississippian occupation. The vast majority of the assemblage falls within Emergent Mississippian types, with the mix of attributes most closely matching those reported for Lindeman phase (Kelly, Ozuk, Jackson, McElrath, Finney, and Esarey 1984). The site is clearly multicomponent and it is likely that Late Woodland, several Emergent Mississippian, and early Mississippian phases, are represented at Stemler Bluff.

As was noted for both the lithic and ceramic assemblages, most features at Stemler Bluff are not exclusively associated with a single phase or period. The well-documented shift from keyhole to single-post-and-basin at the end of the Late Woodland to the early part of the Emergent Mississippian period, to wall-trench structures during the Mississippian period, is partly represented at the site. No keyhole-shaped structures were located, but the other two house types are present at the site. In general, single-post-and-basin structures date to the Emergent Mississippian period while wall-trench structures are Mississippian. There are 22 single-post-and-basin structures and 3 wall-trench structures at Stemler Bluff, indicating the greater relative frequency of Emergent Mississippian occupations at the site. The Stemler Bluff post-and-basin structures have floor areas ranging from 3.3 to 8.5 m^2. This is similar to other Emergent Mississippian structures which typically have a 5-m^2 floor area. On the other hand, the Stemler Bluff wall-trench structures have floor areas ranging from 5.7 to 11.7 m^2. This size range is at the lower end of the Mississippian wall-trench floor area, where sizes exceeding 15 m^2 are common. The smaller sized wall-trench structures are most common during the early portion of the Mississippian period, particularly the Lindhorst or Lohmann phases. The rectangular structure shape is often associated with early Mississippian period phases.

Collectively, several lines of evidence provide for an internal chronology at Stemler Bluff. The main occupation of the site begins during the Late Woodland period. While there is scant evidence for this occupation, the available data are consistent with what is know for Patrick phase settlements. The intensity of site occupation increases during the Emergent Mississippian period. Within the regional chronology, the evidence best fits with known Lindeman phase sites. The use of the site continues into the early Mississippian period, but intensity of site use appears to decline. Locally, the early portion of the Mississippian period is defined as Lindhorst (Kelly 1990a). Additional use of the site occurred at other times, but the aforementioned phases are central to an understanding of the site.

Site Function

As discussed in Chapter 3, the analysis of site function is divided into two related issues: potential activities conducted at 11MO891 and the internal patterning of those activities. To address this research goal, two types of data are analyzed. The type and quantity of artifacts, and subsistence remains are analyzed in an attempt to identify on-site activities. In addition, the spatial patterning and potential functions of the features themselves are analyzed. The results of these analyses are then compared to models of Emergent Mississippian and Mississippian period site types to address issues of potential differences in the use of floodplain and upland sites during those periods.

Material Remains

Three classes of material remains, broadly constituted, can be used to infer site function at 11MO891. These are subsistence remains, ceramics, and lithics. Data on subsistence remains, consisting of both faunal and paleobotanical remains, are summarized here and discussed in greater detail in another section of this chapter. Paleobotanical remains from Stemler Bluff are fairly similar to other Emergent Mississippian sites in the American Bottom region. Maize is common but in low amounts in feature fill. Nutshell is also common, probably a condition of site location, and is generally present in greater amounts at Stemler Bluff than at most other similarly dated sites in the region. Seed density is lower than many, but not all, American Bottom Emergent Mississippian sites. Seeds identified in the assemblage include little barley, maygrass, goosefoot, and polygonum, all components of a native horticultural complex. Squash and tobacco are also present. The faunal remains indicate a reliance on fish, similar to most other American Bottom sites, although the Stemler Bluff assemblage does have higher than average amounts of mammal remains. Coupled with high power magnification use-wear of retouched tools, the greater frequency of mammal remains may be indicative of greater emphasis on deer hunting and subsequent hide processing. The species identified in the faunal assemblage suggest the use of floodplain aquatic, floodplain prairie, and uplands environments. Both the faunal and paleobotanical assemblages are suggestive, although not conclusive, of a year-round site occupation.

The ceramic assemblage also is generally comparable with other Emergent Mississippian and early Mississippian period sites in terms of vessel forms present. Three forms, stumpware, funnels, and bottles are absent, although these are also absent at other sites such as Marge. Jars predominate over bowls, although both forms probably were used for various processing, storage, cooking, and serving tasks. No indication of on-site pottery manufacture was identified, although formal potteries are seldom located. The assemblage also has fewer decorated ceramics than many other similarly dated sites in the American Bottom. Madison County Shale and Monks Mound Red ceramics suggest interaction with more northerly populations, although the Ramey Incised examples at Stemler Bluff may be local imitations. Overall, the ceramic assemblage is more restricted in nature, in terms of vessel forms and frequency of decorated types, than many sites to the north.

The lithic assemblage is the largest material culture assemblage recovered at Stemler Bluff and consists of a variety of debris, tool, and raw material types. Perhaps the most striking aspect of the lithic assemblage is its overall similarity to that of the Middle Archaic Strong site (Volume 2 of this report) despite an almost 7,500-year interval between the two occupations. The Stemler Bluff assemblage contains both core-reduction and bipolar-reduction debris. This indicates that two tool manufacturing trajectories were employed, bifacial reduction and expedient tool manufacturing. Unfinished bifaces constitute 36 percent of the assemblage while expedient tools outnumber formal tools by a ratio of slightly over 2.5 to 1. The small sample of expedient tools analyzed using high power magnification usewear was used almost entirely for hide preparation.

The tool assemblage also is indicative of other site activities. Perforators, end scrapers, wedges, gouges, and burins all could have been used in hide preparation, woodworking, or, in some, instances drilling tasks. The presence of hoes and hoe flakes suggests gardening pursuits, albeit on a small scale. The projectile points associated with the Emergent Mississippian and Mississippian occupation of Stemler Bluff are dominated by arrow points and indicate that the occupants were engaged in hunting activities.

Feature Analysis

Potential feature functions at Stemler Bluff have been discussed in Chapter 4 and can be divided into two general types: domestic and mortuary. The domestic features appear to represent repeated occupations of one, or at most a few, farming households at Stemler Bluff. Numerous residential structures, both post-and-basin and wall-trench, were identified. Associated with these houses were a number of different morphological feature forms with potentially different functions. Basin-shaped pits of varying depths are common at the site, some of which represent hearths and earth ovens, others perhaps being storage pits prior to their infilling with debris. Bell-shaped pits are also present, many of which were associated with storage, perhaps of maize or nuts. Other bell-shaped pits functioned as earth ovens, and examples of their reuse as hearths also have been identified. Particular basin-shaped and bell-shaped pits contained unusually high numbers of cores and hammerstones and may be indicative of lithic manufacturing caches or their location near a lithic tool-making area. Similarly, some pits had unusually high numbers of plant processing tools and may represent close proximity to an activity area.

Spatial patterning, such as a community plan, within the domestic area of the site is largely lacking. Direct association of a particular house with a suite of features or activity areas could not be identified. At best, there appears to be some patterning in that structures are more typically located to the east of the sinkhole while pit features and presumed activity areas line the sinkhole edge. The poor resolution of spatial patterning at Stemler Bluff is due mainly to its occupational longevity. The construction of residential structures and features shifted through time and overlapped with previously occupied site areas. The few features exhibiting superpositioning suggests that site residents avoided reusing previous locations. Their ability to avoid specific locations could be due to either continuity of occupation or ability to recognize previous feature locations. In this sense, Stemler Bluff is a spatial and temporal palimpsest of Emergent Mississippian and Mississippian period domestic occupations.

The other cluster or type of features at Stemler Bluff is the 51 mortuary features located approximately 125 m to the west of the domestic features and northwest of the sinkhole. The mortuary features can be divided into two types: those with human remains and those without. Features with human remains are the less prevalent of the two and include features with whole body burials and those with a few scattered elements. While most have no inclusions, some features are lined with wood and others with limestone slabs. No grave goods are present, and both adults and subadults and males and females were buried in the mortuary area. The absence of skeletal remains in many of the features, the incomplete skeletons found in others, and the complete interments found in a few, suggest the mortuary was a processing area for the dead. Multiple-stage processing of the dead is not an uncommon practice among Mississippian populations (Milner 1984b). Finally, the lack of grave goods within the burials and a full spectrum of age and sex classes represented suggests that this was a nonelite cemetery.

Summary

The Stemler Bluff site fulfilled two different functions within the local Emergent Mississippian-Mississippian settlement system. The domestic area is a farmstead- to hamlet-sized residential area whose occupants were engaged in chert quarrying and biface reduction, hunting and gathering of local wild resources, limited gardening, and hide processing. Some of the end products of these activities, most importantly biface manufacture and hide processing, may have linked the Stemler Bluff occupants to other communities to the north in the American Bottom and other communities nearer to the site. In this sense Stemler Bluff is a classic example of a fourth-line community. But the presence of the mortuary area in close proximity to the habitation area suggests that the site is more than a farmstead or hamlet. Radiocarbon dates obtained for features from both indicate a temporal overlap in the use and occupation of the two site areas. This would suggest that Stemler Bluff was a nodal community during its period of occupation. The dead from within a restricted neighborhood would have been transported to the Stemler Bluff cemetery and there processed. Portions or all of the defleshed skeleton then could be removed from the cemetery and taken back to its place of origin. Such a scenario would explain the presence of mortuary features lacking interments and others with partial skeletons.

Sinkhole Usage

Phase II testing at 11MO891 identified a rich, midden-like deposit in the sinkhole at the southern edge of the site (McGowan 1994; Volume I, this report). Sinkholes represent potentially rich and unique data sets for the investigation of issues regarding the prehistoric occupation of a site as well as general questions about changing environmental conditions in the area (Butzer 1982). Major research questions addressed during Phase III work at 11MO891 concerned the origins and geomorphological history of the sinkhole and its potential utilization by prehistoric groups in the area. From an archaeological perspective, key issues to be addressed are whether the sinkhole was a water-filled basin during the Emergent Mississippian and Mississippian periods and how and when artifacts were deposited in the sinkhole. To investigate these questions, the sinkhole was trenched, test units were excavated, and the stratigraphic profiles were examined. It was anticipated that analysis of sediments and botanical and faunal remains would permit detailed description of the age, genesis, and history of this feature. Further, palynological data, if preserved, were to be used in analysis of pre-midden, midden, and post-midden deposits to determine if the nearby environment had changed through time. It was anticipated that this information would provide a better idea of human impact on the area.

Although data derived from analysis of the sinkhole indicate that it has been present since at least the Pleistocene, no evidence was secured to suggest that it was a water-filled depression during the occupation of Stemler Bluff. Erdmann and Bauer (1993) indicate that the sinkhole was free-draining throughout most of its existence, although ponding may have occurred during the early part of the Pleistocene epoch. Analysis of the excavation profiles indicated there is a thick deposit of postsettlement alluvium/colluvium (PSA) situated above an intact buried Holocene soil. The PSA deposits represent infill which has resulted from erosion and redeposition of the original soil cover as a result of historic agriculture. Prehistoric artifacts were found in Strata II and III, the humus-rich zones of PSA which represent an inverted, redeposited A horizon, and a rusted metal pocketknife was found in the lower of these two strata. The artifacts recovered from the sinkhole, therefore, have been secondarily redeposited and are not associated with an undisturbed prehistoric surface. Since the fill is the result of erosion from recent agricultural practices, no attempt was made to recover environmental data for analysis.

Emergent Mississippian and Mississippian Period Subsistence

The recovery of data with which to examine the nature of Emergent Mississippian-Mississippian period subsistence at the Stemler Bluff site was one of the primary research goals of the mitigation of this bluff crest site. Numerous advances in the study of American Bottom Emergent Mississippian and Mississippian period subsistence have been made over the last two decades, largely as result of the widespread excavations conducted by the FAI-270 project and the use of flotation sampling of excavated sediments from feature contexts that has vastly improved the rate of recovery of small-scale archaeobotanical and faunal remains. These advances in subsistence studies have resulted in both finer-grained explanations of synchronic variation among differing resource procurement strategies, and in a greater appreciation of diachronic trends in subsistence behaviors. Both synchronic and diachronic approaches to Emergent Mississippian and Mississippian period subsistence strategies have led to a fuller reconstruction of the nature of American Bottom societies and their adaptation to, and impact on, the physical environment.

Evidence of the subsistence pursuits of a site's inhabitants is often preserved in the form of charred botanical remains and faunal elements. In both cases, these remains represent by-products of subsistence activities and, in the case of charred botanical remains, also may represent accidents in the processing, preparation, or storage of plant resources. Thus, archaeologically recovered floral and faunal remains offer the archaeologist the most direct means of addressing subsistence behaviors at a given site or within a region. Since subsistence data also may be used in the reconstruction of past environments and habitat preferences. Such studies utilize measures of sample diversity, presence or absence of taxa with specific habitat requirements, and taxa with known seasonal availabilities. These provide a fuller picture of not only the type of resources that were being exploited by a prehistoric group, but also identify specific strategies that may have been employed to acquire the resources. Archaeological excavation of 219 subsurface features at the Stemler Bluff site and the analysis of a portion of the flotation samples resulted in the recovery of both preserved faunal and floral remains associated with the Emergent Mississippian and Mississippian period occupation of the site between roughly 800 to 1150 B.P.

Archaeobotanical Assemblage

One of the research goals of the Stemler Bluff site archaeological mitigation involves the description of plant subsistence strategies employed by the site residents during the Emergent Mississippian and Mississippian periods. With regard to the use of plant foods, several questions were investigated. First, does the Stemler Bluff archaeobotanical assemblage shed light on upland patterns of plant usage that differ from those seen at contemporaneous sites located on the floodplain? Potential differences in the type and quantity of distinctly upland or aquatic resources could address this issue. The nature of the archaeobotanical assemblage recovered at the site does differ from most floodplain sites in two respects, the low density of seeds per liter of analyzed flotation sample, and its high nutshell density. In terms of the seeds, several taxa of cultivated starchy seeds, including chenopodium, knotweed, maygrass, and little barley were recovered from feature contexts at the site. These plants are well-known examples of native plant taxa that were cultivated by aboriginal populations for a considerable period of time throughout the midcontinent. These plants continued to contribute to Mississippian subsistence despite the widespread introduction of maize cultivation during the Emergent Mississippian period. At Stemler Bluff these taxa, while present, have lower ubiquity ratings than those reported for many Emergent Mississippian and Mississippian sites located in the floodplain or in similar upland settings. Similarly, the overall seed density, 1.03 per 1 liter of processed fill, is at the low end of reported densities but is similar to small farmsteads such as Karol Rekas (11MS1255) and Esterlein (11MS598) (Dunavan 1990; Parker 1990). Thus, while these starchy-seeded plants contributed to the occupant's diet, their overall contribution may have been lower than at other contemporaneous sites.

With regard to the use of nuts, charred nutshell contributes 46.2 percent of the overall assemblage by count. This amount of nutshell is very uncharacteristic of previously studied Mississippian sites in the region (Johannessen 1984, 1988, 1993; Lopinot 1992). The resulting nutshell density, 290.2 fragments per 10 liters of fill, is far higher than any reported Emergent Mississippian or Mississippian site in the area (e.g., Esarey and Johannessen 1994; Holt 1996; Johannessen 1984; Johannessen 1987; Simon 1996). Even when the large quantity of nutshell (n=13,816) recovered from Feature 9/158 is excluded, the nutshell density for the remaining features is 28.0 fragments per 10 liters of fill, a figure that is still far higher than expected given the trend for decreased nut exploitation during the late prehistoric period in the American Bottom region (Johannessen 1984). This large amount of nutshell, 98.3 percent of which is thick-shelled hickory, is interpreted as due to seasonal exploitation of locally available nut masts that would have required little effort to collect and process given the site setting in an oak-hickory forest. Thus, while the overall trends noted for the American Bottom indicate a decrease in the role of wild gathered foods as maize and other cultivated plants grew in importance, site specific data diverge significantly from this pattern, especially when a particular wild resource, in this case hickory nuts, are readily available with little expenditure of effort. Such also may be the case during the Lohmann phase at the George Reeves site. Also located in the upland margin, nutshell is three times more abundant at this site. than in the preceding Lindeman phase (Johannessen 1987:354–355). Other wild plant resources, such as fruits and berries, however, are not well-represented in the Stemler Bluff assemblage, and their role in the diet likely was minimal.

Given the low density of seeds and the high density of nutshell within the Stemler Bluff archaeobotanical assemblage, it would appear that the relative contributions of each do not readily conform to an expected pattern based on previous analyses. This may be more true for nutshell, which is present in quantities well out of the expected range, than it is for the starchy-seeded plants which do fall within the low range of expected ubiquity ratings for the Emergent Mississippian and Mississippian periods. The high density of nutshell is likely the result of site setting and the ease with which fall nut masts could be gathered. The low frequency of seeds in the assemblage is less easily addressed, however, and could reflect either a lesser subsistence role for cultivated native plants at the site or simply represent an artifact of sampling or preservational biases.

A second research question posed for the archaeobotanical remains considered the nature of maize usage at the site. Maize was recovered from 57.9 percent of the sampled features. Cupule fragments account for 64 percent (n=404) of maize fragments while kernel fragments (n=226) comprise the remainder. The overall maize ubiquity of 57.9 is low as calculated for a sample of 26 floodplain and upland Mississippian sites in the American Bottom region (Lopinot 1992). This lower overall ubiquity may indicate that as a result of the site's upland location. The site's occupants did not have access to as much maize as floodplain populations. Existing models of Mississippian site location postulate that mixed-crop fields would have been located within a short distance of the isolated farmsteads and hamlets dispersed across the floodplain, and that larger, communal fields may have occupied lower areas of the floodplain (Emerson 1992; Woods 1987). In the uplands east of the American Bottom, survey data indicate that Mississippian sites are nearly always within 100 m of Wakeland silt loam (Woods and Holley 1991; Woods and Mitchell 1978), an alluvial soil found only in upland drainages and on the Mississippi River floodplain. The Stemler Bluff site is located on Alford silt loam, an acidic loessal soil, with the nearest area of Wakeland silt loam located at the bluff base. In the uplands, Wakeland soils are discontinuously distributed within drainages, with the exception of the Richland and Silver Creek drainages where they are more common (Higgins 1987). The site survey data indicate that the lower-order farmsteads and hamlets are closely associated with the Wakeland soil but that larger sites such as Dugan Airfield and Holliday, which are situated on drainage divides, deviate from that pattern. Such sites likely played important roles in regulating interregional exchange and their role in subsistence production was therefore probably of secondary importance (Woods and Holley 1991).

Given the location of the Stemler Bluff site at some distance, about 2 km, from Wakeland silt loam soils and the relatively low ubiquity of maize with respect to other Emergent Mississippian and Mississippian sites in the region, it is probable that the occupants were not engaged in large-scale agricultural activities in the immediate site area. The setting within the bluff-crest forest zone would have required extensive clearing of trees, a labor intensive operation. The cultivation of small gardens with a mix of native plants, maize, and squash, however, may have provided basic subsistence needs that could be supplemented with maize or other commodities that were obtained through exchange with floodplain sites.

The seasonality of occupation at the site is another research topic that can be addressed through archaeobotanical remains. At Stemler Bluff, the presence of spring-ripening starchy seeds, maygrass (*Phalaris caroliniana*), and little barley (*Hordeum pusillum*), and fall-ripening chenopod (*Chenopodium* spp.), and knotweed (*Polygonum erectum*), indicate that the occupation spanned at least the spring through early autumn months. Additional seasonal indicators include fall-ripening hickory nuts and the nutlets of the American lotus (*Nelumbo lutea*), which also produces seed pods in the autumn. Maize remains also are suggestive of an autumn occupation, although the consumption of immature, or green corn, during the summer months cannot be ruled out. A complicating factor in addressing the issue of seasonality of occupation is the storability of nuts, starchy seeds, and maize. Each of these subsistence items is readily storable for later consumption out of their season of availability. The presence of a number of bell-shaped pits at the site suggests that in-ground storage was taking place, and above-ground storage of subsistence items within structures cannot be ruled out. In fact, the large quantity of hickory nutshell recovered from a burned Mississippian structure (Feature 9/158) suggests that this was indeed the case. Thus given the presence of charred plant remains that indicate at least spring through autumn occupation and the capacity for storage of such subsistence items, a year-round occupation at Stemler Bluff cannot be ruled out.

A final research issue to be addressed through archaeobotanical remains touches on the potential for examining subsistence change through time. The occupational span of approximately 300 to 400 years of the Emergent Mississippian and Mississippian periods offers the potential for examining changes in plant exploitation that may be temporally significant. Several factors, however, lessen the potential for such insights. The first is that while both Emergent Mississippian and Mississippian components are present at the site, little significant change in plant usage is documented following the initial introduction of maize agriculture during the Emergent Mississippian period. It is true that the representation of maize does show a clear increase from the approximately 50 percent ubiquity observed in Emergent Mississippian site to upwards of 70 percent ubiquity by the Mississippian period. This general trend, however, is based on analysis of numerous components from a number of sites. The lower ubiquity of maize at Stemler Bluff does not necessarily point to a disconformity with the overall trends, but instead is likely attributable to sampling bias, preservational factors, the site setting in a forested upland environment, or a combination of these and other factors. The ability to address temporal trends is further hampered by the relatively small number of features that are securely dated to a single archaeological phase.

Overall, the archaeobotanical assemblage from Stemler Bluff is one that is not unexpected given the temporal parameters of site occupation, the nature and range of features sampled at the site, and its location on the landscape. The assemblage indicates that the site's occupants were engaged in a pattern of plant exploitation that typifies the Emergent Mississippian and Mississippian periods, namely that maize agriculture combined with the cultivation of a suite of native cultigens was undertaken along with the gathering of wild resources such as hickory nuts, fruits, and berries on a seasonal basis. In addition, the residents of the site used tobacco. The observed differences in this assemblage from previously studied assemblages in the region, namely the high density of hickory nuts and low seed density, are interpreted to be the result of site setting rather than as an indication that a divergent plant subsistence strategy was being pursued. The pattern represented at Stemler Bluff may become better understood in the future with the excavation of additional upland sites in the southern American Bottom region.

Faunal Assemblage

Aside from documenting the faunal remains at Stemler Bluff, it was anticipated that the faunal assemblage could be compared with other American Bottom sites to determine whether physiographic or temporal differences existed. Other issues that could be addressed with data from the faunal assemblage include information on site function and season of occupation. The faunal assemblage from the Stemler Bluff site is fairly robust when compared to other Emergent Mississippian and Mississippian period assemblages from the American Bottom. While a few sites, such as Cahokia, Sponemann, and the Emergent Mississippian component at Range, have larger assemblages, most are as large or smaller than the Stemler Bluff assemblage. Problems associated with interassemblage comparisons should, therefore, be minimal.

A comparison between the Stemler Bluff faunal assemblage and that of both floodplain and upland Emergent Mississippian and Mississippian period sites in the American Bottom was presented in

Chapter 9. The analysis compared class composition from 13 assemblages using multidimensional scaling in an attempt to discern either temporal differences or differences due to site location. The results suggested that few temporally or physiographically based differences are present among the assemblages. The Stemler Bluff assemblage does differ from the model discussed by Kelly and Cross (1984). In that model, fish are a baseline resource, comprising the single most common taxonomic class with few exceptions. Birds are next most common, and are dominated by waterfowl and terrestrial species remains. Mammals are relatively uncommon, although white-tailed deer are the single most important mammal species. The situation at Stemler Bluff is somewhat different. While fish are the most important class at Stemler Bluff, mammals, not birds, are next most common. White-tailed deer remains are most common of the mammal remains. Birds, while not as common as expected, are dominated by waterfowl and terrestrial species.

The results of the multidimensional scaling analysis indicate a more complex system of faunal procurement than that suggested by Kelly and Cross (1984). As discussed in Chapter 9, the data appear to indicate that two different strategies were employed, regardless of time period or physiographic placement of the site. The first is a generalized strategy wherein one aspect of site location was access to a wide range of fauna, although fish were always a key subsistence resource. This strategy is much like that described by Kelly and Cross (1984). The second is a focalized strategy, wherein one aspect of site location was access to a specific faunal resource. Particular sites, such as Marge and Robinson's Lake, have a large bird assemblages. Others, including AG Church and the Mississippian component at Sponemann, have large mammal assemblages. Interestingly, at George Reeves, mammals are a small component of the assemblage, but white-tailed deer constitute 86 percent of all mammal remains. Holt (1996) has suggested that the AG Church assemblage represents a focus on deer procurement. While mammal remains comprise a relatively large percentage of the Stemler Bluff assemblage, deer do not comprise a large portion of the mammal remains. But, the importance of deer was evidently twofold at Stemler Bluff; aside from meat procurement, the high-power magnification analysis of tools (discussed in Chapter 6), indicates that hide working was a common activity. Conjecturally, sites that focalized on specific classes or species might have supplied excess meat or hides through local exchange networks in the American Bottom region. Such networks could have distributed seasonally abundant resources, such as migrating waterfowl, or allowed populations to take advantage of slack agricultural periods, such as summer prior to harvest, or late fall and winter, to maximally exploit available faunal resources.

Finally, the faunal assemblage did not contain any strong indicators of seasonality. Almost all of the species identified could have been taken during a number of seasons. Typically, fish are thought of as a spring-summer resource, although they could have been taken through part if not all of a mild winter. Waterfowl congregate in the American Bottom during fall and early winter, and migrate through the area in spring. But, at present, a limited waterfowl population nests in the area, and could be taken almost year-round. Deer are most efficiently taken while congregating in late fall to winter, although they would have been present throughout the year. This absence of strong seasonality may indicate a year-round occupation at Stemler Bluff.

Summary

The Stemler Bluff faunal and archaeobotanical assemblages are similar to others documented to the north in the American Bottom with a few exceptions. The exceptions appear to be related to the immediate environment surrounding the site, an upland oak-hickory forest. This location may explain the high quantities of nutshell at the site and, perhaps, the lower densities of maize and seeds in the flotation samples. Poorer upland soils and the site location within an oak-hickory forest may have necessitated a shift toward wild plant collection due to a decrease in yields of cultivated plants or in arable land for cultivation. Similarly, the greater emphasis on mammals in the faunal assemblage may reflect ease of access to deer in the uplands.

With these few exceptions, Stemler Bluff has a rather typical late Emergent Mississippian and early Mississippian period subsistence base. In addition, the seasonality data from both assemblages lack conclusive proof of emphasis on a particular season or seasons and are interpreted to indicate a year-round occupation. Typical plants are present, including maize in over 50 percent of all samples, squash, various seeds, both wild and cultivated, and nuts. Faunal resources exploited are diverse and include an array of backwater fish species, mammals with an emphasis on deer, waterfowl and terrestrial birds, and miscellaneous reptile and amphibian species. This indicates that the Stemler Bluff inhabitants participated in a typical American Bottom subsistence strategy, either due to access to similar habitats, similar cultural approaches to subsistence, or both.

Settlement System

One of the research goals established for the archaeological mitigation of 11MO891 was to integrate it into a locale settlement system within which the site functioned as but a single component. Examination of the site and its position on the landscape, its internal composition and spatial organization, the nature and type of subsistence remains present, and the presence or absence of specialized categories of material remains or features all may be used to determine the role of Stemler Bluff within a larger system of interrelated sites. These indicators are compared with existing Emergent Mississippian and Mississippian settlement system models to provide a temporal and cultural context for the Stemler Bluff site data. Previous research into late prehistoric settlement dynamics in the major river valleys has suggested that a range of localized settlement systems occur that are in part dictated by environmental factors. Geographically and environmentally, the American Bottom provides the most relevant settlement data with which to evaluate the Stemler Bluff site. It should be noted, however, that as a result of the focus of previous excavations on the floodplain and the relative lack of large-scale archaeological investigations in the southern portion of the region, some interpretative limitations are expected.

Previous research has led to the development of a four-tiered settlement hierarchy in the American Bottom that is recognizable by the Emergent Mississippian period and that continues to characterize much of the subsequent Mississippian period. The various site types are defined on the basis of size, internal complexity, and the presence or absence of mounds (Fowler 1978). Using these measures, sites without mounds are classified as fourth-line communities; third-line communities are similar to fourth-line communities but also have a single mound; second-line communities are larger than 50 ha in size and contain multiple mounds; and finally, the only first-line community is Cahokia. Implicit in this four-tiered model is the existence of a hierarchical organization capable of integrating these sites into a functional whole generally acknowledged as being a chiefdom-level polity. The dispersed village settlement pattern formulated by Emerson (1992) represents a refinement of the previous model in that a set of functional relationships are ascribed to the numerous small hamlets and farmsteads at which the bulk of the American Bottom population was located. In addition to farmsteads and small hamlets, nodal hamlets contain communal facilities such as sweat lodges, communal storage, and specialized mortuary/temple complexes that served as a focal point for ritual activities. While expressly formulated for the floodplain, this model could easily accommodate the recognition of similar sets of relationships linking upland sites, not only to one another, but to floodplain communities as well. Survey data indicate that Mississippian sites located in the uplands east of the American Bottom appear to parallel the developments that occur in the floodplain and that the existence of apparent nodal sites such as Dugan Airfield and larger multimound sites such as Emerald indicate a similar integration of dispersed household and hamlet as that seen in the American Bottom floodplain (Koldehoff et al. 1993; Woods and Holley 1991; Woods and Mitchell 1978).

When viewed within the context of lower-order sites, Stemler Bluff appears to fit best a small hamlet composed of several households that was occupied over a period of about 300 years during the late Emergent Mississippian and Mississippian periods. The distribution of residential structures and associated storage and processing features along the eastern margin of an upland sinkhole suggests a series of occupational episodes within the forested upland margins. Stemler Bluff, however, does not show any of the regular distributions of structures and associated features around an open courtyard or plaza that are apparent at a number of floodplain sites of similar age. This lack of more formal site organization may reflect a low population at any given point of site occupation. The floral and faunal assemblages indicate that both upland and floodplain resources were exploited and that the residents had access to maize and other cultivated plant resources. Ceramics are overwhelmingly limestone tempered as is characteristic of southern American Bottom assemblages, and nonlocal types such as vessels made with Madison County Shale paste, the presence of which could be indicative of intra-regional trade with the northern American Bottom, are present in low frequency. Similarly, incised sherds, identified as Ramey Incised, are rare, and their eroded surfaces make it difficult to ascertain whether these sherds represent locally made copies. The lithic assemblage, with its abundant cores and debitage, indicates that the chert resources exposed along the bluff were being heavily exploited. Cores are present in much higher numbers at Stemler Bluff than at the more intensively occupied floodplain sites such as Range.

While there are no explicitly communal features identified within the residential portion of the site that indicate a nodal or integrative function, the existence of the spatially discrete but contemporaneous mortuary area located northwest of the sinkhole suggests that Stemler Bluff may have been more than a simple upland hamlet. The presence of a cemetery at Stemler Bluff, albeit one without associated charnel or ritual structures, may reflect a nodal aspect for this upland community. Previous research into Mississippian cemetery locations indicates regular patterns in both elite and nonelite mortuary behaviors, with nonelite peripheral cemeteries often located on isolated bluff top ridges above the floodplain. Such bluff crest cemeteries are described as being located at "some distance" from habitation areas. Nonelite cemeteries associated with regional centers are often spatially discrete and located in close proximity to mounds (Milner 1984b). The Stemler Bluff mortuary area would appear to fall somewhere between these examples given its close association with the residential area of the site and the lack of mounds or other ritual/ceremonial foci. The cemetery at Stemler Bluff did not produce any evidence for truss trenches that are proposed to have functioned as supports for mortuary platform and allowed the partial decomposition of remains. Such features are reported from the Greenhouse site, located near Columbia in Monroe County (Wolforth 1992), and the Holdener site in St. Clair County (Wittry et al. 1994). Neither Greenhouse nor Holdener, however, produced evidence for associated cemeteries, and the purported role of the truss trenches as mortuary-related is conjectural. The association of the mortuary and residential areas at Stemler Bluff also can be taken as an indication of the relative permanence of occupation at the site as it is unlikely that a seasonally occupied site would be associated with a mortuary area.

The presence of the cemetery at Stemler Bluff is not the only line of evidence that supports a nodal role for the site. The lithic assemblage, dominated by cores and debris from three locally available cherts, Salem, Burlington, and Fern Glen, indicates that due to the proximity of these lithic resources, chert procurement may have been an economic focus of the site's inhabitants and may have a great deal to do with the occupation Clearly from a plant-based subsistence standpoint, the site is poorly placed with regard to access to easily tilled soils given its location in a forested, loessal uplands, but it is ideally located to exploit the chert outcrops exposed in Dennis Hollow. While cleared gardens likely were present in close proximity to the residential area, the nearest productive soils conducive to aboriginal agricultural technology would have been located at the bluff base and floodplain. If residents were indeed engaged in deer hide preparation and chert procurement, a relationship in hides and which chert products were exchanged for maize or other subsistence products with floodplain communities or other upland communities can easily be postulated within the parameters of a dispersed neighborhood pattern and economy.

Based on the above noted characteristics, it is likely that the Stemler Bluff site functioned as an upland margin nodal hamlet during the Emergent Mississippian and Mississippian periods. The characteristics that define its nodal function, the presence of a contemporaneous but spatially discrete nonelite cemetery and the apparent effort expended in hide preparation and chert procurement, differ from those proposed by Emerson (1992) for floodplain sites. These differences, however, should not be taken as an indication that Stemler Bluff does not conform to a nodal hamlet definition, but that the concept of nodality, as it pertains to small sites in the American Bottom, should be expanded to include a wider range of characteristics and site types. As a nodal hamlet, Stemler Bluff was linked not only to sites on the floodplain but to other upland sites as well. The pattern of upland site interaction may have taken on a different character than that proposed for floodplain sites, with possible linear relationships between bluff crest sites as well as linkages with sites located farther to the east in the uplands being present. The paucity of excavated upland sites in the southern American Bottom region, however, makes further exploration of these relationships difficult. Survey data suggest that some upland sites may exhibit a high degree of residential permanence. It may be that the more permanently occupied upland sites are those that functioned in an integrative capacity as nodal points to facilitate economic, ritual/ceremonial, and socio-political relationships between dispersed upland habitations and between the uplands and the floodplain. Clearly, further research is needed to elucidate the nature of interaction between upland and floodplain sites more fully, as well as to begin to understand the range of variation that existed between smaller upland sites and those in the floodplain that fulfilled similar roles in a larger, regional settlement system during the Emergent Mississippian and Mississippian periods.

Conclusions: Stemler Bluff and the American Bottom Periphery

The Phase III mitigation of 11MO891 has, for the most part, achieved its goals. Of initial importance was the recovery of all archaeological material from intact deposits prior to the construction of infrastructure and buildings in the Valmeyer relocation parcel Addition 1 North. The use of heavy machinery to remove disturbed plow zone deposits allowed the definition of 219 prehistoric features during the Phase III investigations. The definition and mapping of these features allowed the collection of spatial data while their excavation resulted in the recovery of human remains, charcoal for radiocarbon dating, soil samples, and artifacts. These items then were processed and analyzed, the results of which led to the achievement of a second set of goals, placing the results into a local and regional context. The data recovered during the Phase III mitigation of the site allowed the investigation of four of the five broadly conceived areas of research proposed in the data recovery plan: chronology, site function, subsistence, and settlement system analysis. Only data pertaining to the use of the sinkhole proved disappointing, in that all artifacts located in this geologic feature were deposited by historically caused erosion.

Taken as a whole, the site plan, many of the artifacts, and features, are fairly typical of late Emergent Mississippian and Mississippian period sites in the American Bottom. Discussed below are a number of exceptions to this statement. Stemler Bluff has a higher representation of mammals and nuts than other American Bottom sites, and was apparently located in an attempt to use abundant nearby chert resources. Chert, most likely in the form of either blanks or finished tools, was exchanged with populations living in the chert-poor floodplain. The site plan or feature arrangement, or lack thereof, at Stemler Bluff is also different from many of the sites excavated to the north. This is probably indicative of smaller populations and a long occupational span at Stemler Bluff. Perhaps least typical is the presence of an associated cemetery. No other Emergent Mississippian cemetery has been excavated in the American Bottom to date, and the data recovered from Stemler Bluff provide a baseline for future research. In sum, while generally typical, the Stemler Bluff assemblages do differ in particulars, and baseline data on Emergent Mississippian cemeteries were obtained from the Phase III mitigation.

A more general question is why Stemler Bluff particulars diverge from American Bottom patterns across a number of data sets. To this, two explanations can be offered. First, Stemler Bluff is located in an unique uplands location. Many of the trends identified for the Emergent Mississippian and Mississippian periods are based on data from floodplain sites. Given their different environmental and physiographic setting, upland sites would be expected to differ, especially with regard to access to particular resources. Stemler Bluff had greater access to chert, nuts, and mammals than would be expected of floodplain sites. Aside from differences based solely on physiographic location, the peripheral location of Stemler Bluff, at the extreme southern end of the American Bottom, also would suggest differences from sites located to the north. To place the peripheral nature of the Stemler Bluff site into perspective, the nearest major multiple-mound center, Lunsford-Pulcher, is located 22 km north while Cahokia itself is 45 km to the northeast. Differences between Stemler Bluff and more northern sites would be expected if the former were peripheral to a Cahokia-dominated polity or cultural pattern. Kelly and Pauketat (1997) have identified the Richland complex, a similarly attenuated upland rural pattern to the east of Cahokia.

The true nature of Cahokia's influence or power is the center of debate (e.g., Mehrer 1995; Pauketat 1996). At one extreme, the so-called long arm of Cahokian elites is felt in rural households across the American Bottom while at the other, Cahokia's dominance extends little further than the site itself. While this debate rages for the American Bottom proper, what import has it for Stemler Bluff? Little evidence for Cahokia's control can be seen at Stemler Bluff. Interaction with northern populations has been documented by the presence of Madison County Shale and Monks Mound Red ceramics. Ramey Incised ceramics also occur, but may represent local imitations. All of the nonlocal material could represent trade relationships just as easily as the integration of Stemler Bluff into a Cahokia-based polity.

What then of the relationship of Stemler Bluff with the American Bottom Emergent Mississippian-Mississippian polity? A hierarchical view would have the site a fourth-line rural community integrated into the greater Cahokia polity through a local mound center such as Fenaia, located 2.5 km south of Stemler Bluff, or Washausen to the north. Conversely, such a rural location as Stemler Bluff would be a good candidate for Mehrer's (1995) theory of local autonomy within the larger-scale Cahokia-based hierarchy. Evidence for such a heterarchical system may be the paucity of signature artifacts such as Ramey Incised and Monks Mound Red. Alternatively, the site could represent a node in a regional core-periphery relationship between an

American Bottom polity and the surrounding uplands. Cahokia's influence was finite and no doubt decreased with distance. Products from the periphery, from sites such as Stemler Bluff, could have flowed into the American Bottom without a hierarchical political relationship or other form of hegemony.

While data from Stemler Bluff alone ultimately cannot address these issues in a definitive manner, they do highlight a seldom discussed topic; the relationship between the American Bottom proper and its adjacent hinterlands. Data from the American Bottom proper have yielded a great deal of thoughtful research concerning a number of topics, perhaps most importantly the nature of one particular Mississippian polity, Cahokia. Ultimately, additional excavations at sites peripheral to the American Bottom will be conducted as the region continues to develop. While comparisons to existing American Bottom models will, and should, continue to be made, greater emphasis needs to be placed on understanding the relationship between peripheral sites such as Stemler Bluff and those of the American Bottom. Of particular interest would be the systemic interrelationship between the core area and peripheral sites including the advantages of interaction to both areas and the means used by the core to direct, control, and manipulate that set of interactions. A complete understanding of the nature of the core American Bottom Mississippian polity will not be possible until a better understanding of its relationship to the periphery is gained.

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APPENDIX A.

FEATURE ATTRIBUTES

APPENDIX A.
FEATURE ATTRIBUTES

Shallow Basins

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio	*Vol. Form.	Volume (dm^3)	Density (g/dm^3)
3	0.85	0.80	0.09	1.06	6	35	46
4	0.87	0.78	0.09	1.12	6	43	171
6	1.48	1.30	0.24	1.14	6	404	3980
7	0.78	0.77	0.11	1.01	1	27	277
8	1.03	0.89	0.18	1.16	1	65	666
16	0.90	0.76	0.12	1.18	6	63	527
17	0.55	0.50	0.08	1.10	1	9	37
20	1.09	0.83	0.09	1.20	6	64	1514
22	1.08	0.40	0.10	2.70	3	41	588
27	0.91	0.78	0.16	1.17	2	34	328
31	0.87	0.86	0.16	1.01	1	39	813
34	1.20	0.90	0.18	1.33	6	204	458
36	1.46	1.32	0.27	1.11	7	274	2937
43	0.96	0.87	0.12	1.10	1	37	16
44	0.75	0.75	0.06	1.00	6	22	10
45	0.84	0.77	0.14	1.09	2	70	48
51	0.95	0.85	0.05	1.12			
55	1.10	0.94	0.28	1.17	4	192	428
56	0.67	0.59	0.08	1.13	1	13	18
59/60	1.03	0.67	0.10	1.54	6	67	138
62	1.05	1.05	0.24	1.00	4	149	295
63	0.79	0.76	0.09	1.04	1	22	43
65	1.00	1.00	0.16	1.00	6	84	236
78	1.08	1.03	0.03	1.05	6	25	0.02
81	1.10	0.93	0.21	1.18	6	167	908
100	1.08	0.96	0.05	1.13	2	39	0.2
102	1.25	1.19	0.16	1.05	1	31	163
103	1.00	1.00	0.18	1.00	6	114	56

APPENDIX A.
FEATURE ATTRIBUTES

Shallow Basins

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio	*Vol. Form.	Volume (dm^3)	Density (g/dm^3)
104	1.15	1.00	0.10	1.15	1	44	273
105	1.10	1.09	0.11	1.00	6	78	133
106	1.06	0.85	0.12	1.25	6	90	36
108	0.85	0.82	0.15	1.04	2	77	406
109	1.24	1.12	0.23	1.11	2	199	462
111	1.02	1.02	0.16	1	1	68	118
115	0.73	0.71	0.18	1.03	6	67	86
118	0.85	0.79	0.05	1.08	1	13	6
120	1.16	1.14	0.24	1.02	1	97	641
123	1.00	0.95	0.12	1.05	1	45	11
127	1.68	1.64	0.19	1.02	1	211	925
129	1.29	1.02	0.12	1.26	1	63	541
131	0.90	0.77	0.13	1.17	1	37	159
132	1.00	0.94	0.16	1.06	6	96	393
133	0.85	0.83	0.15	1.02	1	43	32
139	1.51	1.22	0.16	1.24	3	233	152
140	1.10	1.00	0.17	1.10	1	67	91
143	0.70	0.70	0.05	1.00	1	10	7
145	0.85	0.83	0.20	1.02			
146	0.70	0.55	0.05	1.27			
147	1.19	1.11	0.12	1.07	1	57	114
148	0.20	0.16	0.20	1.25	1	7	252
150	1.32	0.95	0.18	1.39	1	78	524
156	0.86	0.83	0.08	1.04	1	23	14
160	1.10	0.99	0.29	1.11	2	214	187
161	0.70	0.66	0.20	1.06	1	41	26
162	0.84	0.78	0.10	1.08	1	26	33
163	0.70	0.67	0.12	1.04	1	23	158

APPENDIX A.
FEATURE ATTRIBUTES

Shallow Basins

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio	*Vol. Form.	Volume (dm^3)	Density (g/dm^3)
164	1.08	0.55	0.18	1.96	2	57	273
166	0.98	0.92	0.14	1.07	5	76	73
167	1.05	0.98	0.11	1.07	1	45	47
168	0.66	0.59	0.18	1.12	2	46	33
169	0.74	0.70	0.13	1.06	6	49	18
171	0.96	0.85	0.12	1.02	1	33	112
172	0.99	0.92	0.22	1.08	1	81	93
173	0.73	0.70	0.15	1.04	1	32	47
180	0.89	0.87	0.15	1.02	2	91	549
181	0.55	0.51	0.13	1.07	6	26	263
207	0.77	0.75	0.10	1.03	1	23	5
208	0.92	0.84	0.15	1.1	6	74	22
209	1.00	0.98	0.21	1.02	1	86	48
225	1.05	0.98	0.11	1.07	1	45	70
226	1.10	1.05	0.15	1.05	1	70	603
230	1.85	1.23	0.23	1.50	3	341	377
231	1.12	1.04	0.16	1.08	1	75	20
232	1.45	1.00	0.11	1.45	3	131	260
234	0.72	0.64	0.13	1.13	1	17	36
254	0.51	0.47	0.05	1.21	1	5	139
257	0.77	0.73	0.21	1.05	6	75	49
259	1.05	·1.05	0.23	1.00	1	106	422
265	0.84	0.71	0.16	1.18	1	40	99
267	1.19	1.15	0.18	1.03	3	236	55
268	0.89	0.77	0.07	1.16	1	8	15
270	1.05	0.97	0.11	1.08	1	31	1022

APPENDIX A.
FEATURE ATTRIBUTES

Medium Basins

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio	*Vol. Form.	Volume (dm^3)	Density (g/dm^3)
5	2.72	1.80	0.30	1.51	6	1415	4591
33	1.02	0.90	0.30	1.10	4	250	500
41	0.59	0.49	0.38	1.20	1	68	19
47	1.12	1.09	0.37	1.05	4	287	1079
94	0.95	0.95	0.35	1.00	2	235	1588
124	1.23	0.85	0.37	1.45			
134	0.99	0.81	0.31	1.22	8	196	101
138	1.15	1.09	0.32	1.06	2	276	340
155	1.25	0.82	0.34	1.52	4	241	923
256	1.04	0.95	0.38	1.09	4	295	389

Deep Basins

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio	*Vol. Form.	Volume (dm^3)	Density (g/dm^3)
61	1.48	1.4	0.42	1.06	2	689	914
67	1.30	1.26	0.54	1.03	6	605	476
72	1.38	1.27	0.46	1.09	2	625	827
88	1.28	0.78	0.51	1.64			
113	2.26	1.40	0.60	1.61	1	865	1
137	1.28	1.14	0.42	1.12			
144	0.98	0.93	0.56	1.05	1	292	281
149	1.96	1.18	0.75	1.66	1	909	24
152	1.70	0.99	0.54	1.72	1	431	1
182	1.30	0.92	0.61	1.41	2	639	482
227	1.18	1.10	0.48	1.07			
258	0.82	0.77	0.40	1.06			

APPENDIX A.
FEATURE ATTRIBUTES

Bell-Shaped Pits

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio	*Vol. Form.	Volume (dm^3)	Density (g/dm^3)
1*2	1.23	0.99	0.40	1.24	7	326	245
21	1.06	0.95	0.65	1.12	7	518	2167
46	0.99	0.89	0.32	1.11	4	239	306
64	1.22	1.20	0.43	1.02	7	476	1294
77	1.32	1.26	0.44	1.05	7	550	1978
79	1.20	1.18	0.87	1.02	4	1271	7427
80	1.05	1.00	0.62	1.05	4	598	1200
82	1.14	0.99	0.63	1.15	2	502	4095
89	1.08	0.96	0.46	1.13	4	393	716
110	1.79	1.45	0.51	1.23	4	990	1166
122	1.00	0.96	0.60	1.04	4	508	217
125	1.18	0.86	0.55	1.38			
126	1.21	0.97	0.43	1.25	5	371	293
135	1.11	0.93	0.55	1.19	4	500	1248
142	1.10	1.07	0.49	1.03	4	510	3630
154	1.70	1.36	0.70	1.91	2	1270	2964
165	1.58	1.56	0.81	1.01	7	1468	2221
170	1.35	1.33	0.49	1.02			
179	1.07	0.95	0.56	1.13	4	551	866
210	1.01	0.98	0.80	1.03	8	593	631
223	1.35	1.15	0.50	1.17	4	685	739
224	1.32	1.18	0.67	1.12	4	987	599
228	1.12	1.07	0.51	1.02	2	480	1678
233	1.00	0.95	0.56	1.05	4	436	1526
235	0.96	0.95	0.42	1.01	4	223	125
236B	1.18	1.08	0.55	1.09	4	739	2537
255	1.2	1.12	0.4	1.07	4	478	909
264	1.12	1.11	0.3	1.01	5	337	676

APPENDIX A.
FEATURE ATTRIBUTES

Bell-Shaped Pits

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio	*Vol. Form.	Volume (dm^3)	Density (g/dm^3)
266	1.02	0.86	0.45	1.19	4	335	1230

Isolated Post Molds

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio
18	0.17	0.15	0.08	1.13
32	0.32	0.32	0.45	1.00
35	0.20	0.20	0.11	1.00
75	0.20	0.20	0.07	1.00
A	0.15	0.15		1.00
B	0.13	0.13	0.23	1.00

Mortuary Features

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio	Orientation
19	1.94	0.60	0.36	3.23	88
184			0.00		
185	1.00	0.39	0.29	2.56	178
186	0.70	0.40	0.11	1.75	23
188	1.30	0.60	0.28	2.17	179
189	0.67	0.37		1.81	174
190	0.95	0.62	0.34	1.53	60
191	1.08	0.64	0.77	1.69	4
192	1.25	0.51	0.14	2.45	35
193	0.97	0.54	0.15	1.80	19
195	1.37	0.68	0.10	2.01	62
196	1.12	0.54	0.32	2.07	51
197	0.80	0.44	0.19	1.82	48
198	1.30	0.53	0.38	2.45	169

APPENDIX A.
FEATURE ATTRIBUTES

Mortuary Features

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio	Orientation
199	1.39	0.69	0.34	2.01	48
200	1.34	0.72	0.28	1.86	16
201	0.70	0.37	0.08	1.89	51
202	1.02	0.69	0.20	1.48	41
203	1.33	0.55	0.21	2.42	18
204	1.88	0.71	0.40	2.65	61
205	0.65	0.58	0.19	1.12	21
211	0.69	0.29	0.17	2.38	58
212	0.77	0.33	0.15	2.33	83
213	1.06	0.48	0.16	2.21	44
214	1.69	0.73	0.28	2.32	55
215	1.52	0.68	0.25	2.24	49
216	1.26	0.45	0.43	2.80	27
217	0.92	0.80	0.44	1.15	35
218	0.64	0.25	0.15	2.56	0
219	0.78	0.39	0.15	2.00	172
220	0.92	0.44	0.36	2.09	122
237	1.32	0.40	0.10	3.30	16
238	1.11	0.41	0.35	2.71	23
239	1.91	0.82	0.19	2.33	44
240	1.12	0.76	0.31	1.47	0
241	2.07	0.77	0.41	2.69	59
242	1.23	0.59	0.49	2.08	0
243	1.84	0.45	0.38	4.09	9
244	1.78	0.68	0.19	2.62	89
245	0.80	0.30	0.18	2.67	58
246	0.84	0.42	0.11	2.00	160
247	0.95	0.40	0.11	2.38	14

APPENDIX A.
FEATURE ATTRIBUTES

Mortuary Features

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio	Orientation
248	0.85	0.44	0.10	1.93	18
249	0.94	0.65	0.10	1.45	90
250	0.50	0.34	0.08	1.47	161
251	0.97	0.43	0.15	2.26	47
252	1.05	0.45	0.13	2.33	18
253	0.67	0.34	0.18	1.97	174
261	0.70	0.33	0.33	2.12	90
262	1.13	0.34	0.28	3.32	24
263	1.54	0.90	0.24	1.71	173

Single-Post-and-Basin Structures

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio	Orientation	Floor Area (m^2)	Volume (dm^3)	Density (g/dm^3)	*Vol. Form.	# Posts
15	1.85	1.76	0.07	1.05	0		265	142	3	0
23	3.38	2.80	0.22	1.21	106	8.45	1155	10677	3	41
38	2.80	2.70	0.07	1.04		5.15	454	1745	3	14
40	2.94	2.16	0.06	1.36	124		381	1180	3	0
42	2.18	1.88	0.11	1.16	30	3.34	328	1152	3	27
48	2.96	2.92	0.18	1.01			519	2019	3	0
83	2.20	1.90	0.06	1.16	20		418	294	3	0
87	4.40	4.35	0.17	1.01			3254	368	3	0
90	2.52	2.36	0.16	1.07	163		952	5571	3	3
107	2.52	1.92	0.20	1.31	98	3.66	1064	2050	3	40
119	2.90	2.58	0.06	1.12						5
128	3.00	2.30	0.14	1.30	12	5.69	966	803	3	43
141	3.92	3.20	0.06	1.23			627	1364	3	11
10/157	2.18	2.08	0.10	1.05			168	573		0
159	4.09	2.73	0.12	1.50	15	7.81	893	1865	3	16
174	2.60	2.56	0.17	1.02			630	19	3	0

APPENDIX A.
FEATURE ATTRIBUTES

Single-Post-and-Basin Structures

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio	Orientation	Floor Area (m^2)	Volume (dm^3)	Density (g/dm^3)	*Vol. Form.	# Posts
177	2.50	2.00	0.06	1.23	90		250	765	3	7
178	2.73	2.23	0.14	1.22	16	4.23	426	1272	3	14
206	2.40	1.64	0.20	1.46			308	363	3	0
221	4.24	2.30	0.11	1.84	107		780	4617	3	4
222	3.36	2.59	0.19	1.30	109	6.85	1044	1068	3	35
269	2.88	2.61	0.15	1.10		6.60				10

Wall-Trench Structures

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio	Orientation	Floor Area (m^2)	Volume (dm^3)	Density (g/dm^3)	*Vol. Form.
96	2.49	2.28	0.28	1.09	83	4.04	908	3761	3
9/158	4.82	2.42	0.14	1.99	98	9.24	1633	747	3
236A	4.75	2.45	0.02	1.94	20	10.13	233		

Other

Feature No.	Length (m)	Width (m)	Depth (m)	L:W Ratio
130	2.16	1.46	0.05	1.48
151	2.01	1.18	1.73	1.70
229	4.80	1.50	0.56	3.20

*Volume Formulae

#1 V = Pi/6 x depth [3(length/2 x width/2) + depth^2] curvilinear orifice, incurved sidewalls

#2 V = Pi (length + width/4)^2 x depth curvilinear orifice, straight sides, flat bottom

#3 V = length x width x depth rectilinear orifice, straight sides, flat bottom

#4 V = Pi/3 x depth[(length + width/4)^2 + (base length + base width/4)^2 + ((length + width/4) (base length + base width/4))] curvilinear orifice, inslanting, outslanting or belled walls, flat bottom

#5 V = depth/6 [(2length x width) + (2base length x base width) + (length x base width) + (width x base length)

*Volume Formulae

		rectilinear orifice, inslanting, outslanting or belled walls, flat bottom
#6	$V = Pi \times depth/6\ (3/4 length^2 + 3/4\ width^2 + depth^2)$	curvilinear orifice, incurved walls, flat bottom
#7	V = formulae 2 + 4	curvilinear orifice, straight and belled walls, flat bottom
#8	V = formulae 2 + 6	curvilinear orifice, straight and incurved walls, flat bottom

Sources: #1-5 = Kelly et al (1987); #6 = Stahl (1985)

APPENDIX A.
FEATURE ATTRIBUTES
(Feature List)

Feature No.	Feature Class	Feature No.	Feature Class	Feature No.	Feature Class
1*2	bell-shaped	80	bell-shaped	147	shallow basin
3	shallow basin	81	shallow basin	148	shallow basin
4	shallow basin	82	bell-shaped	149	deep basin
5	medium basin	83	single-post-and-basin	150	shallow basin
6	shallow basin	87	single-post-and-basin	151	other
7	shallow basin	88	deep basin	152	deep basin
8	shallow basin	89	bell-shaped	154	bell-shaped
9/158	wall-trench structure	90	single-post-and-basin	155	medium basin
10/157	single-post-and-basin	94	medium basin	156	shallow basin
15	single-post-and-basin	96	wall-trench structure	159	single-post-and-basin
16	shallow basin	100	shallow basin	160	shallow basin
17	shallow basin	102	shallow basin	161	shallow basin
18	isolated post mold	103	shallow basin	162	shallow basin
19	mortuary	104	shallow basin	163	shallow basin
20	shallow basin	105	shallow basin	164	shallow basin
21	bell-shaped	106	shallow basin	165	bell-shaped
22	shallow basin	107	single-post-and-basin	166	shallow basin
23	single-post-and-basin	108	shallow basin	167	shallow basin
27	shallow basin	109	shallow basin	168	shallow basin
31	shallow basin	110	bell-shaped	169	shallow basin
32	isolated post mold	111	shallow basin	170	bell-shaped
33	medium basin	113	deep basin	171	shallow basin
34	shallow basin	115	shallow basin	172	shallow basin
35	isolated post mold	118	shallow basin	173	shallow basin
36	shallow basin	119	single-post-and-basin	174	single-post-and-basin
38	single-post-and-basin	120	shallow basin	177	single-post-and-basin
40	single-post-and-basin	122	bell-shaped	178	single-post-and-basin
41	medium basin	123	shallow basin	179	bell-shaped
42	single-post-and-basin	124	medium basin	180	shallow basin
43	shallow basin	125	bell-shaped	181	shallow basin
44	shallow basin	126	bell-shaped	182	deep basin
45	shallow basin	127	shallow basin	184	mortuary
46	bell-shaped	128	single-post-and-basin	185	mortuary
47	medium basin	129	shallow basin	186	mortuary
48	single-post-and-basin	130	other	188	mortuary
51	shallow basin	131	shallow basin	189	mortuary
55	shallow basin	132	shallow basin	190	mortuary
56	shallow basin	133	shallow basin	191	mortuary
59/60	shallow basin	134	medium basin	192	mortuary
61	deep basin	135	bell-shaped	193	mortuary
62	shallow basin	137	deep basin	195	mortuary
63	shallow basin	138	medium basin	196	mortuary
64	bell-shaped	139	shallow basin	197	mortuary
65	shallow basin	140	shallow basin	198	mortuary
67	deep basin	141	single-post-and-basin	199	mortuary
72	deep basin	142	bell-shaped	200	mortuary
75	isolated post mold	143	shallow basin	201	mortuary
77	bell-shaped	144	deep basin	202	mortuary
78	shallow basin	145	shallow basin	203	mortuary
79	bell-shaped	146	shallow basin	204	mortuary

APPENDIX A.
FEATURE ATTRIBUTES
(Feature List)

Feature No.	Feature Class
205	mortuary
206	single-post-and-basin
207	shallow basin
208	shallow basin
209	shallow basin
210	bell-shaped
211	mortuary
212	mortuary
213	mortuary
214	mortuary
215	mortuary
216	mortuary
217	mortuary
218	mortuary
219	mortuary
220	mortuary
221	single-post-and-basin
222	single-post-and-basin
223	bell-shaped
224	bell-shaped
225	shallow basin
226	shallow basin
227	deep basin
228	bell-shaped
229	other
230	shallow basin
231	shallow basin
232	shallow basin
233	bell-shaped
234	shallow basin
235	bell-shaped
236A	wall-trench structure
236B	bell-shaped
237	mortuary
238	mortuary
239	mortuary
240	mortuary
241	mortuary
242	mortuary
243	mortuary
244	mortuary
245	mortuary
246	mortuary
247	mortuary
248	mortuary
249	mortuary
250	mortuary
251	mortuary
252	mortuary
253	mortuary

Feature No.	Feature Class
254	shallow basin
255	bell-shaped
256	medium basin
257	shallow basin
258	deep basin
259	shallow basin
261	mortuary
262	mortuary
263	mortuary
264	bell-shaped
265	shallow basin
266	bell-shaped
267	shallow basin
268	shallow basin
269	single-post-and-basin
270	shallow basin
A	isolated post mold
B	isolated post mold

APPENDIX B.

CERAMIC ATTRIBUTES

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
1	N1/2		Indeterminate	limestone & grit	cordmarked	flattened	0.8			0.7	6.0	
1-2	S1/2	A	Type 4 Jar	limestone	cordmarked	flattened	7.8	10	10	6.6	16.3	
			Type 4 Jar	limestone	cordmarked	flattened	6.3			6.0	11.4	
1-2	S1/2	B	Type 3 Bowl	limestone & grit	cordmarked	flattened	7.5			7.3	17.2	
			Type 1 Bowl	limestone	smoothed cordmarked	flattened	6.1			7.6	10.0	
			Type 3 Bowl	limestone	cordmarked	flattened	5.3			7.6	5.9	
5	N1/2		Indeterminate	limestone	cordmarked	indeterminate					4.4	
			Type 2 Bowl	limestone	smoothed cordmarked	flattened	6.6			7.1	41.9	
			Indeterminate Jar	limestone	smoothed cordmarked	flattened	3.8			5.4	3.3	
			Type 5 Jar	limestone & grit	cordmarked	flattened	6.5	18	25	6.2	68.0	
			Indeterminate Jar	limestone & grit	smoothed cordmarked	flattened	6.5			9.3	11.9	
			Type 3 Jar	limestone & grit	smoothed cordmarked	flattened	7.1			6.1	23.5	
			Indeterminate Jar	limestone & grit	eroded	flattened	7.1			6.0	9.3	
			Indeterminate	limestone & grit	eroded	flattened	7.6				2.5	
			Indeterminate	limestone	plain	flattened	3.3			2.9	1.8	
			Indeterminate	limestone & grit	smoothed cordmarked	flattened	5.1			4.1	2.7	
			Indeterminate	limestone	cordmarked	flattened	6.6				2.1	
5	S1/2		Type 4 Jar	limestone	smoothed cordmarked	flattened	5.2	24	10	7.7	81.3	
			Type 4 Jar	limestone	smoothed cordmarked	flattened	5.5	20	25	6.4	178.6	
			Type 2 Bowl	limestone	cordmarked	flattened	5.9	34	15	9.0	232.9	
			Type 2 Bowl	limestone	cordmarked	flattened	7.5			9.0	158.0	
			Type 4 Jar	limestone	cordmarked	flattened	5.7			8.3	29.3	
			Indeterminate Jar	limestone	cordmarked	flattened	6.2			8.3	12.8	
			Type 3 Bowl	limestone	cordmarked	flattened	6.6	30	15	9.3	196.9	
			Type 3 Bowl	limestone	cordmarked	flattened	6.5			6.5	42.6	
			Type 1 Jar	limestone	cordmarked	flattened	6.8			5.3	9.7	
			Type 4 Jar	limestone	cordmarked	flattened	9.0			7.8	38.5	
			Type 3 Bowl	limestone	cordmarked	flattened	6.4			6.8	30.5	
6	W1/2		Type 4 Jar	limestone & grit	cordmarked	flattened	6.0	12	20	7.8	78.1	
			Type 4 Jar	limestone & grit	cordmarked	flattened	5.0	12	5	6.1	10.0	
			Type 2 Pinch Pot	limestone	smoothed cordmarked	rounded	3.0			6.6	13.9	
			Type 2 Indeterminate	grit	smoothed cordmarked	flattened	4.7			5.0	7.0	
			Indeterminate	limestone	plain	flattened	6.2				11.6	a
			Indeterminate Jar	limestone	plain	flattened	4.8			4.1	5.7	b
			Indeterminate	limestone	cordmarked	flattened	6.0			9.1	10.7	
			Type 2 Bowl	limestone	cordmarked	flattened	6.0			9.1	88.3	
			Type 3 Bowl	limestone	cordmarked	flattened	5.4			7.7	7.7	
			Type 4 Indeterminate	limestone	cordmarked	flattened	6.1			6.8	5.3	
			Indeterminate Jar	limestone	cordmarked	flattened	5.3			5.4	3.9	
6	E1/2		Type 5 Jar	limestone	cordmarked	flattened	4.6	12	25	5.8	72.8	
			Type 4 Jar	limestone	plain & cordmarked	flattened	4.6	16	10	5.6	95.8	
			Type 4 Jar	limestone & grit	cordmarked	flattened	6.3	22	15	7.0	208.8	
			Type 4 Jar	limestone & grit	smoothed cordmarked	flattened	6.3	18	35	6.8	117.8	
7	N1/2		Type 2 Bowl	limestone	cordmarked	flattened	6.1			7.3	12.8	

Comments

a - rim perforation

b - 2 lugs

Note: interior is plain unless noted otherwise

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
8	N1/2		Type 3 Indeterminate	grit	cordmarked	flattened	6.1			4.4	7.7	
			Type 4 Indeterminate	limestone & grit	plain	flattened	6.3			5.9	2.5	
			Indeterminate	limestone & grit	cordmarked	flattened	6.4			7.7	1.9	a
			Indeterminate Jar	limestone	cordmarked	flattened	5.2			5.4	12.9	b
8	S1/2		Type 5 Jar	limestone	plain	Indeterminate	4.0			4.8	11.2	c
158/9	NW1/4	I	Type 9 Jar	shell & grit	plain	flattened	4.5			7.7	60.1	d
158/9	SW1/4		Type 5 Jar	shell & grit	plain	flattened	4.4	24	15	8.6	36.7	
157/10	W1/2		Type 4 Indeterminate	limestone & grog	cordmarked	flattened	6.4			6.6	7.4	
			Type 3 Bowl	limestone & grog	cordmarked	rounded	8.8			13.0	33.2	
15	W1/2	A	Type 1 Jar/Bowl	limestone	cordmarked	flattened	5.1			3.8	4.1	
			Indeterminate	limestone	cordmarked	flattened	6.9			6.8	1.8	
16	W1/2		Indeterminate	limestone	plain	flattened	9.9			7.6	3.5	
			Indeterminate	limestone	cordmarked	flattened	6.6			6.7	2.0	
			Indeterminate	limestone & grit	cordmarked	flattened	7.9			6.3	1.9	
			Indeterminate	limestone & grit	cordmarked	flattened	7.1			6.9	2.2	
16	E1/2		Indeterminate	limestone	plain	flattened	6.5			7.5	6.5	
20	W1/2		Indeterminate	limestone	plain	flattened	6.1				8.7	
20	E1/2		Type 2 Bowl	limestone	smoothed cordmarked	flattened	5.0			5.8	39.1	
21	W1/2		Type 3 Jar	grit	cordmarked	flattened	4.4			7.7	6.3	
			Type 3 Bowl	limestone	cordmarked	flattened	6.6			7.8	12.5	
			Indeterminate Bowl	limestone	cordmarked	flattened	6.1			6.8	12.0	
			Type 1 Bowl	limestone	cordmarked	flattened	7.2			6.8	11.6	
21	E1/2	A	Type 3 Jar	limestone	plain	rounded	3.5	8	10	5.8	15.7	
			Type 3 Jar	limestone	cordmarked	flattened	4.7			7.0	48.6	
21	E1/2	D	Type 3 Bowl	limestone	cordmarked	flattened	9.4			12.0	144.8	
22	E1/2		Type 4 Jar	limestone	plain	flattened	6.4			5.5	9.9	
23	surface scatter		Type 3 Jar	limestone	plain	flattened	6.6				9.4	
			Indeterminate	limestone	plain	flattened	5.1				5.5	
			Indeterminate	limestone	eroded	flattened	5.7				6.9	
23	SW1/4		Type 4 Jar	limestone	plain & cordmarked	flattened	6.0	21	30	5.5	195.5	e
			Type 3 Jar	limestone	cordmarked	rounded	4.4			11.6	173.2	
			Type 3 Bowl	limestone	cordmarked	flattened	7.0			6.7	56.4	
			Type 4 Indeterminate	limestone	cordmarked	flattened	4.7			5.4	19.9	
			Type 3 Bowl	limestone	cordmarked	flattened	5.2			9.9	17.4	
			Indeterminate	limestone	cordmarked	flattened	5.3				10.7	
			Indeterminate	limestone	cordmarked	flattened	3.5				2.0	
			Type 3 Jar	limestone	plain	flattened	7.1	18	20	7.7	96.6	
			Type 3 Jar	limestone	plain	flattened	6.7			5.6	65.0	f
			Type 4 Jar	limestone	plain	flattened	6.0			5.9	12.9	
			Indeterminate	limestone	plain	flattened	6.6 to 10.7				8.6	g
			Type 4 Jar	limestone	plain	flattened	7.0			6.5	20.7	
				limestone	plain						10.1	
				limestone	plain						6.0	

Comments

a - rim has possible rounded or cordwrapped stick impressions on the superior lip surface
b - cordwrapped stick on rim
c - loop handle
d - Sand Prairie
e - diagonal cordwrapping
f - rim is eroded; measurement is not accurate
g - suspension hole

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
23	SW1/4			limestone	plain						2.6	
				limestone	plain						2.5	
				limestone	plain						2.6	
				limestone	plain						4.3	
				limestone	plain						2.6	
				limestone	plain						3.8	
				limestone	plain						1.1	
23	NW1/4		Type 3 Bowl	grog	cordmarked	flattened	7.0	32	5	8.7	57.4	
23	NW1/4		Indeterminate	limestone	cordmarked	flattened	5.3				2.2	
			Indeterminate	limestone	cordmarked	flattened	3.8				1.8	
			Type 3 Jar	limestone	plain	flattened	4.0	36	5	3.6	42.9	
			Indeterminate	limestone	plain	flattened	3.8				3.2	
				limestone	plain						5.4	
				limestone	plain						2.9	
				limestone	plain						2.3	
				limestone	plain						2.7	
				limestone	plain						1.1	
				limestone	plain						1.4	
23	E1/2		Type 3 Bowl	limestone	cordmarked	flattened	7.0			5.8	54.1	a
			Type 3 Bowl	limestone	cordmarked	flattened	5.2			7.1	20.6	
			Type 3 Bowl	limestone	cordmarked	flattened	7.9			8.4	50.4	b
			Type 3 Bowl	limestone	cordmarked	flattened	6.3			6.8	35.1	c
			Type 3 Bowl	limestone	cordmarked	flattened	6.5			5.3	11.6	
				limestone	cordmarked						10.0	
				limestone	cordmarked						9.9	
				limestone	cordmarked						6.9	
				limestone	cordmarked						6.8	
				limestone	cordmarked						2.4	
				limestone	cordmarked						2.1	
				limestone	cordmarked						1.5	
				limestone	cordmarked						1.4	
			Type 4 Jar	limestone	cordmarked & plain	flattened	8.2	38	10	6.9	213.3	
			Indeterminate	limestone	cordmarked	flattened	9.4			10.0	16.6	
			Indeterminate	no temper		rounded	5.6			8.3	10.2	d
				grog	cordmarked						5.9	
				grog	cordmarked						6.4	
				grog	cordmarked						2.6	
			Type 4 Jar	limestone	plain	flattened	6.3	28	20	6.0	71.6	e
			Type 5 Jar	limestone	plain	flattened	8.0			6.5	22.3	
			Type 3 Jar	limestone	plain	flattened	6.6			4.6	11.4	
			Type 3 Bowl	limestone	plain	flattened	3.8			5.0	6.7	
			Type 4 Jar	limestone	plain	flattened	5.2			3.2	4.1	
			Type 3 Jar	limestone	plain	flattened	7.8			4.8	12.3	
			Indeterminate	limestone	plain	flattened					2.2	

Comments

a - suspension hole
b - bi-convex drilling
c - eroded rim
d - pinch pot
e - lip decoration

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
23	E1/2		Type 3 Jar	limestone	plain	flattened	2.1	10	15	4.1	7.9	a
				limestone	plain						6.3	
				limestone	plain						5.7	
				limestone	plain						4.9	
				limestone	plain						5.3	
				limestone	plain						4.7	
				limestone	plain						4.2	
				limestone	plain						2.8	
				limestone	plain						2.2	
				limestone	plain						1.8	
				limestone	plain						1.2	
			Type 3 Bowl	limestone & grit	cordmarked	flattened	7.1			8.3	41.2	b
				limestone & grit	cordmarked							
31	N1/2	A	Type 4 Jar	limestone	cordmarked	flattened	4.5			4.5	5.6	
			Type 5 Jar	limestone	cordmarked & plain	rounded	3.4			5.9	17.7	
			Type 4 Jar	quartz	plain	flattened	4.3			4.0	4.1	c
33	E1/2		Type 4 Jar	limestone	cordmarked	flattened	3.8	6	10	3.9	2.6	
33	W1/2	B	Type 2 Bowl	limestone	plain	flattened	6.1			6.5	11.1	
34	N1/2	A	Type 5 Jar	grit	cordmarked	flattened	6.8			6.1	25.3	
34	S1/2	A	Type 4 Jar	limestone	plain	flattened	4.7			4.6	4.1	
36	S1/2	general fill	Type 2 Bowl	limestone	cordmarked	flattened	6.5	32	>15	7.6	48.5	
			Type 2 Bowl	limestone	cordmarked	flattened	6.6			6.4	33.5	
			Type 2 Bowl	limestone	cordmarked	flattened	5.5			7.4	16.6	
			Type 2 Bowl	limestone	cordmarked	flattened	5.8			7.7	22.2	
			Type 4 Jar	grit	cordmarked	flattened	2.9	6	10	2.8	2.8	
36	N1/2	general fill	Type 3 Jar	limestone	cordmarked	flattened	5.3			5.5	16.6	
			Indeterminate	limestone	cordmarked	flattened	8.0				5.7	
36	N1/2	conc. 2	Type 2 Bowl	limestone	cordmarked	flattened	6.9			7.8	51.9	
			Type 4 Indeterminate	limestone	cordmarked	flattened	5.5			5.8	9.9	
38	N1/2		Type 1 Bowl	limestone	cordmarked	flattened	5.2			11.0	59.8	
			Type 4 Indeterminate	limestone	cordmarked	flattened	5.0			8.0	6.0	
			Type 4 Indeterminate	limestone	cordmarked	flattened	5.0			7.7	10.1	
			Type 2 Bowl	limestone	cordmarked	flattened	4.8			7.2	21.8	
			Indeterminate	limestone	cordmarked	flattened	4.0			6.8	5.2	
			Indeterminate	limestone	cordmarked	flattened	5.5			6.5	2.6	
			Indeterminate	limestone	cordmarked	flattened	5.0				3.4	
			Indeterminate	limestone	cordmarked	flattened	6.0			6.6	1.8	
38	S1/2		Type 3 Indeterminate	limestone	plain	flattened	5.0			6.0	3.5	
			Indeterminate	limestone	plain	flattened	5.0			5.0	1.6	
			Indeterminate	grit	cordmarked	flattened	3.2			4.6	3.4	
			Type 3 Indeterminate	limestone & grit	smoothed cordmarked	flattened	4.5			5.0	2.9	
			Indeterminate	limestone	cordmarked	flattened	5.5			6.0	1.5	
			Indeterminate	limestone	cordmarked	flattened	5.0			6.8	1.3	
			Indeterminate	limestone	cordmarked	flattened	5.0			7.0	3.3	
			Type 3 Bowl	limestone	cordmarked	flattened	5.6	36	5	7.8	29.7	

Comments

a - suspension hole
b - stick decoration on superior surface
c - Madison County Shale

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
38	S1/2		Type 2 Bowl	limestone	cordmarked	flattened	5.3			9.6	29.3	
			Type 1 Bowl	limestone	cordmarked	flattened	6.3	46	5	10.6	109.6	
			Type 4 Indeterminate	limestone	cordmarked	flattened	5.3			8.5	7.9	
			Type 5 Indeterminate	limestone	cordmarked	flattened	7.0			6.7	7.9	
40	N1/2		Type 1 Jar	limestone	cordmarked	flattened	12.3			10.5	108.9	
42	N1/2		Type 5 Jar	limestone & grog	cordmarked	flattened	4.9			5.2	42.5	
				limestone	plain							
			Type 4 Jar	limestone	cordmarked	flattened	5.0			5.0	15.5	
			Type 2 Bowl	limestone	cordmarked	flattened	5.0			6.0	10.3	
			Type 3 Bowl	limestone	cordmarked	flattened	6.0			10.5	6.8	
42	S1/2		Type 1 Bowl	limestone	cordmarked	flattened	3.1			6.3	19.4	
			Type 3 Bowl	limestone	cordmarked	flattened	4.0			5.0	4.4	
			Indeterminate	limestone & grog	smoothed cordmarked	flattened	6.0			7.3	6.5	
46	E1/2		Type 3 Jar	limestone & grit	cordmarked	flattened	4.2	18	10	6.1	92.1	
47	W1/2	A	Type 3 Jar	limestone	plain	flattened	4.7			5.8	5.6	
			Type 2 Bowl	limestone	cordmarked	flattened	3.8			5.1	4.0	
48	NW1/2		Type 4 Jar	limestone	plain	flattened	4.7	30	7	7.2	44.3	a
48	NW1/2		Type 3 Jar	limestone	plain	rounded	4.4	6	13	5.6	7.2	b
			Type 5 Indeterminate	limestone	cordmarked	flattened	5.1			7.7	10.7	
48	E1/2		Type 5 Jar	limestone	plain	flattened	5.4			8.3	92.2	
			Angled Rim Jar	limestone	plain	flattened	15.2/10.1	16	13	6.6	25.1	
			Type 4 Jar	limestone	plain	flattened	6.7			8.5	16.9	
			Type 3 Jar	limestone	plain	flattened	4.7			5.6	12.9	
			Type 3 Jar	limestone	plain	flattened	4.6	12	10	6.1	18.7	
			Indeterminate Jar	limestone	plain	flattened	5.0			8.0	12.4	
			Type 3 Jar	limestone	plain	flattened	5.6			6.2	9.4	
			Indeterminate Jar or Bowl	limestone	cordmarked	flattened	7.2			6.2	28.7	
55	E1/2		Type 2 Bowl	limestone	cordmarked	flattened	6.4			6.2	19.1	
			Type 1 Jar	grog	plain	flattened	3.3			3.9	15.8	
61	N1/2		Type 3 Jar	limestone	plain	flattened	5.0			5.1	3.4	
62	E1/2		Type 4 Jar	limestone	red slipped/red slipped	flattened	6.1			7.4	2.8	
64	W1/2	A1	Indeterminate	limestone	cordmarked	flattened	7.4				5.0	
64	W1/2	A2	Indeterminate	limestone	plain	flattened	5.4				2.3	
			Indeterminate	limestone	plain	flattened	4.1				1.6	
			Indeterminate	limestone	plain	flattened	6.7				1.4	
			Indeterminate	limestone	cordmarked	flattened	6.2				4.1	
64	E1/2	A	Indeterminate	grit	plain	flattened	5.0				2.0	c
			Indeterminate	limestone	plain	flattened	4.0				2.1	
65	E1/2		Type 4 Jar	limestone	plain	flattened	5.8			7.0	4.0	
65	W1/2	B	Type 3 Jar	limestone	cordmarked	flattened	5.4			5.0	5.2	
72	W1/2	A	Type 5 Jar	limestone	plain & cordmarked	flattened	4.1	12	20	3.8	42.3	d
72	E1/2	A	Indeterminate	limestone	cordmarked	flattened	5.4				4.6	
			Indeterminate	limestone	cordmarked	flattened	8.3				3.2	
72	E1/2	B	Indeterminate	limestone	plain	flattened	3.9				1.6	
			Indeterminate	limestone	plain	flattened	4.7				4.0	

Comments

a - sandy paste
b - sandy paste
c - pinched rim with slashes
d - possible lug

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
72	E1/2	C	Indeterminate	limestone	plain	flattened	4.0				2.7	
			Type 5 Jar	limestone	plain & cordmarked	flattened	4.3			3.5	19.3	
			Indeterminate Pinch Pot	grog		rounded	4.0				5.2	
77	S1/2	A	Indeterminate	limestone	plain	flattened	4.6				12.2	
			Indeterminate	limestone	plain	flattened	4.2				10.7	
			Indeterminate	limestone	plain	flattened	4.5				3.7	
			Indeterminate	limestone	plain	flattened	8.0				6.3	
			Type 2 Bowl	limestone	cordmarked	flattened	7.0				17.9	
77	N1/2	A1	Type 4 Jar	limestone	plain	flattened	5.0	14	10		35.7	
			Type 3 Indeterminate	limestone	red slipped/red slipped	flattened	3.6				6.2	
			Type 3 Jar	limestone	plain	flattened	2.4					
			Type 5 Jar	limestone	plain	flattened	2.1					
			Type 3 Jar	limestone	plain	flattened	2.2	8	20			
79	N1/2		Type 3 Jar	limestone	cordmarked	flattened	7.7			5.3	21.6	
			Type 3 Jar	limestone	cordmarked	flattened	5.2			6.5	7.2	
79	N1/2	B	Type 2 Bowl	limestone	plain	flattened	4.7	16	25	5.6	50.3	a
			Type 1 Jar	limestone	plain	rounded	5.1	15	45	10.2	1102.0	b
			Type 3 Jar	limestone	plain	flattened	5.9			6.0	32.4	c
			Type 4 Jar	limestone	plain	flattened	4.1			4.2	10.4	
			Type 4 Jar	limestone	plain	flattened	8.0			5.1	7.1	
			Type 3 Jar	limestone	cordmarked	flattened	5.8	12	15	3.5	261.7	
79	N1/2	B	Type 2 Bowl	limestone	cordmarked	flattened	6.0			9.9	117.5	
			Type 3 Jar	limestone	plain & cordmarked	flattened	4.6	22	20	5.3	145.4	
			Type 4 Jar	limestone	plain & cordmarked	flattened	5.9	20	20	4.4	57.6	d
			Type 3 Jar	limestone	plain & cordmarked	rounded	5.0			5.8	40.5	d
			Indeterminate Pinch Pot	shell	plain	rounded	5.1	4	35	15.0	18.4	
80	S1/2		Indeterminate	limestone	smoothed cordmarked	flattened	7.0				3.7	
			Indeterminate	limestone	plain	flattened	7.5				2.6	
			Indeterminate	limestone	red slipped/red slipped	flattened	5.0				3.3	
			Indeterminate	limestone	red slipped/red slipped	flattened	8.0				2.7	
81	W1/2		Type 2 Bowl	limestone & grit	cordmarked	flattened	5.2			6.9	23.4	
				limestone & grit	cordmarked						6.1	
				limestone & grit	cordmarked						2.1	
			Type 2 Bowl	limestone	cordmarked	flattened	6.6			7.9	46.5	
81	E1/2	A	Type 2 Bowl	limestone	cordmarked	flattened	6.2			6.9	39.7	
			Type 4 Jar	limestone	plain	flattened	3.3	17	10	4.8	40.6	e
				limestone & grit	cordmarked							
82	S1/2		Type 3 Bowl	limestone	cordmarked	flattened	4.9			8.0	26.4	
			Type 3 Bowl	limestone	cordmarked	flattened	6.6			5.0	15.7	f
			Type 3 Jar	limestone	cordmarked	flattened	6.0			7.2	14.1	
			Indeterminate	limestone	cordmarked	flattened	4.0				6.5	
			Indeterminate	limestone	cordmarked	flattened	4.9				6.0	
			Indeterminate	limestone	cordmarked	flattened	4.0				2.4	
			Type 5 Jar	limestone	plain	flattened	3.0			9.0	36.3	

Comments

a - carbonized exterior
b - paired suspension holes apparently on 2 sides of vessel. Seed jar
c - some carbonized exterior
d - carbonized exterior
e - vertical stick impression is very faint
f - decoration on superior lip surface

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
82	S1/2		Type 4 Jar	grit	plain	flattened	3.5			6.8	46.5	a
			Indeterminate	grit	plain	flattened	4.6				4.3	
82	N1/2	A	Type 3 Bowl	limestone	cordmarked	flattened	6.7			8.7	74.3	
			Type 3 Jar	limestone	cordmarked	flattened	5.4	18	10	7.0	38.8	
			Type 1 Bowl	limestone	cordmarked	flattened	6.9			7.1	50.6	
			Type 3 Bowl	limestone	cordmarked	flattened	5.6			8.0	21.6	
			Indeterminate	limestone	cordmarked	flattened	5.6			8.7	15.2	
			Indeterminate	limestone	cordmarked	flattened	6.0			6.3	15.2	
			Indeterminate	limestone	cordmarked	flattened	5.0			6.4	10.7	
			Indeterminate	limestone	cordmarked	flattened	3.9			6.0	6.7	
			Indeterminate	limestone	cordmarked	flattened	5.0			7.6	7.0	
			Type 5 Jar	limestone	plain	flattened	4.0			6.0	24.0	
			Type 1 Jar	limestone	plain	flattened	5.0			4.7	14.0	a
			Indeterminate	limestone	eroded						10.3	
82	N1/2	C	Indeterminate	limestone	plain	flattened	6.9				12.6	
			Indeterminate	limestone	cordmarked	flattened	4.7				4.4	
			Indeterminate	limestone	cordmarked	flattened	2.7				1.5	
			Indeterminate	limestone	cordmarked	flattened	4.8				1.4	
88	SE1/2	A	Type 3 Bowl	limestone	cordmarked	rounded	4.8			8.3	50.8	
				limestone	plain							
				limestone	plain							
				limestone	smoothed cordmarked							
88	SE1/2	B	Type 1 Jar	limestone & grit	cordmarked	rounded	4.3			9.2	28.2	
				limestone & grit	cordmarked						3.0	
89	N1/2	B1	Type 3 Bowl	limestone & grit	cordmarked	flattened	5.4			9.2	49.9	
			Indeterminate	limestone	plain	flattened	2.6				3.1	
89	S1/2			limestone	eroded							
89	S1/2		Type 4 Jar	limestone	plain	flattened	3.2				4.4	b
			Type 3 Jar	limestone	plain	flattened	3.1				9.8	
90	E1/2		Type 3 Jar	grit	plain & cordmarked	flattened	7.0			3.8	86.0	c
			Type 3 Jar	grit	plain	flattened	7				67.6	c
			Indeterminate	grit	plain	flattened	3.3				6.5	c
			Type 3 Jar	limestone	cordmarked	flattened	5.1	22	15	4.8	113.0	
			Indeterminate	limestone	cordmarked	flattened					1.9	
			Indeterminate	limestone	cordmarked	flattened	4.2				3.7	
			Indeterminate	limestone	cordmarked	flattened	4.5				8.8	
			Indeterminate	limestone	cordmarked	flattened	5.6				1.9	
			Indeterminate	limestone	cordmarked	flattened	4.1				1.4	
			Type 3 Jar	limestone	smoothed cordmarked	rounded	2.8	8	15	6.0	12.4	
			Type 3 Jar	limestone	plain & cordmarked			14	50	4.0	190.4	d
90	SW1/4		Type 5 Jar	limestone	cordmarked	flattened	5.0	24	35	3.5	183.8	
			Type 5 Jar	limestone	cordmarked	flattened	4.7				26.2	
			Indeterminate	limestone	cordmarked	flattened	6.6				8.4	
			Type 4 Jar	limestone	plain	flattened	4.4				13.0	
			Type 4 Jar	limestone	plain	flattened	4.0				15.8	

<u>Comments</u>

a - Madison County Shale
b - suspension holes
c - Madison County Shale
d - rim was eroded away

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
90	SW1/4		Indeterminate	limestone	plain	flattened					3.6	
			Indeterminate	limestone	plain	flattened					2.9	
			Indeterminate	limestone	plain	flattened					4.0	
			Indeterminate	limestone	plain	flattened					2.7	
			Indeterminate	limestone	plain	flattened					2.5	
94	E1/2		Type 3 Jar	limestone	cordmarked	flattened					14.2	
				limestone	cordmarked	flattened					4.6	
94	W1/2	A	Type 4 Jar	limestone	cordmarked	flattened	4.3				12.4	
				limestone	cordmarked						1.2	
				limestone	cordmarked						0.8	
				limestone	smoothed cordmarked						2.0	
94	W1/2	B	Type 4 Jar	limestone	cordmarked	flattened	5.2	25	20	6.1	191.1	
				limestone	cordmarked						2.6	
				limestone	cordmarked						1.4	
96	N1/2		Indeterminate	limestone	smoothed cordmarked	flattened	4.2				5.3	
			Indeterminate	limestone	smoothed cordmarked	flattened	4.2				3.4	
			Type 3 Bowl	limestone	cordmarked	flattened	6.0	34	35	6.3	371.8	
			Type 3 Bowl	limestone	cordmarked	flattened	6.0				170.9	
			Indeterminate	limestone	cordmarked	flattened	6.2				8.3	
			Indeterminate	limestone	cordmarked	flattened	5.4				4.3	
			Indeterminate	limestone	cordmarked	flattened	5.2				2.9	
			Indeterminate	limestone	cordmarked	flattened	5.8				2.8	
96	S1/2		Indeterminate	limestone	plain	flattened	4.5				7.8	
			Indeterminate	limestone	plain	flattened	3.5				7.7	
			Indeterminate	limestone	plain	flattened	4.0				4.5	
			Indeterminate	limestone	cordmarked	flattened	6.0				2.0	
			Indeterminate	limestone	cordmarked	flattened	4.5				4.7	
			Indeterminate	limestone	cordmarked	flattened	5.1				16.2	
			Indeterminate	limestone	cordmarked	flattened	5.8				4.8	
			Indeterminate	limestone	cordmarked	flattened	5.5				7.5	
			Type 1 Bowl	limestone	cordmarked	flattened	5.6			8.5	93.3	
			Type 3 Bowl	limestone	cordmarked	flattened	5.5			6.7	190.8	
99	S1/2		Type 2 Bowl	limestone	cordmarked	flattened	7.3			6.3	36.1	a
			Indeterminate	limestone	cordmarked	flattened	4.0				3.2	
			Indeterminate	limestone	cordmarked	flattened	7.5				9.9	
			Indeterminate	limestone	cordmarked	flattened	4.5				5.4	
			Indeterminate	limestone	cordmarked	flattened	7.5				5.0	
			Indeterminate	limestone	cordmarked	flattened	6.8				3.5	
			Indeterminate	limestone	cordmarked	flattened	6.1				3.0	
			Indeterminate	limestone	cordmarked	flattened	4.0				1.6	
			Type 2 Bowl	limestone	eroded	rounded	3.1				30.1	
104	E1/2		Type 3 Jar	limestone	cordmarked	flattened	4.9				10.1	
			Type 4 Jar	limestone	plain	flattened	4.2				7.8	

Comments

a - decoration on superior lip surface

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
104	W1/2		Type 4 Jar	limestone	plain	flattened	4.4				15.5	
105	PP 1		Indeterminate	limestone	cordmarked	flattened	7.2				10.7	
107	W1/2		Type 3 Jar	limestone	plain	flattened	8.1				7.0	
			Type 4 Jar	limestone	cordmarked	flattened	5.0			8.2	68.6	
			Type 1 Jar	limestone	cordmarked	flattened	5.8			6.4	20.0	
			Type 3 Jar	grit	plain & cordmarked	flattened	4.5	12	10	4.1	17.9	a
107	E1/2		Type 4 Jar	limestone	plain	flattened	7.5	16	10		15.4	b
			Type 3 Bowl	limestone	cordmarked	flattened	5.9	40	10	7.9	118.1	
			Type 2 Bowl	limestone	cordmarked	flattened	5.5			8.5	28.7	
			Type 2 Bowl	limestone	cordmarked	flattened	7.1			8.2	41.7	c
			Type 3 Jar	limestone	plain & cordmarked	flattened	4.8	20	5	4.6	67.3	d
110	W1/2		Type 4 Indeterminate	limestone	plain	extruded	9.8				5.1	
			Type 4 Jar	limestone	plain	flattened	4.2			4.6	9.5	
			Indeterminate	limestone	cordmarked	flattened	7.0				2.6	
				limestone	plain						3.6	
				limestone	cordmarked						6.1	
				limestone	cordmarked						4.4	
				limestone	cordmarked						1.5	
				grog	cordmarked							
119	E1/2		Type 3 Jar	limestone	plain	flattened	5.8				7.0	e
			Type 3 Indeterminate	limestone	plain	flattened	4.7				6.6	
			Indeterminate	limestone	plain	flattened	4.0				3.4	
			Type 7 Pinch Pot	grog	plain	rounded	6.1				7.5	
119	W1/2		Indeterminate	grit	plain	flattened	4.0				3.3	f
			Indeterminate	limestone	eroded	flattened	7.0				3.0	
			Type 3 Jar	limestone	eroded	flattened	4.0	14	10	4.6	12.7	g
			Type 3 Indeterminate	limestone	plain	extruded	11.5				4.1	
			Type 3 Jar	limestone	plain	flattened	4.0	12	10		33.6	
			Type 3 Jar	limestone	plain	flattened	5.9	12	10		14.6	e,g
			Type 3 Jar	limestone	plain	flattened	5.4				10.8	e
			Type 5 Jar	limestone	cordmarked	flattened	4.7	18	10	5.6	28.0	
				limestone	cordmarked						6.2	
				limestone	cordmarked						4.0	
125	N1/2		Type 3 Jar	limestone	plain	flattened	7.1	18	10	6.5	83.5	
			Type 2 Bowl	limestone	smoothed cordmarked	flattened	5.3			3.3	14.2	g
				limestone	eroded							
				limestone	red slipped/red slipped						1.3	
125	S1/2		Type 5 Jar	limestone	smoothed cordmarked	flattened	2.9	9	10		13.8	
				limestone	smoothed cordmarked							
			Indeterminate	limestone	smoothed cordmarked	flattened					4.2	h
				limestone	cordmarked							
126	E1/2	A	Type 3 Jar	limestone	plain	flattened	4.6				28.8	
			Indeterminate	limestone	cordmarked	flattened					2.0	

<u>Comments</u>

a - carbonized exterior
b - discontinuous notched rim
c - incomplete suspension holes
d - oblique slashed superior lip surface
e - conjoined
f - suspension hole
g - possible exterior red slip
h - interior lug

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
126	W1/2		Type 3 Bowl	limestone	cordmarked	flattened	5.0			7.8	24.8	
126	E1/2	B	Indeterminate	grog	plain	flattened	5.5				3.2	a
127	N1/2		Type 4 Indeterminate	limestone	cordmarked	flattened	7.5			7.9	24.0	
				limestone	cordmarked						1.2	
				limestone	cordmarked						7.8	
				limestone	smoothed cordmarked						2.1	
128	E1/2		Indeterminate	limestone	cordmarked	flattened	6.3				5.1	
			Indeterminate	limestone	cordmarked	flattened					5.7	
128	W1/2	A	Indeterminate	limestone	cordmarked	flattened	9.6				14.5	b
129	S1/2		Indeterminate Jar	limestone	smoothed cordmarked	flattened	6.1				36.4	
			Type 4 Jar	limestone & grit	plain	flattened	4.2			8.1	33.0	
131	S1/2		Type 4 Jar	limestone	plain	flattened	5.8				7.8	
132	E1/2	A	Type 1 Bowl	limestone	cordmarked	flattened	7.9				36.4	
134	S1/2		Type 3 Bowl	grog	cordmarked	flattened	4.7			8.2	15.8	
135	N1/2		Type 3 Jar	limestone	plain	flattened	3.4			4.1	7.5	
135	S1/2		Type 3 Jar	grit	plain	flattened	8.0	34	10		96.3	c
137	E1/2		Type 4 Jar	limestone	cordmarked	flattened	3.5				12.7	
			Indeterminate	limestone	cordmarked	flattened	5.2				8.2	d
			Type 4 Jar	limestone	plain	flattened	4.1				5.2	
137b	W1/2	1-2	Indeterminate	limestone	plain	flattened	3.4				2.1	
137b	W1/2	3-4-5	Indeterminate	limestone	plain	flattened	6.4				9.3	e,f
			Type 4 Jar	limestone	plain	flattened	5.0				6.5	f
138	E1/2	B	Indeterminate Pinch Pot	grog	plain	rounded	2.5			8.0	7.9	
138	W1/2		Indeterminate	limestone	smoothed cordmarked	flattened	5.5				5.7	
141	E1/2		Indeterminate	limestone	cordmarked	flattened	7.9				7.0	
			Indeterminate	limestone	cordmarked	flattened	0.0				5.2	
			Indeterminate	limestone	cordmarked	flattened	8.0				3.3	
			Indeterminate	limestone	plain	flattened	4.5				1.9	
141	W1/2		Indeterminate	limestone	plain	flattened	2.5				1.0	
			Type 3 Jar	limestone	plain	flattened	2.8			8.4	16.9	
142	W1/2		Type 3 Jar	limestone	plain/red slipped	flattened	6.0	12	15	6.9	188.5	g
			Type 3 Bowl	limestone	cordmarked	flattened	3.9	40		7.7	40.5	
			Type 4 Jar	limestone	plain	flattened	7.5			6.6	15.8	
				limestone	plain						1.1	
				limestone	plain						1.4	
				limestone	plain						3.6	
				limestone	plain						2.1	
				grog	cordmarked						1.0	
			Type 4 Pinch Pot			rounded	4.0	2	100	11.0	34.5	
142	E1/2	B	Type 3 Bowl	limestone	plain/red slipped	flattened	4.3	22	20		37.6	
				limestone	plain							
142	E1/2	B/C	Type 3 Jar	limestone	plain-cordmarked	flattened	5.5	8	25	4.2	438.1	

Comments

a - possible suspension hole
b -thickening on interior lip
c - Orange Madison County Shale paste. Almost certainly this goes with plain, plain cordmarked, and cordmarked sherds
d - vertical stick on superior lip
e - lug
f - possibly same vessel
g - red slip is ncised or smoothed cordmarked

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
142	E1/2	B/C	Type 3 Bowl	limestone	cordmarked	flattened	5.1	40	20	8.3	249.5	a
			Type 3 Bowl	limestone	cordmarked	flattened	5.1	40	10	8.1	95.8	a
142	E1/2	C	Type 3 Bowl	limestone	plain/red slipped	flattened	3.2	18	15	5.7	90.2	
			Type 3 Bowl	limestone	cordmarked	flattened	5.1			7.4	16.9	a,b
			Type 3 Bowl	limestone	cordmarked	flattened	5.6			7.4	19.7	a,b
			Indeterminate	limestone	cordmarked	flattened	5.3			9.0	10.7	
			Type 4 Jar	limestone	plain	flattened	5.4	14	10	6.2	37.9	
			Type 4 Jar	limestone	plain	flattened	2.5			5.0	7.1	
				limestone	plain						5.2	
144	S1/2		Type 3 Jar	limestone	plain	flattened	3.5				5..7	
			Indeterminate	limestone	plain	flattened	2.7				1.6	
147	W1/2		Indeterminate	limestone	plain	flattened	5.0				4.0	
!48	E1/2 &W1/2		Type 4 Jar	limestone	plain & cordmarked	flattened	4.6	16	25	3.0	170.9	
149	N1/2	B	Indeterminate	grog	cordmarked	flattened	5.7				4.4	
150	E1/2		Type 2 Bowl	limestone	cordmarked	flattened	4.9			10.0	167.3	
153	W1/2		Indeterminate	limestone	cordmarked	flattened	5.3				3.0	
154	N1/2	A & B	Type 3 Bowl	limestone	cordmarked	flattened	6.3			5.5	28.0	
			Type 2 Bowl	limestone	cordmarked	flattened	6.5			5.0	21.1	
			Type 2 Bowl	limestone	cordmarked	flattened	6.8			5.0	46.5	
			Type 2 Bowl	limestone	red slipped/red slipped	rounded	3.0				4.0	
			Type 4 Jar	grog	plain	rounded	5.0				9.2	c
154	PP 1		Indeterminate	limestone	red slipped/red slipped	flattened	4.9				5.9	d,e
154	N1/2	PP 2	Type 4 Jar	limestone	plain	flattened	6.0				19.0	
154	S1/2		Type 4 Jar	limestone	cordmarked	flattened	4.8	16	15	5.8	57.2	
			Indeterminate	limestone	red slipped/red slipped	flattened	3.0				4.0	
			Indeterminate	limestone	red slipped/red slipped	flattened	7.0				3.7	
155	NE1/2	A	Type 3 Indeterminate	limestone	cordmarked	flattened	4.0				5.9	
			Type 3 Bowl	limestone	cordmarked	flattened	4.7				11.7	
			Type 3 Bowl	limestone	cordmarked	flattened	4.5				12.8	
155	S1/2		Type 3 Jar	limestone	plain	flattened	4.5				17.6	
			Indeterminate	limestone	plain	flattened	3.4				3.3	
			Type 3 Indeterminate	shell	cordmarked	flattened	7.8				9.0	
			Indeterminate	shell	cordmarked	flattened	7.4				2.8	
159	N1/2			grog	plain						1.0	
				grog	plain						2.2	
				shell	plain						2.5	
				limestone	plain						1.7	
			Type 4 Jar	limestone	plain	flattened					43.7	
159	Burned Area		Angled Rim Jar	grog	plain & cordmarked	rounded	2.7	20	50	6.3	197.8	
159	S1/2		Angled Rim Jar	grog	plain	rounded	1.8			55.5	9.4	
				grog	plain						2.4	
				grog	plain						2.1	
				limestone	plain						1.3	
				limestone	plain						2.8	

Comments

a - cordmark
b - same vessel
c - carbonized

d - red slip on the interior and exterior of sherd as well as on the superior lip surface
e - lug prevents determination of vessel form and rim shape

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
160	S1/2		Type 4 Indeterminate	grog	cordmarked	flattened	3.2				7.3	
165	N1/2		Type 3 Jar	grog	cordmarked	flattened	5.7			7.2	36.4	a
165	N1/2		Indeterminate	limestone	cordmarked	flattened	4.5			5.9	6.0	b
				limestone	plain						17.6	
				limestone	plain						4.7	
165	S1/2		Indeterminate Jar	limestone	cordmarked	flattened	5.0			6.0	56.3	
				limestone	cordmarked						1.7	
				limestone	cordmarked						3.2	
				limestone	smoothed cordmarked						9.3	
			Type 3 Jar	limestone	incised	flattened	4.4			5.6	29.3	c
170	W1/2	B	Indeterminate Jar	grog	cordmarked	flattened	6.6			6.2	29.2	
172	W1/2		Indeterminate	grog	cordmarked	flattened	4.0				9.7	
177	E1/2		Type 3 Jar	grog	plain	rounded	1.7				5.4	
			Type 3 Jar	limestone	cordmarked	flattened	4.5				13.7	
177	W1/2		Type 4 Indeterminate	limestone	smoothed cordmarked	flattened	4.9				9.3	
178	N1/2		Type 4 Jar	limestone	plain & cordmarked	flattened	4.4	18	20	3.8	58.2	
			Type 4 Jar	grog	cordmarked	flattened	5.5				54.9	
			Indeterminate	limestone	red slipped/red slipped	flattened	4.4				6.6	
			Indeterminate	limestone	plain	flattened	2.8				1.9	
			Indeterminate	limestone	plain	flattened	3.0				1.7	
			Indeterminate	limestone	plain	flattened					3.7	d
			Indeterminate	limestone	cordmarked	flattened	6.0				3.5	
			Type 3 Bowl	limestone	plain	flattened	4.5				112.5	
			Type 3 Indeterminate	limestone	plain	flattened	5.8				12.0	
			Indeterminate	limestone	plain	flattened	4.2				2.5	
			Indeterminate	limestone	plain	flattened	4.0				2.6	
			Indeterminate	limestone	plain	flattened	2.5				2.3	
			Type 3 Indeterminate	limestone	cordmarked	flattened	5.5				6.4	
182	N1/2		Type 3 Bowl	limestone	plain & cordmarked	flattened	4.3			3.2	7.1	
210	S1/2		Type 3 Bowl	limestone	cordmarked	flattened	5.0			6.6	16.3	
210	N1/2			limestone	eroded						1.1	
			Type 3 Bowl	limestone	plain/red red slipped	flattened	4.7			3.7	11.9	
				limestone	plain/red red slipped	flattened					4.0	
				limestone	cordmarked						4.5	
				limestone	cordmarked						2.4	
			Angled Rim Jar	limestone	plain	flattened	9.0	19	10	9.0	31.9	
				limestone	plain	flattened					1.1	
				limestone	plain						1.5	
221	E1/2			limestone	plain							
				limestone	plain/red red slipped							
				limestone	plain/red red slipped							
				limestone	plain/red red slipped							
			Type 3 Jar	limestone	Incised	flattened	4.5				11.6	
			Type 3 Jar	limestone	plain	rounded	4.1	20	15	6.8	32.8	
				limestone	plain							

Comments

a - superior of surface of rim cordmarked
b - suspension hole
c - possibly incised
d - not a rim, just a lug

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
221	E1/2			limestone	plain							
				limestone	plain							
				limestone	plain							
				limestone	plain							
				limestone	plain							
				limestone	plain							
				limestone	plain							
				limestone	plain							
221	E1/2			limestone	plain							
			Indeterminate Jar	limestone	plain & cordmarked	flattened	2.5			5.6	54.1	
			Type 4 Indeterminate	limestone	cordmarked	flattened	7.0			8.1	22.5	
				limestone	cordmarked							
				limestone	cordmarked							
				limestone	cordmarked							
221	W1/2		Angled Rim Jar	grog	plain/red slipped	rounded	2.5	10	20		8.0	a
			Angled Rim Jar	grog	plain/red slipped	rounded	2.4	10			5.5	a
			Type 3 Bowl	limestone	cordmarked	flattened	6.3			5.5	8.9	
				limestone	cordmarked						4.7	
			Type 4 Jar	limestone	plain	flattened	6.7	24	10	6.3	82.9	
			Type 4 Indeterminate	limestone	plain	flattened	5.2			5.6	10.6	
			Type 3 Bowl	limestone	plain	flattened	5.0			5.5	10.9	
			Type 3 Jar	limestone	plain & cordmarked	flattened	5.3	26	15	6.2	200.4	
				limestone	plain						9.4	
				limestone	plain						10.8	
				limestone	plain						4.1	
				limestone	plain						5.2	
				limestone	plain						2.3	
				limestone	plain						4.5	
				limestone	plain						5.5	
				limestone	plain						8.3	
				limestone	plain						1.7	
				limestone	plain						2.5	
221	W1/2		Indeterminate Jar	limestone	plain & cordmarked	flattened	4.8			9.0	34.0	
				limestone	plain						7.5	
				limestone	plain						9.0	
221	W1/2	A	Type 4 Indeterminate	limestone	smoothed cordmarked	flattened	5.8			6.7	33.1	
			Type 3 Jar	limestone	plain	flattened	4.4			5.6	17.8	
			Type 3 Jar	limestone	plain	flattened	6.2			6.1	57.8	
				limestone	plain						10.8	
223	E1/2		Type 3 Jar	shell	plain	flattened	5.4				6.6	
			Type 3 Jar	limestone	red slipped/red slipped	flattened	7.7				36.7	b
			Type 4 Jar	limestone	plain	flattened	7.0				18.4	
			Indeterimate	limestone	plain	flattened	5.7				2.3	
223	W1/2	A	Indeterimate	limestone	plain	extruded	9.3				9.3	
226	E1/2		Type 2 Bowl	limestone & shell	cordmarked	flattened	7.1				27.4	
226	W1/2		Type 5 Indeterminate	limestone	cordmarked	flattened	7.1				18.2	

Comments

a - possible same vessel

b - pressed or punctuated decoration near rim;suspension hole

APPENDIX B
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
226	W1/2		Type 4 Indeterminate	limestone	cordmarked	flattened	6.8				16.9	
228	W1/2	B1 & B2	Type 5 Jar	limestone	smoothed cordmarked	flattened	5.2				136.0	
			Type 4 Jar	limestone	plain & cordmarked	flattened	7.1				47.0	
			Type 2 Bowl	limestone	cordmarked	flattened	6.9				33.8	
			Type 2 Bowl	limestone	cordmarked	flattened	5.6				15.2	
			Type 2 Bowl	limestone	cordmarked	flattened	5.8				14.7	
228	W1/2	C1	Type 3 Jar	limestone	plain & cordmarked	flattened	6.7				80.9	
			Type 4 Jar	limestone	plain & cordmarked	flattened	5.8				66.6	
			Type 2 Bowl	limestone	cordmarked	flattened	6.2	44	10	7.9	124.3	
229	E1/2		Type 4 Jar	gorg	smoothed cordmarked	flattened	4.5				4.4	
			Type 4 Jar	limestone	cordmarked	flattened	3.6	9	45		55.9	
			Type 3 Bowl	limestone	cordmarked	flattened	7.5			8.8	232.1	
			Type 4 Indeterminate	limestone	cordmarked	flattened	5.3				55.2	
			Type 4 Jar	limestone	cordmarked	flattened	5.0				39.5	
			Type 2 Bowl	limestone	cordmarked	flattened	4.7			8.2	41.6	
			Type 2 Bowl	limestone	cordmarked	flattened	4.6			7.7	50.7	
			Type 3 Indeterminate	limestone	cordmarked	flattened	4.9				29.3	
			Type 4 Jar	limestone	cordmarked	flattened	5.1				29.4	
			Type 2 Bowl	limestone	cordmarked	flattened	6.1				31.2	
			Type 3 Bowl	limestone	cordmarked	flattened	5.8				21.0	
			Type 3 Indeterminate	limestone	cordmarked	flattened	6.3				19.9	
			Type 3 Indeterminate	limestone	cordmarked	flattened	5.0				16.6	
			Type 6 Indeterminate	limestone	cordmarked	flattened	5.0				9.9	
			Type 3 Indeterminate	limestone	cordmarked	flattened	5.6				13.0	
229	W1/2	Profile IV	Type 3 Bowl	limestone	cordmarked	flattened	6.3			9.0	110.4	
			Indeterimate Jar	limestone	cordmarked	flattened					5.8	
230	E1/2	B	Type 4 Jar	grog	cordmarked	rounded	3.1				10.8	
			Type 4 Indeterminate	limestone	cordmarked	flattened	5.1				5.8	
233	E1/2		Type 4 Jar	limestone	smoothed cordmarked	flattened	6.2	24	20		169.2	
			Type 4 Jar	limestone	cordmarked	flattened	5.0				35.5	
235	W1/2	A2	Angled Rim Jar	shell	plain	rounded	5.0			5.2	4.4	
236	E1/2		Type 4 Jar	shell & grog	cordmarked	flattened	3.2				17.5	
			Indeterminate	shell & grog	cordmarked	flattened	6.0				9.6	
			Type 4 Jar	limestone	smoothed cordmarked	flattened	5.7				29.6	
			Type 3 Jar	limestone	smoothed cordmarked & cordmarked	flattened	5.2	34	10	4.4	190.9	
255	W1/2			grog	cordmarked						1.6	
				limestone	smoothed cordmarked						6.8	
				limestone	plain	flattened	4.1				2.2	
				limestone	cordmarked						6.4	
				limestone	cordmarked						5.9	
255	E1/2			limestone	plain							
			Type 3 Bowl	limestone	cordmarked	flattened	6.3			10.1	43.2	
256	S1/2		Type 3 Jar	limestone	plai & cordmarked	flattened	4.1	14	10	6.0	82.2	
258	W1/2		Type 4 Indeterminate	limestone	cordmarked	flattened	4.9			6.8	26.6	
258	E1/2		Type 5 Jar	grog	cordmarked	flattened	3.1			5.9	8.3	
259	N1/2	A	Type 3 Bowl	limestone	cordmarked	flattened	6.3			6.4	46.9	
			Type 3 Jar	limestone	plain	flattened	5.1			6.3	29.6	
264	E1/2		Type 3 Jar	limestone	cordmarked	flattened	4.4				15.6	
				limestone	cordmarked							

APPENDIX B.
CERAMIC ATTRIBUTES-Rim Sherds

Feature #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	
264	E1/2			limestone	cordmarked							
				limestone	cordmarked							
				limestone	red slipped	flattened	4.5				17.3	
				limestone	red slipped							
265	S1/2		Indeterminate	limestone	red slipped/red slipped	flattened	5.0				5 6	
266	SW1/2		Type 3 Jar	limestone	smoothed cordmarked	flattened	5.4			6.4	18.9	
				limestone	cordmarked						3.8	
266	W1/2	F	Type 3 Jar	grog	cordmarked	flattened	5.3			7.1	14.2	
266	NE1/2	B		limestone	cordmarked							
			Type 3 Jar	limestone	cordmarked	flattened	6.0	17	20	6.9	164.0	
266	E 1/2		Type 3 Jar	grog	cordmarked	flattened	4.7			4.9	9.4	
NON FEATURES												
49	S1/2		Indeterminate	limestone & grit	plain	flattened	4.5			4.1	17.4	
70	S1/2		Indeterminate	limestone	cordmarked	flattened	7.6				1.5	
99	S1/2		Type 2 Bowl	limestone	cordmarked	flattened	7.3			6.3	36.1	a
99	S1/2		Indeterminate	limestone	cordmarked	flattened	4.0				3.2	
			Indeterminate	limestone	cordmarked	flattened	7.5				9.9	
			Indeterminate	limestone	cordmarked	flattened	4.5				5.4	
			Indeterminate	limestone	cordmarked	flattened	7.5				5.0	
			Indeterminate	limestone	cordmarked	flattened	6.7				3.5	
			Indeterminate	limestone	cordmarked	flattened	6.1				3.0	
			Indeterminate	limestone	cordmarked	flattened	4.0				1.6	
			Type 2 Bowl	limestone	eroded	rounded	3.1				30.1	

TEST UNITS

Unit #	Provenience Portion	Zone	Rim Shape & Vessel Form	Temper	Surface Treatment ext./int. decoration	Lip Shape	Rim Thickness (mm)	Orifice Diameter (cm)	% of Vessel	Max. Body Thickness (mm)	W(g)	Comments
3		0 - 10 cm		limestone	plain & red slipped							

Comments

a - decoration on superior lip surface

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

	Provenience			Surface Treatment		
Feature #	Portion	Zone	Temper	Exterior/Interior	N	W(g)
1-2	N 1/2		limestone	cordmarked	16	78.1
			limestone	croded	4	3.7
			limestone	red slipped over cordmarked	1	4.9
			limestone	smoothed cordmarked	6	13.6
			limestone & grit	smoothed cordmarked	2	11.2
1-2	S 1/2	A	limestone	cordmarked	7	33.4
			limestone	eroded	3	7.2
1-2	S 1/2	B	limestone	cordmarked	13	49.7
			limestone	eroded	3	5.1
1-2	S 1/2	C	limestone	eroded	1	1.5
				Feature 1-2 total	*56*	*208.4*
3	S 1/2	A	limestone	cordmarked	2	2.9
				Feature 3 total	*2*	*2.9*
4	N 1/2		limestone	eroded	6	11.0
			limestone & grit	cordmarked	13	49.8
			limestone & grit	eroded	2	2.7
			limestone & grit	smoothed cordmarked	2	42.4
4	S 1/2		limestone & grit	smoothed cordmarked	3	16.7
				Feature 4 total	*26*	*122.6*
5	N 1/2		limestone	plain	2	6.8
			limestone	cordmarked	67	474.0
			limestone	plain & cordmarked	1	8.1
			limestone	smoothed cordmarked	10	98.5
			limestone	eroded	23	36.6
			grit	plain	1	4.6
			limestone & grit	plain	1	14.6
			limestone & grit	cordmarked	22	222.0
			limestone & grit	red slipped	1	1.6
			limestone & grit	smoothed cordmarked	7	86.0
			limestone & grit	eroded	12	24.6
5	S 1/2		limestone	plain	11	20.5
			limestone	cordmarked	163	1580.7
			limestone	eroded	30	58.1
			limestone	smoothed cordmarked	12	93.4
			grit	cordmarked	5	27.0
			limestone & grit	plain	1	2.1
			limestone & grit	cordmarked	47	208.6
			limestone & grit	plain & cordmarked	1	1.9
			limestone & grit	smoothed cordmarked	5	28.1
			limestone & grit	eroded	7	12.0
			limestone & grog	smoothed cordmarked	1	6.7
				Feature 5 total	*430*	*3016.5*
6	W1/2		limestone	plain	20	58.6
			limestone	cordmarked	77	649.3
			limestone	plain & cordmarked	1	5.4
			limestone	smoothed cordmarked	15	125.0

Note: All interiors are plain unless noted otherwise

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
6	W1/2		limestone	eroded	8	31.7
			limestone	incised	2	13.8
			grit	plain	1	1.9
			grit	cordmarked	9	37.5
			limestone & grit	plain	2	4.8
			limestone & grit	cordmarked	19	117.2
			limestone & grit	plain & cordmarked	1	27.3
			limestone & grit	smoothed cordmarked	1	2.7
			grog	cordmarked	1	105.5
6	E1/2		limestone	plain	59	214.6
			limestone	cordmarked	142	1047.1
			limestone	plain & cordmarked	1	29.6
			limestone	smoothed cordmarked	20	227.8
			limestone	eroded	37	77.8
			grit	plain	5	10.7
			grit	cordmarked	10	30.8
			limestone & grit	plain	1	2.0
			limestone & grit	smoothed cordmarked	2	76.1
			grog	plain	3	9.0
			grog	cordmarked	4	32.6
				Feature 6 total	*441*	*2938.8*
7	N1/2		limestone	plain	1	7.9
			limestone	cordmarked	14	132.7
			limestone	smoothed cordmarked	1	3.9
7	S1/2		limestone	cordmarked	8	50.0
			limestone	eroded	2	2.4
			grog	cordmarked	1	1.9
				Feature 7 total	*27*	*198.8*
8	N1/2		limestone	cordmarked	13	54.0
			limestone	smoothed cordmarked	1	57.3
			limestone	eroded	1	1.8
			limestone & grit	plain	1	1.9
			limestone & grit	cordmarked	7	30.4
			limestone & grit	smoothed cordmarked	1	1.6
			limestone & grit	eroded	1	13.8
			grog	cordmarked	1	9.4
8	S1/2		limestone	cordmarked	34	182.9
			limestone	eroded	6	9.7
			limestone & grog	smoothed cordmarked	1	14.0
			grit	cordmarked	2	7.3
			limestone & grit	cordmarked	14	57.4
			limestone & grit	smoothed cordmarked	2	3.4
				Feature 8 total	*85*	*444.9*
9/158	SE1/4	I	limestone	plain	9	24.8
			limestone	cordmarked	5	20.5
			limestone	red slipped	1	2.6
			limestone	eroded	7	10.5
9/158	SE1/4	I	grog	plain	1	1.5

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
9/158	SE1/4	I	grog	red slipped/red slipped	1	4.6
9/158	SE1/4	II	limestone	plain	2	5.0
			limestone	cordmarked	1	7.9
			shell	plain	21	32.2
9/158	NW1/4	I	limestone	plain	10	72.4
			limestone	eroded	1	2.3
			grog	red slipped	2	3.6
9/158	NW1/4	I	grit	plain	3	8.1
			shell	plain	9	27.0
			shell & grit	plain	6	82.7
			limestone & grit	plain	1	3.7
			limestone & grog	eroded	6	9.8
9/158	NE1/4		limestone	plain	3	6.7
			limestone	cordmarked	2	22.2
			limestone	red slipped	2	2.6
			limestone	eroded	2	25.3
			grog	cordmarked	1	3.4
			shell	plain	4	14.7
			shell	eroded	1	1.0
			limestone & grit	eroded	6	8.6
			shell & grit	plain	5	9.6
			no temper	plain	1	2.3
9/158	SW1/4		limestone	plain	2	6.5
			limestone	cordmarked	2	9.9
			shell	plain	5	82.7
			shell & grit	plain	6	33.7
			grog	plain	1	1.6
				Feature 9/158 total	*129*	*550.0*
10/157	W1/2		limestone	plain	17	42.5
			limestone	cordmarked	5	8.7
			limestone	smoothed cordmarked	5	20.1
			limestone	eroded	4	6.1
			limestone	red slipped/red slipped	1	1.8
			grog	plain	9	27.8
			grog	eroded	1	3.4
			grog	cordmarked	2	3.6
			grog & shell	plain	1	1.0
			shell	plain	2	2.5
			shell & limestone	plain	4	7.1
			limestone & grog	plain	6	24.6
			limestone & grog	eroded	2	9.9
			limestone & grog	cordmarked	5	21.5
			limestone & grit	cordmarked	1	1.7
10/157	E1/2		limestone	plain	6	44.6
			limestone	cordmarked	7	17.7
			limestone	smoothed cordmarked	2	5.1
10/157	E1/2		limestone	red slipped	1	6.7
			limestone	eroded	3	4.7

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
10/157	E1/2		shell & limestone	plain	8	84.6
			shell & limestone	smoothed cordmarked	3	19.1
			shell & limestone	cordmarked	1	1.3
			shell	plain	11	29.9
			shell	eroded	1	1.0
			limestone & grit	plain	1	9.4
				Feature 10/157 total	*109*	*406.4*
15	E1/2		limestone	plain	1	7.0
			limestone	cordmarked	4	21.3
			limestone	smoothed cordmarked	1	9.1
			limestone	eroded	1	1.7
			grog & grit	eroded	3	5.4
			grog & grit	cordmarked	1	7.3
15	W1/2		limestone	plain	2	5.1
			limestone	cordmarked	6	23.5
			limestone	eroded	2	6.3
			limestone & grit	cordmarked	1	10.0
			grog	smoothed cordmarked	1	2.8
				Feature 15 total	*23*	*99.5*
16	W1/2		limestone	plain	5	13.3
			limestone	cordmarked	16	278.3
			limestone	eroded	5	9.5
			grog	eroded	1	1.7
16	E1/2		limestone	cordmarked	3	35.4
			limestone	eroded	3	7.4
				Feature 16 total	*33*	*345.6*
17	S1/2		grog	cordmarked	1	11.4
				Feature 17 total	*1*	*11.4*
20	W1/2		limestone	plain	17	32.4
			limestone	cordmarked	7	28.4
			limestone	smoothed cordmarked	5	29.7
			limestone	eroded	25	51.2
			grog	plain	2	2.6
20	E1/2		limestone	smoothed cordmarked	4	17.5
				Feature 20 total	*60*	*161.8*
21	W1/2		limestone	cordmarked	31	512.6
			limestone	smoothed cordmarked	13	43.2
			limestone	eroded	13	22.0
			limestone & grit	cordmarked	1	18.3
			limestone & grit	smoothed cordmarked	2	2.5
			limestone & grit	eroded	1	3.2
			grog	plain	2	6.8
			grog	cordmarked	1	10.0
21	E1/2	A	limestone	plain	6	56.8
			limestone	cordmarked	24	160.2
21	E1/2	A	limestone	smoothed cordmarked	5	156.2
			limestone	eroded	2	2.6
			grog	cordmarked	2	6.1

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
21	E1/2	A	grog	cordmarked & plain	1	25.3
21	E1/2	B	limestone	cordmarked	9	138.3
			limestone	smoothed cordmarked	1	61.9
			limestone	eroded	3	7.9
21	E1/2	D	limestone	plain	3	10.9
			limestone	cordmarked	8	178.8
			limestone	eroded	3	7.3
			grit	plain	1	3.9
21	E1/2	E	limestone	cordmarked	2	7.7
			limestone	eroded	1	1.3
			limestone & grit	smoothed cordmarked	1	11.4
21	E1/2	E	grog	cordmarked	2	6.9
			grog	plain	2	4.0
21	E1/2	F	limestone	cordmarked	6	27.2
			grog	cordmarked	2	21.7
21	E1/2	rodent run	limestone	plain	1	1.4
			limestone	cordmarked	11	62.0
			limestone	smoothed cordmarked	1	15.7
				Feature 21 total	*67*	*758.5*
22	E1/2		limestone	plain	4	10.8
			limestone	cordmarked	15	46.7
			limestone	eroded	7	13.7
			grit	plain	2	3.0
			shell	red slipped	9	57.2
			grog	cordmarked	6	47.4
22	W1/2		limestone	plain	3	5.8
			limestone	cordmarked	3	5.5
			limestone	eroded	1	1.0
			shell	red slipped	1	4.9
			grog	cordmarked	4	30.0
				Feature 22 total	*55*	*226.0*
23	surface scatter		limestone	plain	9	73.3
			limestone	cordmarked	46	388.6
			limestone	plain & cordmarked	1	2.6
			limestone	smoothed cordmarked	6	37.7
			limestone	eroded	4	7.2
			grog	cordmarked	8	17.5
			shell & limestone	cordmarked	1	5.9
			limestone & grit	plain	1	2.5
			limestone & grit	cordmarked	3	45.1
			no temper	plain	2	10.1
23	SW1/4		limestone	plain	60	292.7
			limestone	cordmarked	169	1479.4
			limestone	plain & cordmarked	4	99.4
23	SW1/4		limestone	smoothed cordmarked	24	155.3
			limestone	eroded	36	112.3
			grit	cordmarked	3	14.7
			grog	cordmarked	6	170.5

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
23	SW1/4		grog	plain	1	3.0
23	SW1/4		grog	eroded	1	2.7
			grit & grog	cordmarked	3	28.1
23	NW1/4		limestone	plain	26	170.7
			limestone	cordmarked	83	545.0
			limestone	plain & cordmarked	4	92.1
			limestone	smoothed cordmarked	5	49.4
			limestone	eroded	7	13.8
			limestone & grog	cordmarked	9	100.1
			limestone & grog	eroded	5	21.7
			limestone & grit	plain	2	4.5
			limestone & grit	cordmarked	2	38.2
23	NW1/4		grog	plain (pinchpot)	1	2.5
			grog	plain	1	6.0
			grog	smoothed cordmarked	1	13.6
			grog	cordmarked	2	7.0
23	E1/2		limestone	plain	76	330.4
			limestone	cordmarked	240	1911.9
			limestone	plain & cordmarked	8	169.2
			limestone	smoothed cordmarked	19	170.7
			limestone	red slipped	1	2.2
			limestone	eroded	38	83.8
			limestone	grooved	1	3.6
			limestone	cordmarked/red slipped	1	1.6
			limestone & grog	plain	2	18.2
			grit	plain	2	18.2
			grit	cordmarked	4	6.7
			grit	smoothed cordmarked	3	16.2
			grit & grog	cordmarked	2	4.9
			shell	plain	1	1.4
			shell & limestone	plain	1	1.9
			limestone & grit	plain	3	20.9
			limestone & grit	cordmarked	1	7.2
			grog	plain	2	7.4
			grog	cordmarked	18	56.4
			grog	eroded	1	7.1
			no temper	plain	4	24.7
				Feature 23 total	*964*	*6877.8*
27	E1/2		limestone	cordmarked	9	37.2
			limestone	eroded	1	2.8
				Feature 27 total	*10*	*40.0*
27	W1/2		limestone	cordmarked	30	235.8
			limestone	eroded	8	23.3
				Feature 27 total	*38*	*259.1*
31	S1/2	A	limestone	plain	2	5.9
			limestone	cordmarked	24	141.8
			limestone	plain & cordmarked	1	12.8
			limestone	smoothed cordmarked	2	23.8

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
31	S1/2	A	limestone	eroded	2	3.2
			limestone	incised	1	2.0
			quartz	plain	3	7.2
			quartz	cordmarked	27	206.8
			grog	plain & cordmarked	9	54.9
31	N1/2	A	limestone	plain	10	17.4
			limestone	cordmarked	31	176.1
			grit	cordmarked	1	4.8
			grog	cordmarked	2	8.5
			quartz	plain	2	4.2
			quartz	cordmarked	4	7.5
				Feature 31 total	*121*	*676.9*
33	E1/2		limestone	plain	2	3.2
			limestone	cordmarked	12	50.2
			limestone	eroded	3	5.4
			limestone & grog	cordmarked	1	3.1
			grog	plain	1	11.3
			grog	cordmarked	2	24.5
			quartz & grog & grit	cordmarked	1	20.3
			quartz & grit	cordmarked	1	6.9
33	W1/2	A	limestone	cordmarked	2	3.9
33	W1/2	B	limestone	plain	2	3.1
			limestone	cordmarked	7	12.4
			limestone	eroded	1	1.1
			grog	plain	3	25.6
			quartz	cordmarked	1	8.9
			grit/MCS	plain	1	1.9
33	W1/2	C	limestone	cordmarked	1	4.3
				Feature 33 total	*41*	*186.1*
34	N1/2	A	limestone	plain	7	28.2
			limestone	cordmarked	22	77.8
			limestone	red slipped & cordmarked	1	5.1
			limestone	eroded	6	13.4
			grit	plain	2	8.2
			grit	cordmarked	3	6.4
			grog	plain	3	4.3
			grog	cordmarked	1	23.0
			grog	eroded	1	4.1
			no temper	cordmarked	1	3.1
34	S1/2	A	limestone	plain	9	44.9
34	S1/2	A	limestone	cordmarked	17	85.6
			limestone	eroded	2	3.0
			grit	plain	2	3.9
			grit	cordmarked	1	4.2
			grog	cordmarked	2	16.6
				Feature 34 total	*33*	*158.2*
36	S1/2		limestone	plain	5	15.1
			limestone	cordmarked	67	315.6

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
36	S1/2		limestone	smothed cordmarked	3	21.0
36	S1/2		limestone	eroded	25	49.9
			grit	cordmarked	2	4.6
			grit	cordmarked	30	396.4
			grit	plain	1	2.2
			grog	plain	2	3.9
			grog	cordmarked	8	32.4
			no temper	plain	5	56.6
36	N1/2		limestone	plain	5	11.9
			limestone	cordmarked	28	146.8
			limestone	smothed cordmarked	5	16.9
			limestone	eroded	12	23.8
			grit	cordmarked	2	2.2
			grit	cordmarked	39	350.5
			grit & grog	cordmarked	1	5.3
			grog	plain	2	7.3
			grog	cordmarked	4	18.3
36	N1/2	conc. 2	grit	cordmarked	2	16.4
			limestone	cordmarked	88	422.8
				Feature 36 total	*336*	*1919.9*
38	N1/2		limestone	plain	1	1.8
			limestone	cordmarked	56	280.4
			limestone	smoothed cordmarked	5	19.7
			limestone	eroded	11	29.2
			grit	plain	1	4.3
			grit	cordmarked	2	11.2
			grog	cordmarked	1	2.6
			grog	smoothed cordmarked	1	3.2
38	S1/2		limestone	plain	4	15.8
			limestone	cordmarked	122	604.0
			limestone	smoothed cordmarked	5	16.1
			limestone	red slipped	1	1.6
			limestone	eroded	46	117.4
			grit	plain	1	5.3
			grit	cordmarked	2	16.2
			grit	eroded	1	2.3
			grog	cordmarked	1	23.4
			grog	smoothed cordmarked	1	9.2
				Feature 38 total	*262*	*1163.7*
40	S1/2		limestone	plain	13	71.2
			limestone	cordmarked	25	195.4
			limestone	plain & cordmarked	2	38.8
			limestone	eroded	12	35.1
			limestone & grog	cordmarked	1	3.3
			grit	plain	1	1.3
			grit	cordmarked	2	3.3
			grit	plain & cordmarked	1	2.1
			grit/MCS	plain	1	6.2

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
40	S1/2		grit & grog	cordmarked	1	1.2
			limestone & grit	plain	2	7.2
			limestone & grit	cordmarked	13	36.6
			limestone & grit	eroded	2	3.7
			grog	plain	4	9.1
			grog	cordmarked	1	1.1
40	N1/2		limestone	plain	18	72.3
			limestone	cordmarked	29	1.5
			limestone	plain & cordmarked	1	1.5
			limestone	cordmarked	1	5.9
			limestone	eroded	4	8.3
			limestone & grog	cordmarked	1	3.0
			limestone & grit	cordmarked	6	12.3
			grog	plain	3	4.2
				Feature 40 total	*144*	*524.6*
41	W1/2	A	grog	cordmarked	1	2.1
				Feature 41 total	*1*	*2.1*
42	N1/2		limestone	cordmarked	43	274.1
			limestone	smoothed cordmarked	5	45.4
			limestone	eroded	5	31.2
			limestone & grit	cordmarked	4	50.3
			limestone & grog	cordmarked	2	22.5
			grog	cordmarked	1	6.8
			grog & grit	cordmarked	2	20.7
			grog & grit	smoothed cordmarked	1	6.8
42	S1/2		limestone	cordmarked	15	86.9
			limestone	smoothed cordmarked	4	90.9
			limestone	eroded	7	39.6
			limestone & grog	smoothed cordmarked	1	47.9
			limestone & grog	cordmarked	3	41.7
			limestone & grog	plain	1	4.5
			limestone & grit	cordmarked	3	29.7
			grog	smoothed cordmarked	1	5.4
			grog & grit	plain	1	2.3
			grog & grit	cordmarked	4	45.0
				Feature 42 total	*103*	*851.7*
43	S1/2		limestone	plain	1	3.9
				Feature 43 total	*1*	*3.9*
44	E1/2		grit	cordmarked	3	7.7
				Feature 44 total	*3*	*7.7*
45	N1/2		no temper	plain	2	5.4
45	S1/2		grit & grog	cordmarked	3	27.4
				Feature 45 total	*5*	*32.8*
46	E1/2		limestone	cordmarked	9	39.7
			limestone	smoothed cordmarked	4	6.2
			limestone	eroded	2	2.6
			grit	plain	1	3.5
			grit	cordmarked	1	3.8

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
46	E1/2		grog	cordmarked	1	3.7
			grog	eroded	1	1.2
			grog	plain	2	4.3
			limestone & grog	plain	1	10.4
			limestone & grit	cordmarked	3	17.0
			limestone & grit	smoothed cordmarked	2	10.2
46	W1/2		limestone	plain	3	11.5
			grog	plain	6	17.3
			grog	smoothed cordmarked	1	12.4
			grit	cordmarked	1	11.4
			limestone & grit	cordmarked	2	4.7
			limestone & grit	eroded	2	3.2
				Feature 46 total	*42*	*163.1*
47	W1/2	A	limestone	plain	4	9.7
			limestone	cordmarked	26	138.7
			limestone	red slipped	1	1.3
			limestone	eroded	5	13.3
			limestone & grit	plain	1	8.5
			grog	cordmarked	1	3.7
47	E1/2	A	limestone	plain	4	7.9
			limestone	cordmarked	10	46.9
			limestone	smoothed cordmarked	13	40.6
			limestone	eroded	2	2.0
			grog	cordmarked	1	7.3
			limestone & grog	cordmarked	1	4.4
			limestone & grit	plain	1	2.0
			limestone & grit	cordmarked	20	106.0
			limestone & grit	smoothed cordmarked	22	81.6
			limestone & grit	red slipped	2	8.2
			limestone & grit	eroded	3	9.5
			no temper	plain	1	7.4
47	E1/2	B	limestone	plain	3	9.8
			limestone	cordmarked	24	106.7
			limestone	eroded	4	6.4
47	E1/2	B	grog	plain	1	2.6
			grog	cordmarked	1	2.8
47	E1/2	C	limestone	cordmarked	5	16.6
			limestone	eroded	2	3.5
				Feature 47 total	*9*	*25.5*
48	NW1/2		limestone	plain	34	133.4
			limestone	cordmarked	79	468.2
			limestone	plain & cordmarked	1	16.7
			limestone	smoothed cordmarked	2	7.7
			limestone	eroded	14	36.8
			grit	plain	3	17.3
			grog	plain	1	3.0
			limestone & grit	plain	3	4.1
			limestone & grit	cordmarked	5	18.5

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
48	E1/2		limestone	plain	40	159.6
			limestone	cordmarked	47	468.4
			limestone	plain & cordmarked	2	74.6
			limestone	smoothed cordmarked	7	48.9
			limestone	red slipped	1	15.4
			limestone	eroded	2	3.6
			shell	plain	2	51.4
			limestone & grit	plain	3	13.7
			limestone & grit	cordmarked	2	6.4
			grog	cordmarked	1	15.6
				Feature 48 total	*249*	*1563.3*
51	S1/2		grog	plain	1	3.1
				Feature 51 total	*1*	*3.1*
55	W1/2		limestone	plain	4	11.1
			limestone	cordmarked	13	219.1
			limestone	eroded	6	7.9
			grog	cordmarked	2	3.6
			grit	cordmarked	2	8.2
55	E1/2		limestone	cordmarked	11	54.1
			limestone	smoothed cordmarked	1	5.2
			grit	plain	1	1.7
			grog	cordmarked	1	0.8
				Feature 55 total	*41*	*311.7*
57	S1/2		limestone	plain	1	1.4
			limestone	cordmarked	2	3.7
				Feature 57 total	*3*	*5.1*
60	NE1/2		limestone	eroded	1	3.0
				Feature 60 total	*1*	*3.0*
61	N1/2		limestone	plain	12	64.1
			limestone	cordmarked	21	83.7
			limestone	smoothed cordmarked	4	35.7
			limestone	eroded	8	16.9
61	N1/2		grog	plain	3	6.7
			grog	cordmarked	1	15.4
			grit & grog	plain	3	13.5
			grit & grog	cordmarked	5	16.6
61	S1/2	1	limestone	plain	4	8.5
			limestone	cordmarked	17	58.8
			limestone	smoothed cordmarked	3	25.8
			grit	plain	3	12.7
			grit	cordmarked	4	13.6
			limestone & grit	plain	4	12.0
			limestone & grit	cordmarked	3	10.9
			grog	plain	1	0.9
			grog	cordmarked	2	8.4
61	S1/2	2 & 3	limestone	plain	7	25.6
			limestone	cordmarked	14	155.7
			limestone	smoothed cordmarked	1	19.4

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
61	S1/2	2 & 3	limestone	eroded	7	12.9
			grit & grog	cordmarked	6	59.2
			limestone & grit	plain	2	6.9
			limestone & grit	cordmarked	2	4.6
			limestone & grit	eroded	1	2.1
			grog	cordmarked	2	4.2
				Feature 61 total	*140*	*694.8*
62	E1/2		limestone	cordmarked	32	143.8
			limestone	red slipped	1	5.1
			limestone & grit	plain	2	3.4
			limestone & grit	cordmarked	1	3.1
62	W1/2	1	limestone	plain	1	1.3
			limestone	cordmarked	2	2.9
62	W1/2	2	limestone	cordmarked	2	3.3
			grit	plain	1	2.6
			grit & grog	cordmarked	1	2.9
			limestone & grit	plain	2	3.2
			limestone & grit	cordmarked	1	8.0
				Feature 62 total	*46*	*179.6*
63	S1/2		limestone	cordmarked	2	4.2
			limestone & grit	eroded	1	1.3
63	N1/2		limestone & grit	cordmarked	3	13.0
			no temper	plain	1	5.6
				Feature 63 total	*7*	*24.1*
64	W1/2	A1	limestone	cordmarked	8	78.4
			limestone	eroded	1	2.4
			grit & grog	cordmarked	1	1.8
64	W1/2	A2	limestone	plain	4	9.7
			limestone	cordmarked	6	21.4
			limestone	smoothed cordmarked	2	11.7
			limestone	eroded	2	6.7
			grog	smoothed cordmarked	1	4.6
			grog	eroded	1	1.7
64	E1/2	A	limestone	plain	3	8.6
			limestone	cordmarked	55	296.9
64	E1/2	A	limestone	smoothed cordmarked	1	6.8
			limestone	eroded	14	29.7
			grit	plain	4	11.9
			grit	cordmarked	15	39.5
			grit	smoothed cordmarked	4	19.4
			grog	cordmarked	3	19.8
			grog	plain	2	38.5
				Feature 64 total	*127*	*609.5*
65	E1/2		limestone	plain	3	8.2
			limestone	cordmarked	6	35.8
			limestone	red slipped	1	1.3
			limestone	eroded	9	19.2
			grog	cordmarked	5	15.9

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
65	W1/2	A	limestone	cordmarked	4	7.8
			limestone	smoothed cordmarked	1	14.2
			limestone	eroded	2	3.4
65	W1/2	B	limestone	cordmarked	2	3.2
			limestone	smoothed cordmarked	1	10.9
			grog	cordmarked	3	12.4
				Feature 65 total	*37*	*132.3*
67	E1/2		limestone	plain	7	17.3
			limestone	cordmarked	8	33.0
			limestone	eroded	2	8.7
			grog	plain	3	8.8
			grit	plain	1	5.7
			grit	cordmarked	2	5.9
67	W1/2	C	limestone	cordmarked	2	8.5
67	W1/2	E	limestone	plain	2	14.2
			limestone	cordmarked	14	106.1
			limestone	eroded	6	9.4
			grog	cordmarked	1	2.8
				Feature 67 total	*48*	*220.4*
72	W1/2		limestone	cordmarked	42	250.7
			limestone	smoothed cordmarked	3	7.2
			limestone	eroded	2	9.1
			grit	cordmarked	1	1.5
			grog	eroded	1	3.0
			grog	plain	1	2.8
			grog	cordmarked	1	3.1
72	E1/2	A	limestone	cordmarked	8	27.1
			limestone	eroded	1	1.3
			grit	cordmarked	2	3.8
72	E1/2	B	limestone	plain	1	2.1
			limestone	cordmarked	6	44.8
			limestone	eroded	3	5.4
			grit	cordmarked	1	2.0
72	E1/2	C	limestone	plain	1	1.5
72	E1/2	C	limestone	cordmarked	25	179.4
			limestone	plain & cordmarked	3	9.4
			limestone	eroded	4	10.4
			grog	plain	1	4.0
				Feature 72 total	*107*	*568.8*
77	S1/2	A	limestone	plain	10	36.3
			limestone	cordmarked	36	598.0
			limestone	plain & cordmarked	1	26.0
			limestone	smoothed cordmarked	3	30.3
			limestone	eroded	9	29.5
			grit	smoothed cordmarked	1	5.5
			grit	plain	1	3.0
			grit	cordmarked	3	17.3
			grit & grog	cordmarked	2	9.1

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
77	N1/2	A1	limestone	plain	10	43.3
			limestone	cordmarked	58	350.1
			limestone	plain & cordmarked	1	21.3
			limestone	eroded	5	23.4
			grit	plain	2	9.0
			grit	cordmarked	4	21.0
77	N1/2	A2	limestone	cordmarked	9	53.0
			grit	plain & cordmarked	1	2.6
				Feature 77 total	*156*	*1278.7*
79	S1/2		limestone	plain	21	122.2
			limestone	cordmarked	149	1140.4
			limestone	plain & cordmarked	5	57.7
79	S1/2		limestone	smoothed cordmarked	12	89.3
			limestone	red slipped	2	4.8
			limestone	eroded	6	7.6
			limestone & shell	cordmarked	16	51.0
			grog	plain	3	6.8
			grog	cordmarked	4	5.8
79	N1/2	A	limestone	plain	9	22.6
			limestone	cordmarked	26	122.0
			limestone	plain & cordmarked	2	576.0
			limestone	smoothed cordmarked	2	11.2
			limestone	eroded	3	4.5
			grit	cordmarked	1	10.9
			grog	cordmarked	2	4.4
			limestone & shell	cordmarked	1	1.2
79	N1/2	B	limestone	plain	15	100.7
			limestone	cordmarked	98	1191.7
			limestone	plain & cordmarked	2	15.2
			limestone	smoothed cordmarked	2	7.0
			limestone	eroded	2	1.7
			grog	cordmarked	1	5.3
			limestone & shell	cordmarked	3	9.1
79	N1/2	C	limestone	plain	7	19.4
			limestone	cordmarked	22	222.3
			limestone & shell	cordmarked	1	2.7
79	N1/2	D	grit	cordmarked	1	2.9
				Feature 79 total	*243*	*2496.1*
80	S1/2		limestone	plain	15	62.8
			limestone	cordmarked	60	409.4
			limestone	plain & cordmarked	3	114.5
			limestone	smoothed cordmarked	14	49.0
			limestone	eroded	8	23.3
			shell	plain	1	2.8
			shell	cordmarked	5	9.3
			shell	smoothed cordmarked	2	9.0
			grog	cordmarked	1	14.8
80	N1/2	A	limestone	plain	3	14.0

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
80	N1/2	A	limestone	cordmarked	5	41.7
			grog	plain	1	13.8
80	N1/2	B	limestone	plain	1	5.5
			limestone	cordmarked	2	6.6
			shell	plain	1	2.6
80	N1/2	C	limestone	cordmarked	7	50.2
			limestone	eroded	1	5.2
			shell	cordmarked	1	11.4
				Feature 80 total	*131*	*845.9*
81	W1/2		limestone	plain	1	2.5
			limestone	cordmarked	10	58.3
			limestone	smoothed cordmarked	5	271.8
			limestone & grog	eroded	1	4.2
			limestone & grit	cordmarked	12	65.2
			limestone & grit	smoothed cordmarked	1	6.7
81	E1/2	A	limestone	cordmarked	8	75.0
			limestone & grit	cordmarked	7	57.9
			limestone & grit	smoothed cordmarked	1	25.2
81	E1/2	B	limestone	plain	1	1.9
			limestone	cordmarked	10	116.0
				Feature 81 total	*57*	*684.7*
82	S1/2		limestone	plain	15	105.1
			limestone	cordmarked	141	1120.0
			limestone	plain & cordmarked	1	6.1
			limestone	smoothed cordmarked	15	81.6
			limestone	eroded	32	93.2
			grit	cordmarked	5	26.1
			grit	plain	2	16.9
			grit/MCS	cordmarked	13	85.9
			shell	plain	2	4.7
			grog	cordmarked	1	10.0
			grog	smoothed cordmarked	1	19.8
82	S1/2		grog	eroded	1	5.7
			grog	plain	1	10.3
82	N1/2	A1	limestone	plain	9	72.6
			limestone	cordmarked	94	788.3
			limestone	plain & cordmarked	1	24.7
			limestone	smoothed cordmarked	11	36.7
			limestone	eroded	7	28.7
			grit	plain	1	6.0
			grit	cordmarked	1	20.6
			grit	plain & cordmarked	1	39.2
			grit/MCS	plain	1	18.8
82	N1/2	B2	limestone	cordmarked	2	4.9
			limestone	eroded	1	1.1
			grit	smoothed cordmarked	1	5.1
82	N1/2	C3	limestone	plain	3	11.2
			limestone	cordmarked	20	161.8

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
82	N1/2	C3	limestone	smoothed cordmarked	12	36.1
			grit	cordmarked	1	0.8
			grit/MCS	cordmarked	12	143.5
				Feature 82 total	*408*	*2985.5*
83	N1/2		limestone	plain	2	2.8
			limestone	cordmarked	8	55.7
			limestone	eroded	2	3.7
83	N1/2		grog	cordmarked	1	1.3
			limestone & grog	eroded	8	16.0
			limestone & grog	plain	3	13.3
			limestone & grog	cordmarked	2	7.7
			limestone & grit	cordmarked	13	48.6
83	S1/2		limestone	plain	5	8.2
			limestone	cordmarked	5	25.5
			limestone & grit	cordmarked	4	72.1
			limestone & grit	eroded	1	1.7
			limestone & grog	cordmarked	1	2.3
				Feature 83 total	*43*	*196.7*
87	SW1/4		limestone & grit	cordmarked	2	11.7
			limestone & grit	eroded	1	3.9
			grog	eroded	1	17.9
87	NW1/4		limestone	cordmarked	2	5.3
			shell & grog	plain	27	209.8
			shell & grog	cordmarked	1	4.7
			limestone & grit	cordmarked	1	11.6
			limestone & grit	eroded	3	5.8
87	NE1/4		limestone & grit	plain	1	6.6
			grog	plain	1	36.4
87	SE1/4		limestone & grit	plain	1	2.2
			limestone & grit	eroded	5	11.5
87	SE1/4		grog	cordmarked	2	10.5
				Feature 87 total	*48*	*337.9*
88	NW1/4		grog	cordmarked	1	26.6
			limestone & grit	cordmarked	7	35.8
88	SE1/2	A	limestone	plain	1	1.4
			limestone	cordmarked	37	182.8
			limestone	smoothed cordmarked	9	72.0
			limestone	eroded	4	7.2
88	SE1/2	B	limestone & grit	cordmarked	2	10.7
			limestone & grit	smoothed cordmarked	2	14.7
				Feature 88 total	*63*	*351.2*
89	N1/2	A1	limestone	plain	15	75.7
			limestone	smoothed cordmarked	5	18.0
			limestone	eroded	1	5.5
89	N1/2	A2	limestone	plain	2	52.1
			limestone	smoothed cordmarked	1	21.5
89	N1/2	B1	limestone	plain	2	5.2
			limestone	red slipped	1	1.0

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
89	N1/2	B2	limestone	cordmarked	4	14.0
			limestone & grit	cordmarked	1	2.2
89	S1/2		limestone	plain	2	6.3
			limestone	cordmarked	23	242.9
			limestone	smoothed cordmarked	1	14.1
89	S1/2		limestone	plain	2	6.3
			limestone	cordmarked	23	242.9
			limestone	smoothed cordmarked	1	14.1
			limestone	eroded	3	6.2
			limestone & grit	cordmarked	1	9.2
			limestone & grit	smoothed cordmarked	1	8.1
				Feature 89 total	*31*	*286.8*
90	E1/2		limestone	plain	19	3.0
			limestone	cordmarked	153	1453.3
			limestone	plain & cordmarked	1	6.6
			limestone	smoothed cordmarked	3	18.2
			limestone	eroded	8	18.8
			grit	plain	16	109.7
			grit	cordmarked	56	442.5
			grit	plain & cordmarked	4	63.2
			grit	eroded	3	15.8
90	SW1/4		limestone	plain	13	59.0
			limestone	cordmarked	164	1696.7
			limestone	plain & cordmarked	5	89.7
			limestone	smoothed cordmarked	2	14.7
			limestone	eroded	19	48.6
			grit	plain	3	8.2
			grit	cordmarked	5	24.1
			grog	cordmarked	1	3.9
90	NW1/4		limestone	cordmarked	25	117.0
			limestone	smoothed cordmarked	5	22.4
			limestone	eroded	1	1.5
90	PM2		limestone	cordmarked	1	1.1
				Feature 90 total	*507*	*4218.0*
94	E1/2		limestone	plain	1	2.6
			limestone	cordmarked	24	183.7
			limestone	eroded	4	5.2
			grog	cordmarked	2	5.8
			limestone & grit	cordmarked	1	11.7
94	W1/2	A	limestone	plain	13	31.0
			limestone	cordmarked	34	150.4
			limestone	plain & cordmarked	1	9.5
			limestone	smoothed cordmarked	16	148.6
			limestone	eroded	3	7.1
			limestone & grit	cordmarked	2	16.4
94	W1/2	B	limestone	plain	3	10.7
			limestone	cordmarked	27	467.0
			limestone	eroded	4	7.2

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
94	W1/2	B	limestone & shell	cordmarked	1	1.2
				Feature 94 total	*136*	*1058.1*
96	N1/2		limestone	plain	3	13.4
			limestone	cordmarked	86	1454.5
			limestone	plain & cordmarked	1	7.8
			limestone	smoothed cordmarked	6	38.2
			limestone	red slipped	1	2.6
			limestone	eroded	10	33.1
			limestone & grit	cordmarked	2	18.4
96	S1/2		limestone	plain	1	2.4
			limestone	cordmarked	48	323.4
			limestone	plain & cordmarked	1	7.6
			limestone	smoothed cordmarked	1	42.6
			limestone	red slipped	1	3.8
			limestone	eroded	6	46.4
			limestone	plain & cordmarked/red slipped	1	26.3
			grog	cordmarked	1	15.3
				Feature 96 total	*169*	*2035.8*
102	E1/2		limestone	plain	2	12.2
			limestone	cordmarked	5	20.6
			limestone	red slipped	1	2.0
			shell & grog	cordmarked	1	21.0
			grog	cordmarked	1	2.9
			grog	eroded	1	3.7
102	W1/2		limestone	cordmarked	1	7.6
			limestone	eroded	1	5.3
			grog	cordmarked	1	8.2
				Feature 102 total	*14*	*83.5*
103	N1/2		grit	cordmarked	1	2.6
			grit	eroded	1	0.8
103	S1/2		limestone	plain	1	6.0
			limestone	cordmarked	2	3.4
			limestone	eroded	1	3.1
			grog	cordmarked	2	10.0
				Feature 103 total	*8*	*25.9*
104	E1/2		limestone	plain	1	4.1
			limestone	cordmarked	4	26.9
			limestone	smoothed cordmarked	1	2.4
			limestone	eroded	1	3.4
104	W1/2		limestone	plain	3	13.0
104	W1/2		limestone	cordmarked	9	44.8
			limestone	plain & cordmarked	1	20.6
			limestone	eroded	1	2.6
				Feature 104 total	*11*	*68.0*
105	E1/2		limestone	cordmarked	1	1.6
105	W1/2		limestone	cordmarked	2	16.5
			limestone & grit	cordmarked	2	41.6
105	PP 1		limestone	cordmarked	1	3.2

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
105	PP 1		limestone	smoothed cordmarked	1	10.7
				Feature 105 total	*7*	*73.6*
106	E1/2		limestone	cordmarked	1	5.8
106	W1/2		limestone	cordmarked	1	2.7
				Feature 106 total	*2*	*8.5*
107	unknown		limestone	cordmarked	1	9.0
107	surface		limestone	plain	1	4.8
			limestone	cordmarked	3	24.1
			limestone	eroded	6	10.2
107	W1/2		limestone	plain	38	150.3
			limestone	cordmarked	55	325.5
			limestone	plain & cordmarked	1	27.5
			limestone	red slipped	5	6.6
			limestone	eroded	11	21.9
			grit	plain	2	24.5
			grog	plain	3	7.4
			grog	smoothed cordmarked	1	2.4
			grog	plain/cordmarked	1	21.8
107	E1/2	unknown	limestone	plain	19	46.7
			limestone	cordmarked	91	594.9
			limestone	red slipped	5	18.2
			limestone	eroded	21	63.2
			grit	plain	1	1.4
			grit	cordmarked	1	9.3
			limestone & grit	plain	1	3.4
			grog	cordmarked	2	14.1
107	E1/2		limestone	cordmarked	1	13.6
			grog	plain	1	3.1
107	PM 38		limestone	cordmarked	1	27.5
				Feature 107 total	*272*	*1431.4*
108	W1/2		grog	cordmarked	17	66.3
108	E1/2		grog	cordmarked	51	290.4
				Feature 108 total	*68*	*356.7*
109	W1/2		limestone	plain	3	5.1
			limestone	cordmarked	16	194.7
			limestone	eroded	7	13.0
			grog	cordmarked	3	10.7
109	E1/2		limestone	plain	1	2.2
109	E1/2		limestone	cordmarked	18	95.5
			limestone	eroded	3	3.4
			grog	cordmarked	1	1.1
				Feature 109 total	*23*	*102.2*
110	E1/2	A1	limestone	cordmarked	8	60.1
			limestone	eroded	8	18.1
			grog	cordmarked	1	1.9
110	E1/2	A2	limestone	plain	4	29.2
			limestone	cordmarked	25	110.6
110	E1/2	A2	limestone	eroded	2	3.1

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
110	E1/2	A2	grog	cordmarked	8	45.3
			grog	plain	1	3.3
			grit	cordmarked	2	7.0
110	E1/2	A3	limestone	cordmarked	1	2.8
			limestone	eroded	1	3.7
110	W1/2		limestone	plain	8	23.5
			limestone	cordmarked	58	243.3
			limestone	eroded	6	11.6
			grit	plain	1	3.8
			grog	cordmarked	23	66.5
			grog	plain	1	2.1
			limestone & grit	cordmarked	1	12.0
				Feature 110 total	*159*	*647.9*
111	N1/2		grog	cordmarked	3	62.4
111	S1/2		grog	cordmarked	2	24.5
				Feature 111 total	*5*	*86.9*
115	N1/2		grit	cordmarked	4	27.2
			grog		1	3.0
			grog	plain	2	7.1
115	S1/2		grit	cordmarked	1	2.9
				Feature 115 total	*8*	*40.2*
118	E1/2		grog	smoothed cordmarked	1	5.3
				Feature 118 total	*1*	*5.3*
119	E1/2		limestone	plain	21	152.4
			limestone	cordmarked	28	167.4
			limestone	smoothed cordmarked	3	22.9
119	E1/2		limestone	eroded	5	24.6
119	W1/2		limestone	plain	10	83.1
			limestone	cordmarked	44	399.2
			limestone	plain & cordmarked	3	23.1
			limestone	smoothed cordmarked	13	95.6
			limestone	eroded	3	6.7
			grit	cordmarked	4	11.4
			grog	cordmarked	1	6.8
120	E1/2		limestone	cordmarked	3	7.0
	E1/2		limestone	smoothed cordmarked	6	61.2
120	E1/2		limestone	eroded	1	1.4
			grit	cordmarked	4	30.7
120	W1/2		limestone	plain	1	12.5
			limestone	cordmarked	6	106.8
			limestone	smoothed cordmarked	1	3.7
			grit	cordmarked	3	8.3
				Feature 120 total	*25*	*231.6*
122	N1/2		limestone	plain	1	1.3
			limestone	cordmarked	1	1.9
			limestone	red slipped interior	1	0.9
			limestone	red slipped exterior	1	2.2
			grog	cordmarked	1	6.7

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
122	S1/2	A	limestone	red slipped	1	3.9
			limestone	eroded	1	2.4
122	S1/2	D	limestone	plain	1	0.9
			limestone	cordmarked	3	167.2
			limestone	plain & cordmarked	1	6.6
				Feature 122 total	*12*	*194.0*
123	S1/2		limestone	plain	1	1.1
123	N1/2		limestone	cordmarked	1	0.2
				Feature 123 total	*2*	*1.3*
124	N1/2		limestone	cordmarked	12	76.0
			limestone	smoothed cordmarked	3	40.0
			limestone	eroded	5	9.8
			grog	cordmarked	1	9.5
			grog	smoothed cordmarked	1	4.3
			limestone & grit	cordmarked	1	3.3
124	S1/2		limestone	plain	6	13.4
			limestone	cordmarked	8	31.4
			limestone	eroded	3	6.9
				Feature 123 total	*40*	*194.6*
125	N1/2		limestone	cordmarked	49	339.5
			limestone	smoothed cordmarked	3	31.7
			limestone	eroded	7	14.3
			limestone	smoothed cordmarked/red slipped	5	22.7
			limestone	plain/int. & ext. red slipped	1	6.5
			grog	plain	5	14.6
125	N1/2		grog	smoothed cordmarked	1	1.8
			shell	smoothed cordmarked	2	48.2
125	S1/2		limestone	plain	6	21.3
			limestone	cordmarked	38	185.7
			limestone	plain & cordmarked	1	1.1
			limestone	smoothed cordmarked	2	5.8
			limestone	eroded	6	15.5
			shell	smoothed cordmarked	2	29.1
			grog	plain	1	1.3
			limestone & grog	cordmarked	1	3.1
			limestone & grit	smoothed cordmarked	3	24.3
				Feature 125 total	*84*	*766.5*
126	E1/2	A	limestone	cordmarked	13	77.4
126	W1/2		limestone	cordmarked	4	17.8
			limestone	eroded	1	2.3
126	E1/2	B	limestone	plain	2	20.9
			limestone	cordmarked	3	9.2
				Feature 126 total	*23*	*127.6*
127	N1/2		limestone	plain	1	2.9
			limestone	cordmarked	37	231.6
			limestone	smoothed cordmarked	14	71.0
			limestone	eroded	1	1.3
			grit	plain	2	11.4

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
127	N1/2		grit	cordmarked	2	7.0
			grit	smoothed cordmarked	1	2.8
127	S1/2		limestone	plain	8	42.0
			limestone	cordmarked	28	136.8
			limestone	smoothed cordmarked	45	147.9
			grit	cordmarked	1	2.4
			grit	smoothed cordmarked	3	10.8
				Feature 127 total	*143*	*667.9*
128	E1/2		limestone	plain	4	25.7
			limestone	cordmarked	30	216.6
			limestone	plain & cordmarked	2	15.7
			limestone	smoothed cordmarked	3	15.0
			limestone	red slipped	1	7.6
			limestone	eroded	4	22.6
128	W1/2	A	limestone	plain	3	14.4
			limestone	cordmarked	13	102.7
			limestone	eroded	2	7.9
			grog	cordmarked	1	10.5
128	W1/2	B	limestone	cordmarked	2	23.5
			limestone	red slipped	1	1.7
			limestone	eroded	1	8.7
			grog	plain/red slipped	1	2.5
				Feature 128 total	*68*	*475.1*
129	S1/2		limestone	plain	3	17.9
129	S1/2		limestone	cordmarked	22	222.7
			limestone	smoothed cordmarked	4	45.3
			grog	cordmarked	1	4.2
			limestone & shell	plain	1	3.6
			limestone & grit	plain	1	3.2
129	N1/2		limestone	cordmarked	1	1.2
			grog	smoothed cordmarked	1	2.6
				Feature 129 total	*34*	*300.7*
130	W1/2		limestone	cordmarked	1	3.9
			grog	plain	1	3.1
				Feature 130 total	*2*	*7.0*
131	N1/2		limestone	cordmarked	3	26.4
			grog	smoothed cordmarked	1	19.0
131	S1/2		limestone	cordmarked	5	37.2
				Feature 131 total	*9*	*82.6*
132	E1/2	A	limestone	cordmarked	10	167.0
132	E1/2	B	limestone	cordmarked	4	25.2
			grit	cordmarked	1	1.8
132	E1/2	C	limestone	cordmarked	1	7.7
			grit	plain	1	7.2
132	E1/2	D	limestone	cordmarked	2	19.5
				Feature 132 total	*19*	*228.4*
133	S1/2		grit	plain	1	6.1
				Feature 133 total	*1*	*6.1*

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
134	S1/2		grog	cordmarked	2	2.9
134	N1/2		grog	cordmarked	6	72.1
			grog	incised	2	4.2
				Feature 134 total	*10*	*79.2*
135	N1/2		limestone	plain	3	4.4
			limestone	cordmarked	29	96.4
			limestone	eroded	10	14.5
			limestone & grog	cordmarked	2	3.8
			grit	plain	1	11.0
			grit	eroded	3	7.1
			grog	plain	5	8.3
			grog	cordmarked	5	16.9
			grog	eroded	2	2.7
135	S1/2	D	limestone	plain	8	12.6
			limestone	cordmarked	22	100.3
			limestone	eroded	13	44.4
			grit	plain	1	3.7
			grit/MCS	plain	11	111.5
			grit	cordmarked	1	1.9
			grit/MCS	cordmarked	3	439.3
			grit/MCS	plain & cordmarked	1	10.2
			grog	plain	1	2.3
			grog	cordmarked	2	7.1
135	S1/2	D	no temper	plain	2	6.5
				Feature 135 total	*125*	*904.9*
137	E1/2		limestone	plain	6	35.8
			limestone	cordmarked	37	398.5
			limestone	plain & cordmarked	1	7.3
			limestone	smoothed cordmarked	1	20.6
			limestone	eroded	1	17.8
			grit	plain	2	10.8
			grog	cordmarked	8	41.8
			grog	eroded	1	1.9
			grog	smoothed cordmarked	1	6.6
137	W1/2		limestone	plain	1	2.1
			limestone	cordmarked	7	37.1
137	W1/2	1-2	limestone	cordmarked	5	15.7
			limestone	smoothed cordmarked	4	12.3
			grog	eroded	1	3.7
137	W1/2	3-4-5	limestone	plain	3	16.1
			limestone	cordmarked	4	69.4
			limestone	plain & cordmarked	1	5.4
			grit	cordmarked	1	8.5
137	W1/2	B7	limestone	cordmarked	2	16.1
			grog	plain	1	5.5
			grog	cordmarked	2	14.3
137	W1/2	8	limestone	cordmarked	2	18.7
				Feature 137 total	*92*	*766.0*

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
138	W1/2		limestone	cordmarked	10	64.9
			limestone	smoothed cordmarked	3	5.5
138	E1/2	A	limestone	plain	1	4.4
			limestone	cordmarked	11	53.4
			limestone	red slipped	1	6.3
138	E1/2	B	limestone	plain	4	32.2
			limestone	cordmarked	4	16.7
			limestone	plain & cordmarked	1	9.8
			limestone	smoothed cordmarked	1	8.2
			grog	plain	1	11.5
138	E1/2	D	limestone	cordmarked	2	17.6
				Feature 138 total	*39*	*230.5*
139	E1/2		limestone	plain	1	5.9
			limestone	cordmarked	9	36.1
			grit/MCS	plain	3	17.7
			grit	cordmarked	1	3.0
			grit/MCS	cordmarked	3	31.4
			grog	cordmarked	6	17.5
139	W1/2		limestone	cordmarked	2	10.5
			grit/MCS	plain	1	4.6
			grog	cordmarked	1	4.4
				Feature 139 total	*27*	*131.1*
140	S1/2		grog	cordmarked	1	4.3
				Feature 140 total	*1*	*4.3*
141	E1/2		limestone	plain	7	29.2
			limestone	cordmarked	53	380.3
			limestone	plain & cordmarked	2	7.1
			limestone	smoothed cordmarked	6	33.5
			limestone	eroded	3	11.0
			grog	smoothed cordmarked	1	2.7
			grog	cordmarked	10	58.8
141	W1/2		limestone	plain	2	7.0
			limestone	cordmarked	31	323.9
			limestone	eroded	2	5.4
			grit	plain	1	3.5
			grog	cordmarked	5	26.3
			grog	plain	2	7.6
				Feature 141 total	*125*	*896.3*
142	W1/2		limestone	plain	13	35.7
			limestone	cordmarked	67	392.4
			limestone	smoothed cordmarked	7	40.3
			limestone	red slipped	3	16.0
			limestone	eroded	1	1.3
			limestone & grog	cordmarked	1	20.6
			grog	cordmarked	13	70.5
			grog	plain	1	1.3
142	E1/2	A	limestone	cordmarked	16	155.6
			limestone	smoothed cordmarked	4	205.8

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
142	E1/2	A	limestone	eroded	1	1.9
			grog	plain	1	1.8
142	E1/2	B	limestone	plain	8	40.7
			limestone	cordmarked	40	274.4
			limestone	plain & cordmarked	1	7.9
			limestone	smoothed cordmarked	1	4.9
			limestone	red slipped	32	78.8
			limestone	eroded	1	1.1
			grog	plain	1	2.2
			grit	incised	1	3.3
142	E1/2	B/C	limestone	cordmarked	4	52.1
142	E1/2	C	limestone	plain	16	64.8
			limestone	cordmarked	76	456.4
			limestone	plain & cordmarked	5	52.4
			limestone	smoothed cordmarked	2	28.4
			limestone	red slipped	7	29.0
			limestone	eroded	5	14.1
			grog	plain	1	3.2
			grog	cordmarked	2	4.1
				Feature 142 total	*31*	*2061.0*
143	S1/2		grog	cordmarked	1	7.0
				Feature 143 total	*1*	*7.0*
144	N1/2	A	limestone	cordmarked	8	24.3
			limestone	plain & cordmarked	1	1.2
			limestone	eroded	2	6.1
			shell	plain	1	18.2
			limestone & grog	cordmarked	1	71.3
144	N1/2	B	grog	cordmarked	3	23.2
144	S1/2		limestone	plain	1	3.4
			limestone	cordmarked	7	43.7
			limestone	smoothed cordmarked	1	2.1
			limestone	eroded	2	15.5
			grog	plain	1	7.9
			grog	smoothed cordmarked	1	2.0
			grog	eroded	1	1.5
				Feature 144 total	*30*	*220.4*
146	SW1/2		grog	cordmarked	6	55.2
				Feature 146 total	*6*	*55.2*
147	E1/2		limestone	cordmarked	1	3.9
			limestone	smoothed cordmarked	1	7.0
			grit	plain	1	5.8
147	W1/2		limestone	plain	4	10.7
			limestone	cordmarked	3	24.0
			grit	cordmarked	2	9.7
			grog	cordmarked	2	5.8
				Feature 147 total	*14*	*66.9*
148	E1/2		limestone	cordmarked	1	2.6
			limestone	plain & cordmarked	1	14.1

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
148	E1/2			*Feature 148 total*	*2*	*16.7*
149	N1/2	B	limestone	cordmarked	1	5.0
				Feature 149 total	*1*	*5.0*
150	W1/2		limestone	cordmarked	6	32.9
			limestone	plain & cordmarked	1	7.7
			grit	cordmarked	1	7.0
			grog	cordmarked	1	5.6
150	E1/2		limestone	plain	6	44.0
			limestone	cordmarked	8	158.6
			limestone	plain & cordmarked	1	16.4
			limestone	smoothed cordmarked	1	16.9
			grog	cordmarked	1	3.1
				Feature 150 total	*26*	*292.2*
151	N1/2	A	grog	plain	1	2.5
			grog	cordmarked	1	1.8
				Feature 151 total	*2*	*4.3*
153	W1/2		limestone	cordmarked	1	2.2
			limestone	smoothed cordmarked	1	6.5
				Feature 153 total	*2*	*8.7*
154	N1/2	A & B	limestone	plain	6	18.0
			limestone	cordmarked	120	1679.7
			limestone	plain & cordmarked	1	19.4
			limestone	red slipped	7	47.3
			shell	plain	3	26.7
			shell & grit	cordmarked	1	32.7
154	N1/2	C	limestone	cordmarked	6	51.9
			shell	plain	1	11.8
			shell	cordmarked	1	27.8
154	S1/2		limestone	plain	14	63.9
			limestone	cordmarked	23	127.7
			limestone	plain & cordmarked	1	13.1
			limestone	red slipped	6	48.5
			limestone	eroded	6	55.9
			shell	plain	1	6.2
			shell	cordmarked	1	8.2
			grog	plain	3	17.8
155	NE1/2	A	limestone	plain	8	38.1
			limestone	cordmarked	26	316.1
			limestone	plain & cordmarked	2	59.5
			limestone	smoothed cordmarked	2	18.7
			limestone	eroded	1	1.5
			limestone & shell	red slipped	1	5.8
			limestone & shell	plain	2	11.4
155	S1/2		limestone	plain	7	27.2
			limestone	cordmarked	9	54.8
			limestone	smoothed cordmarked	1	10.2
			limestone	red slipped	3	25.1

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
155	S1/2		limestone	eroded	2	10.2
				Feature 154 total	*265*	*2835.2*
156	E1/2		limestone	cordmarked	1	2.7
156	W1/2		limestone	cordmarked	1	1.5
				Feature 156 total	*2*	*4.2*
159	N1/2		limestone	plain	15	74.1
			limestone	cordmarked	17	86.8
			limestone	red slipped	2	4.4
			limestone	eroded	4	8.4
			limestone & shell	plain/cordmarked	1	95.7
			limestone & shell	eroded	1	1.6
			grog	plain	2	4.2
			grog	plain/cordmarked	1	10.5
			grog	smoothed cordmarked	7	19.2
			grog	cordmarked	14	108.8
			shell	plain	1	2.8
159	burned areas		limestone	cordmarked	2	7.0
			grog	plain	3	11.6
			grog	smoothed cordmarked	7	35.2
159	burned areas		limestone & grit	cordmarked	11	40.8
159	S1/2		limestone	plain	4	15.2
			limestone	cordmarked	11	171.4
			limestone	red slipped	6	18.7
			limestone	eroded	9	16.9
			limestone & grog	cordmarked	2	8.3
			limestone & grog	eroded	4	17.3
			grog	smoothed cordmarked	38	231.8
			grog	cordmarked	26	141.0
			grog	plain	26	173.3
			grog	plain/cordmarked	4	44.7
			shell	plain	2	1.8
			shell	eroded	1	1.6
				Feature 159 total	*221*	*1353.1*
160	N1/2		limestone	cordmarked	1	6.7
			grog	cordmarked	6	30.0
160	S1/2		limestone	cordmarked	1	12.7
			grog	cordmarked	5	26.7
				Feature 160 total	*13*	*76.1*
161	E1/2		grog	cordmarked	1	8.6
161	W1/2		grog	cordmarked	2	9.0
				Feature 161 total	*3*	*17.6*
162	E1/2		grit	cordmarked	1	2.1
				Feature 162 total	*1*	*2.1*
163	W1/2		grog	cordmarked	1	2.5
163	E1/2		grog	cordmarked	1	2.7
				Feature 163 total	*2*	*5.2*
164	N1/2		limestone	cordmarked	4	16.6
			limestone	plain & cordmarked	1	6.6

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
164	N1/2		limestone	red slipped	2	6.4
			grog	incised	1	3.8
164	S1/2		limestone	cordmarked	3	11.6
			limestone	red slipped	4	11.0
164	S1/2		limestone	cordmarked	1	7.5
			limestone	smoothed cordmarked	1	3.5
				Feature 164 total	*17*	*67.0*
165	N1/2		limestone	plain	4	19.7
			limestone	cordmarked	42	482.2
			limestone	plain & cordmarked	1	13.7
			limestone	smoothed cordmarked	3	26.3
			limestone	eroded	3	3.8
			grog	cordmarked	4	48.6
165	S1/2		limestone	plain	12	37.4
			limestone	cordmarked	131	867.2
			limestone	plain & cordmarked	3	22.0
			limestone	smoothed cordmarked	19	120.4
			limestone	red slipped	10	24.5
165	S1/2		limestone	eroded	12	38.6
			grog	smoothed cordmarked	14	129.4
			grog	cordmarked	4	28.9
			grit	cordmarked	2	10.6
				Feature 165 total	*264*	*1873.3*
166	W1/2		limestone	cordmarked	3	3.9
166	E1/2		limestone	cordmarked	2	5.1
			grog	smoothed cordmarked	1	2.0
				Feature 166 total	*6*	*11.0*
167	E1/2		limestone	cordmarked	1	12.5
167	W1/2		limestone	plain	4	8.6
			limestone	cordmarked	4	13.8
				Feature 167 total	*9*	*34.9*
168	E1/2		limestone	plain	1	4.5
			limestone & grog	cordmarked	1	4.5
			limestone & grog	plain	1	1.1
168	W1/2		grog	plain	1	1.8
				Feature 168 total	*4*	*11.9*
169	W1/2		grog	cordmarked	1	12.5
				Feature 169 total	*1*	*12.5*
170	E1/2		grog	cordmarked	7	62.9
			grog	eroded	2	7.7
			grog	smoothed cordmarked	2	5.0
170	W1/2		grog	cordmarked	8	101.9
170	W1/2	A	grog	cordmarked	3	28.2
				Feature 170 total	*22*	*205.7*
171	E1/2		limestone	cordmarked	1	13.4
171	W1/2		limestone	cordmarked	2	15.6
				Feature 171 total	*3*	*29.0*
172	E1/2		grog	cordmarked	3	19.0

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
172	E1/2		grog	eroded	1	2.1
172	W1/2		grog	cordmarked	3	53.1
			grog	plain	1	1.6
				Feature 172 total	*8*	*75.8*
173	E1/2		limestone	cordmarked	1	4.8
			grog	smoothed cordmarked	1	11.8
				Feature 173 total	*2*	*16.6*
174	E1/2		grog	plain	1	5.9
				Feature 174 total	*1*	*5.9*
175	E1/2		limestone	cordmarked	2	24.8
			limestone	smoothed cordmarked	2	82.8
			limestone	eroded	1	4.2
				Feature 175 total	*5*	*111.8*
177	E1/2		limestone	cordmarked	19	107.5
			limestone	smoothed cordmarked	2	4.3
			grog	plain	1	3.9
			grog	cordmarked	1	2.7
177	W1/2		limestone	cordmarked	15	273.6
			limestone	smoothed cordmarked	10	147.4
			limestone	eroded	1	7.8
			grog	cordmarked	2	10.3
				Feature 177 total	*51*	*557.5*
178	N1/2		limestone	plain	39	228.3
			limestone	cordmarked	45	211.8
			limestone	smoothed cordmarked	3	34.2
			limestone	eroded	3	16.7
			grog	cordmarked	1	8.1
178	S1/2		limestone	plain	5	38.5
			limestone	cordmarked	32	244.1
			limestone	smoothed cordmarked	3	21.2
			grog	cordmarked	1	4.6
			grog	plain	2	4.6
				Feature 178 total	*134*	*812.1*
179	E1/2		limestone	cordmarked	17	87.4
			limestone	plain & cordmarked	1	3.8
			limestone	smoothed cordmarked	9	88.4
			limestone	eroded	1	3.4
			grog	eroded	2	6.3
			grog	smoothed cordmarked	3	22.1
			grog	cordmarked	1	2.9
179	W1/2	A1	limestone	cordmarked	9	67.6
			limestone	smoothed cordmarked	4	34.4
			limestone	eroded	1	4.6
			grog	cordmarked	5	27.0
			grog	eroded	1	5.0
179	W1/2	A2	limestone	plain	4	62.6
			limestone	cordmarked	26	135.9
			limestone	eroded	2	4.3

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
179	W1/2	A2	grog	cordmarked	2	10.2
				Feature 179 total	*88*	*565.9*
180	S1/2		limestone	plain	7	14.7
			limestone	cordmarked	35	151.9
			limestone	smoothed cordmarked	4	20.0
			limestone	eroded	11	20.8
			grog	smoothed cordmarked	1	1.4
180	N1/2		limestone	plain	16	47.8
			limestone	cordmarked	8	59.9
			limestone	smoothed cordmarked	18	143.7
			limestone	eroded	3	8.7
				Feature 180 total	*103*	*468.9*
181	S1/2		limestone	eroded	4	6.5
				Feature 181 total	*4*	*6.5*
182	N1/2		limestone	plain	2	7.5
			limestone	cordmarked	8	19.5
182	N1/2		grog	cordmarked	4	52.6
			grog	plain	3	15.3
			shell	plain	1	1.3
182	S1/2		limestone	plain	16	57.1
			limestone	cordmarked	27	83.4
			limestone	smoothed cordmarked	9	71.0
			limestone	eroded	9	13.4
			grog	cordmarked	4	7.3
			shell	plain	1	1.1
				Feature 182 total	*84*	*329.5*
190	S1/2		limestone	smoothed cordmarked	1	8.5
				Feature 190 total	*1*	*8.5*
200			limestone	eroded	1	2.2
				Feature 200 total	*1*	*2.2*
201	SW1/2		grog	eroded	1	4.8
				Feature 201 total	*1*	*4.8*
206	E1/2	A	limestone	plain	1	2.0
			limestone	cordmarked	8	88.8
			limestone	eroded	4	14.7
			grog	cordmarked	2	10.2
206	W1/2		limestone	plain	1	10.9
			limestone	cordmarked	6	25.2
			limestone	eroded	1	12.2
				Feature 206 total	*23*	*164.0*
208	E1/2		grog	eroded	1	1.9
208	W1/2	A	grog	eroded	1	0.8
				Feature 208 total	*2*	*2.7*
209	N1/2		grog	smoothed cordmarked	1	2.6
			grog	cordmarked	5	27.6
				Feature 209 total	*6*	*30.2*
210	S1/2		limestone	plain	3	6.5
			limestone	cordmarked	8	17.0

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
210	S1/2		limestone	smoothed cordmarked	5	20.9
			limestone	eroded	4	32.4
			grog	eroded	1	1.1
			grog	cordmarked	3	6.3
			grog	smoothed cordmarked	2	17.5
			grit	plain	1	3.6
210	N1/2	A1	limestone	plain	10	28.4
			limestone	cordmarked	21	93.7
			limestone	smoothed cordmarked	6	31.7
			limestone	red slipped	1	6.0
			limestone	eroded	6	16.1
			limestone & grog	plain	1	12.1
			grog	plain	3	10.7
			grog	cordmarked	2	6.6
			grog	eroded	1	4.5
210	N1/2	A	limestone	plain	1	3.5
			limestone	cordmarked	1	6.2
			limestone	smoothed cordmarked	2	16.2
			limestone	eroded	6	21.5
				Feature 210 total	*88*	*362.5*
216			limestone	cordmarked	2	8.8
			limestone & grog	cordmarked	5	45.4
				Feature 216 total	*7*	*54.2*
221	cleaning		limestone	plain	2	2.1
			limestone	cordmarked	3	17.6
221	E1/2		limestone	plain	27	105.6
			limestone	cordmarked	174	807.9
			limestone	plain & cordmarked	8	110.9
			limestone	smoothed cordmarked	33	153.7
			limestone	red slipped	2	26.6
			limestone	eroded	10	41.9
			grog	red slipped	1	11.2
			grog	smoothed cordmarked	2	19.5
			shell	eroded	1	5.7
221	W1/2		limestone	plain	27	159.3
			limestone	cordmarked	188	1109.5
			limestone	plain & cordmarked	6	118.6
			limestone	smoothed cordmarked	34	199.6
			limestone	red slipped	6	44.0
			limestone	eroded	6	17.3
			grog	cordmarked	5	38.2
			grog	red slipped	3	13.4
221	W1/2		limestone	plain	1	4.1
			limestone	cordmarked	2	12.4
			grog	cordmarked	1	2.9
			grog	plain	1	2.0
221	E1/2		limestone	cordmarked	4	11.8
			grog	cordmarked	1	1.4

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
221	E1/2		grog	eroded	1	1.4
221	W1/2	A	limestone	cordmarked	28	292.3
			limestone	eroded	3	14.0
			grog	stick marked	1	51.8
				Feature 221 total	*581*	*3396.7*
222	E1/2		limestone	plain	2	4.1
			limestone	cordmarked	56	360.2
			limestone	smoothed cordmarked	1	5.6
			limestone	red slipped	1	22.0
			limestone	eroded	1	2.0
			grit	cordmarked	3	32.1
			grog	cordmarked	4	16.6
			grog	smoothed cordmarked	4	13.4
222	W1/2		limestone	plain	3	17.3
222	W1/2		limestone	cordmarked	29	224.6
			limestone	eroded	1	1.5
			grog	plain	1	15.0
			grog	eroded	1	3.4
			grog	cordmarked	6	38.0
			grog	plain/cordmarked	1	3.4
				Feature 222 total	*42*	*303.2*
223	E1/2		limestone	plain	6	71.4
			limestone	cordmarked	6	21.2
			limestone	smoothed cordmarked	1	3.7
			limestone	red slipped	4	14.6
			limestone	eroded	1	7.6
			shell	plain	1	2.9
			shell	cordmarked	8	65.9
			grog	plain	1	4.6
223	W1/2	A	limestone	cordmarked	5	32.1
223	W1/2	B	limestone	plain	2	11.0
			limestone	cordmarked	22	102.6
			limestone	smoothed cordmarked	1	2.8
			limestone	red slipped	3	17.1
			limestone	eroded	1	2.8
			shell	plain	1	1.1
			shell	cordmarked	7	22.7
				Feature 223 total	*70*	*384.1*
224	E1/2		limestone	plain	2	9.2
			limestone	cordmarked	27	188.8
			limestone	smoothed cordmarked	2	11.5
			grit	cordmarked	1	2.6
			shell	plain	2	6.1
			shell	cordmarked	5	19.5
			shell	plain & cordmarked	2	18.7
			grog	plain	1	4.4
			grog	cordmarked	7	27.1
224	W1/2	A	limestone	cordmarked	12	52.0

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
224	W1/2	A	grog	plain	2	7.4
			grog	cordmarked	1	9.0
224	W1/2	B	limestone	plain	1	7.9
			limestone	cordmarked	3	11.2
			limestone	smoothed cordmarked	1	4.1
			limestone	eroded	3	7.5
			shell	cordmarked	7	35.6
			grog	cordmarked	1	3.1
			grog	smoothed cordmarked	2	6.4
				Feature 224 total	*82*	*432.1*
225	E1/2		limestone	cordmarked	3	22.1
				Feature 225 total	*3*	*22.1*
226	E1/2		limestone	plain	1	12.5
226	E1/2		limestone	cordmarked	1	14.2
			limestone	red slipped	1	12.7
226	W1/2		limestone	cordmarked	7	52.7
			limestone & shell	plain	2	9.1
			shell	smoothed cordmarked	4	47.9
			shell	plain	2	4.8
			shell	cordmarked	1	273.6
			shell	eroded	1	1.7
			grog & shell	plain	1	6.3
				Feature 226 total	*21*	*435.5*
228	W1/2	A1,A2	limestone	cordmarked	4	11.5
228	W1/2	B1,B2	limestone	plain	2	7.0
			limestone	cordmarked	54	454.1
			limestone	red slipped	3	18.5
			limestone	eroded	2	24.7
			limestone	smoothed cordmarked/red slipped	5	30.5
			grog	plain	1	6.6
228	W1/2	C	limestone	plain	3	6.1
			limestone	cordmarked	38	346.2
			limestone	red slipped	1	72.3
			limestone	eroded	1	1.4
228	W1/2	ash lens	limestone	cordmarked	1	2.5
				Feature 228 total	*115*	*981.4*
229	E1/2		limestone	plain	19	125.6
			limestone	cordmarked	275	2775.6
			limestone	smoothed cordmarked	10	178.5
			limestone	eroded	12	42.7
			grit	cordmarked	1	13.0
			grog	cordmarked	10	55.0
229	W1/2	profile 4	limestone	cordmarked	26	506.0
230	E1/2	A	limestone	plain	6	34.9
			grog	smoothed cordmarked	1	3.7
			grog	eroded	1	2.9
			grog	cordmarked	3	19.5
			grit	cordmarked	2	8.6

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
230	E1/2	B	limestone	cordmarked	8	59.2
			limestone	smoothed cordmarked	4	32.8
			limestone	eroded	3	6.8
230	W1/2		limestone	plain	3	11.7
			limestone	cordmarked	5	23.5
			limestone	smoothed cordmarked	4	63.4
			limestone	eroded	2	4.0
			grog	cordmarked	3	24.6
			grog	smoothed cordmarked	5	21.8
			grog	eroded	1	2.4
				Feature 230 total	*404*	*4016.2*
231	W1/2		grog	plain	1	4.4
				Feature 231 total	*1*	*4.4*
232	E1/2		limestone	cordmarked	4	38.3
			grit	cordmarked	5	69.5
			grog	cordmarked	4	26.4
232	W1/2		limestone	cordmarked	1	6.9
			grit	cordmarked	5	43.2
				Feature 232 total	*19*	*184.3*
233	E1/2		limestone	plain	5	15.9
			limestone	cordmarked	25	296.5
			limestone	red slipped	1	9.5
			grit	cordmarked	7	71.2
			grog	cordmarked	4	19.1
233	W1/2		limestone	plain	3	13.9
			limestone	cordmarked	31	533.5
			limestone	eroded	1	3.9
			grog	cordmarked	5	29.8
				Feature 233 total	*82*	*993.3*
234	E1/2		limestone	cordmarked	1	1.7
			limestone	eroded	1	1.6
			shell	plain	2	2.3
				Feature 234 total	*4*	*5.6*
235	W1/2	A2	shell	plain	2	3.4
235	E1/2		limestone	plain	3	11.0
			limestone	cordmarked	2	4.7
			limestone	smoothed cordmarked	1	2.9
			limestone	eroded	1	3.5
			shell	plain	1	2.2
			shell	eroded	1	1.2
235	W1/2	B2	limestone	cordmarked	1	1.7
			limestone	eroded	4	5.2
			grog	eroded	1	1.5
			grog	cordmarked	1	6.6
235	W1/2	B1	limestone	cordmarked	1	1.9
			limestone	smoothed cordmarked	1	2.2
			limestone	eroded	1	2.3

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
235	W1/2	B1	shell	eroded	1	0.7
				Feature 235 total	*22*	*51.0*
236	NE1/4		limestone	cordmarked	1	8.1
			limestone	eroded	1	3.6
			grog	cordmarked	3	14.8
236	E1/2		limestone	plain	9	41.1
			limestone	cordmarked	95	893.0
			limestone	plain & cordmarked	1	17.5
			limestone	smoothed cordmarked	4	67.6
			shell & grog	cordmarked	17	107.1
			grog	cordmarked	6	50.0
236	W1/2		limestone	eroded	1	1.5
236	W1/2	1B	limestone	cordmarked	5	46.0
236	W1/2	1C	limestone	plain	2	7.3
			limestone	cordmarked	6	58.9
			grog	cordmarked	3	8.5
236	W1/2	2	limestone	plain	1	4.5
			limestone	cordmarked	6	36.6
			grit/MCS	plain	1	10.8
			grog	cordmarked	5	71.0
236	W1/2	3	limestone	plain	1	15.5
			limestone	cordmarked	18	198.7
			grog	cordmarked	1	34.7
236	W1/2	unknown	limestone	cordmarked	2	106.9
				Feature 236 total	*189*	*1803.7*
241			limestone	cordmarked	1	10.6
			grog	plain	3	22.7
				Feature 241 total	*4*	*33.3*
243			limestone	plain	4	18.4
			limestone	eroded	1	12.1
				Feature 243 total	*5*	*30.5*
244			limestone	cordmarked	1	10.1
				Feature 244 total	*1*	*10.1*
253			limestone	smoothed cordmarked	13	455.1
			limestone	eroded	2	2.3
				Feature 253 total	*15*	*457.4*
254	E1/2		grog	smoothed cordmarked	1	3.9
				Feature 254 total	*1*	*3.9*
255	W1/2		limestone	plain	5	17.9
			limestone	cordmarked	33	182.7
			limestone	smoothed cordmarked	7	33.9
			limestone	eroded	2	2.0
			limestone & grog	cordmarked	1	6.1
			grog	cordmarked	9	27.5
255	E1/2		limestone	plain	12	28.2
			limestone	cordmarked	31	205.1
			limestone	smoothed cordmarked	2	9.5
			limestone	red slipped	2	23.1

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
255	E1/2		limestone	eroded	2	2.3
			grog	cordmarked	2	7.5
				Feature 255 total	*108*	*545.8*
256	N1/2		limestone	cordmarked	10	24.6
			limestone	red slipped	1	7.1
			grog	cordmarked	3	15.7
			grog	plain	1	1.3
256	S1/2		limestone	plain	6	18.1
			limestone	cordmarked	15	146.5
			limestone	plain & cordmarked	2	8.5
256	S1/2		limestone	eroded	3	4.9
			grog	smoothed cordmarked	3	8.6
			grit	cordmarked	1	1.9
				Feature 256 total	*38*	*221.8*
258	W1/2		limestone	cordmarked	2	4.9
			grog	eroded	2	2.5
			shell	eroded	2	3.9
258	E1/2		limestone	plain	2	11.4
			limestone	cordmarked	4	7.5
			limestone	smoothed cordmarked	1	7.8
			limestone	eroded	2	2.6
			grog	eroded	1	0.8
			shell	eroded	7	16.8
			shell	plain	20	63.4
			shell	incised/red slipped	1	2.8
			shell	incised	2	10.4
			shell	plain/red slipped	18	261.3
				Feature 258 total	*64*	*396.1*
259	S1/2	A	limestone	cordmarked	4	12.5
			limestone	smoothed cordmarked	1	1.7
			limestone	eroded	2	2.8
259	N1/2	A	limestone	plain	5	58.0
			limestone	smoothed cordmarked	16	80.3
				Feature 259 total	*28*	*155.3*
264	E1/2		limestone	cordmarked	24	180.6
			limestone	red slipped	4	12.7
			limestone	eroded	1	2.2
			grit	plain	1	20.2
			grog	cordmarked	2	9.3
264	W1/2	A	limestone	plain	1	4.4
			limestone	cordmarked	8	82.6
			limestone	red slipped	2	6.5
			grog	plain	1	4.8
264	W1/2	C	limestone	cordmarked	4	19.2
				Feature 264 total	*48*	*342.5*
265	N1/2	A	limestone	plain	1	2.3
			limestone	cordmarked	1	8.6

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Feature #	Provenience Portion	Zone	Temper	Surface Treatment Exterior/Interior	N	W(g)
265	N1/2	A	grit	cordmarked	1	5.6
				Feature 265 total	*3*	*16.5*
266	SW1/2		limestone	plain	6	35.2
			limestone	cordmarked	38	224.0
			limestone	smoothed cordmarked	5	70.8
			grog	plain	1	24.6
266	W1/2	F	limestone	cordmarked	6	14.2
			limestone	smoothed cordmarked	2	12.8
266	NE1/2	A	limestone	cordmarked	2	80.8
266	NE1/2	B	limestone	cordmarked	29	174.5
266	NE1/2	C	limestone	cordmarked	2	5.8
266	NE1/2	D	limestone	cordmarked	4	11.6
			limestone	eroded	1	1.2
266	NE1/2	E	limestone	plain	1	2.4
			limestone	cordmarked	4	34.9
			limestone	smoothed cordmarked	4	16.0
			limestone	eroded	1	1.9
266	E1/2	F	limestone	cordmarked	8	41.4
			grog	cordmarked	3	17.4
				Feature 266 total	*117*	*769.5*
267	E1/2		limestone	plain	2	8.5
			limestone	plain	1	2.2
267	W1/2		limestone	cordmarked	3	13.1
				Feature 267 total	*6*	*23.8*
269	E1/2		grit & grog	cordmarked	9	91.7
			grog	plain	2	6.8
			grog	cordmarked	49	277.0
			grog	eroded	3	7.9
269	W1/2	A	grog	plain	4	26.9
			grog	cordmarked	32	222.0
				Feature 269 total	*99*	*632.2*
270	N1/2		limestone	cordmarked	17	354.3
			limestone	eroded	3	8.1
270	S1/2		limestone	cordmarked	1	6.1
				Feature 270 total	*21*	*368.5*

Test Units

Test Unit	Provenience Portion	Level	Temper	Surface Treatment Exterior/Interior	N	W(g)
1		0-11cm	limestone	cordmarked	4	20.8
			limestone	eroded	1	2.3
			grog	eroded	1	2.5
1		21-30cm	limestone	smoothed cordmarked	1	2.4
			grog	eroded	1	1.5
				Test Unit 1 total	*8*	*29.5*
Surface sinkhole			limestone	smoothed cordmarked	1	5.0
				Surface Sinkhole total	*1*	*5.0*

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Excavation Blocks

Provenience				Surface Treatment		
Block	Portion	Level	Temper	Exterior/Interior	N	W(g)
Central machine block in sinkhole			limestone	eroded	1	6.3
				Machine Block total	*1*	*6.3*
Excavation block 1			limestone	cordmarked	12	5.8
			limestone	eroded	1	2.1
			grog	smoothed cordmarked	6	33.3
			red ware(historic)	interior glaze	2	6.3
				Excavation Block 1 total	*21*	*47.5*
Excavation block 2		plowzone	limestone	cordmarked	3	26.9
				Excavation Block 2 total	*3*	*26.9*

Non-features

Provenience				Surface Treatment		
Non-ftr #	Portion	Zone	Temper	Exterior/Interior	N	W(g)
49			limestone	plain	2	6.1
			limestone	cordmarked	8	19.0
			limestone	eroded	1	1.5
49	S1/2		limestone	plain	3	26.2
			limestone	eroded	4	7.3
			limestone & grit	plain	3	11.7
			limestone & grit	cordmarked	5	12.1
			limestone & grit	eroded	2	3.0
			grog	eroded	2	1.6
				Non-feature 49 total	*30*	*88.5*
57	S1/2		limestone	plain	1	1.4
			limestone	cordmarked	2	3.7
				Non-feature 57 total	*3*	*5.1*
70	S1/2		limestone	plain	1	1.9
			limestone	cordmarked	6	7.7
			limestone	smoothed cordmarked	1	2.8
			limestone	eroded	3	2.3
				Non-feature 70 total	*11*	*14.7*
95	W1/2		limestone	cordmarked	2	6.3
				Non-feature 95 total	*2*	*6.3*
99	S1/2		limestone	cordmarked	30	281.7
			limestone	plain-cordmarked	1	7.3
			limestone	eroded	20	65.2
			grog	smoothed cordmarked	2	26.3
			grog	plain	3	46.0
				Non-feature 95 total	*56*	*426.5*
175	E1/2		limestone	cordmarked	2	24.8
			limestone	smoothed cordmarked	2	82.8
			limestone	eroded	1	4.2
				Non-feature 175 total	*5*	*111.8*
176	E1/2		limestone	plain	2	3.8
			limestone	cordmarked	5	103.1
			grog	cordmarked	1	6.0
				Non-feature 176 total	*8*	*112.9*

APPENDIX B.
CERAMIC ATTRIBUTES-Body Sherds

Non-features

Feature #	Provenience Portion	Zone	Temper	Surface Treatment	N	W(g)
77	N1/2	A1	limestone	plain	1	1.3
				Feature 77 total	*1*	*1.3*
90	SW1/4		limestone	cordmarked	1	47.5
				Feature 90 total	*1*	*47.5*
210	N1/2		limestone	plain-cordmarked	1	3.4
				Feature 210 total	*1*	*3.4*

APPENDIX B.
CERAMIC ATTRIBUTES-Other

Feature #	Provenience Portion	Zone	Temper	Surface Treatment	N	W(g)	Type
6	E1/2		grit	plain	1	5.5	appendage
8	N1/2		limestone	cordmarked	1	44.3	handle
21	E1/2	F	limestone	eroded	1	2.1	conical/triangular lug
21	E1/2	rodent run	limestone	cordmarked	1	7.5	unknown
23	E1/2		limestone & grit	cordmarked	1	16.8	disk
36	N1/2	gen. fill	no temper	plain	1	3.5	unknown
61	S1/2	2 & 3	limestone	cordmarked	1	12.1	loop handle
			grit	plain	1	20.7	sherd disk
79	S1/2		limestone	plain	5	113.1	conjoined to seed jar
			limestone	plain & cordmarked	6	39.2	conjoined to rims
			limestone	cordmarked	1	82.1	sieve
79	N1/2	A	limestone	smoothed cordmarked	2	27.9	conjoined to jar rims
79	N1/2	B	limestone	cordmarked	1	15.5	conjoined to rims
79	N1/2	C	limestone	plain	2	19.2	conjoined to bowl
			limestone	cordmarked	1	22.6	sieve fragment
			limestone	cordmarked	2	25.6	conjoined to bowl
			limestone	cordmarked	2	10.2	conjoined to jar
			limestone	cordmarked	1	13.5	conjoined to bowl jar
96	N1/2		limestone	cordmarked	1	73.5	jar neck
96	S1/2		limestone	cordmarked	1	25.8	suspension hole in body sherd
128	SE1/2	PM 28	limestone	cordmarked	1	9.8	disk
135	N1/2		grit	plain	1	10.3	MCS (orange)
			grit	cordmarked	2	55.9	MCS (grey)
135	S1/2	D	no temper	plain	1	1.2	probable pinch pot
139	E1/2		no temper		1	1.7	effigy?
142	W1/2		pinch pot	grog	1	34.5	PP 8 complete
155	SW1/2		limestone	plain	1	104.8	spindle wheel
165	N1/2				1	20.9	disk
166	W1/2				1	50.1	ceramic form ?
170	E1/2				1	6.3	Mud Daubers nest
206	E1/2	A	limestone	plain	1	2.8	small disk
221	E1/2		limestone	eroded	1	2.1	possible Castellation

APPENDIX B.
CERAMIC ATTRIBUTES-Other

Feature #	Provenience Portion	Zone	Temper	Surface Treatment	N	W(g)	Type
221	W1/2		limestone	plain	1	18.9	handle
222	W1/2		grog		1	9.6	pinch pot
					1	54.4	clay disk
233	E1/2		limestone	cordmarked	1	13.8	disk
264	W1/2	C	limestone	cordmarked	1	27.0	sherd disk

APPENDIX B.
CERAMIC ATTRIBUTES-Sherdlettes

Provenience				
Feature #	Portion	Zone	N	W(g)
1-2	N1/2		47	23.4
1-2	S1/2	A	26	11.3
	S1/2	B	8	3.3
	Feature 1/2 total		*81*	*38.0*
3	N1/2	A	5	2.2
	Feature 3 total		*5*	*2.2*
4	N1/2		12	5.8
	S1/1		10	4.9
	Feature 4 total		*22*	*10.7*
5	N1/2		60	37.5
	S1/2		321	172.8
	Feature 5 total		*381*	*210.3*
6	W1/2		150	87.8
	E1/2		315	176.1
	Feature 6 total		*465*	*263.9*
7	N1/2		22	12.7
	S1/2		56	26.2
	Feature 7 total		*78*	*38.9*
8	N1/2		42	27.9
	S1/2		105	55.8
	Feature 8 total		*147*	*83.7*
9/158	SE1/4	1	23	13.5
	SE1/4	2	39	18.7
	NW1/4	1	51	24.8
	NW1/4	PM 1	1	0.5
	NW1/4	N. wall	1	0.2
	NE1/4		32	13.1
	SW1/2		16	6.0
	Feature 9/158 total		*163*	*76.8*
10/157	W1/2		52	43.3
	E1/2	A	56	33.5
	Feature 10/157 total		*108*	*76.8*
15	E1/2		8	3.7
	W1/2		24	13.3
	Feature 15 total		*32*	*17.0*
16	W1/2		62	38.3
	E1/2		28	14.4
	Feature 16 total		*90*	*52.7*
17	S1/2		3	1.6
	Feature 17 total		*3*	*1.6*
20	W1/2		146	78.8
	E1/2		18	9.4
	Feature 20 total		*164*	*88.2*
21	W1/2		105	68.6
	E1/2	A	50	26.5
	E1/2	B	11	9.3
	E1/2	D	18	11.6
	E1/2	E	5	1.3
21	E1/2	F	7	4.4
	E1/2	rodent run	7	4.1
	Feature 21 total		*203*	*127.8*
22	E1/2		53	25.1
	W1/2		9	6.0
	Feature 22 total		*62*	*31.1*
23	surface scatter		41	28.9
	SW14		445	292.6
	NW1/4		180	115.7
	E1/2		425	329.8
	Feature 23 total		*1091*	*767.0*
27	E1/2		13	6.8
	W1/2		21	9.9
	Feature 27 total		*34*	*16.7*
31	S1/2	A	90	46.1
	N1/2	A	28	19.4
	Feature 31 total		*118*	*65.5*
33	E1/2		28	22.8
	W1/2	A	12	7.9
	W1/2	B	27	13.6
	W1/2	C	8	3.8
	Feature 33 total		*75*	*48.1*
34	N1/2	A	82	47.7
	S1/2	A	18	10.1
	Feature 34 total		*100*	*57.8*
36	S1/2	Gen. fill	219	128.8
	N1/2	Gen. fill	112	71.2
	N1/2	conc.2	160	86.6
	Feature 36 total		*491*	*286.6*
38	N1/2		112	88.1
	S1/2		290	164.3
	Feature 38 total		*402*	*252.4*
40	S1/2		116	56.4
	N1/2		73	38.1
	Feature 40 total		*189*	*94.5*
41	W1/2	A	1	0.7
	E1/2	A	2	2.3
	Feature 41 total		*3*	*3.0*
42	N1/2		97	104.6
	S1/2		38	40.2
	Feature 42 total		*135*	*144.8*
45	N1/2		4	1.9
	S1/2		3	3.6
	Feature 45 total		*7*	*5.5*
46	E1/2		35	19.9
	W1/2		25	12.8
	Feature 46 total		*60*	*32.7*
47	W1/2	A	86	47.6

APPENDIX B.
CERAMIC ATTRIBUTES-Sherdlettes

	Provenience			
Feature #	Portion	Zone	N	W(g)
47	E1/2	A	102	58.2
	E1/2	B	50	25.7
	E1/2	C	21	10.5
	Feature 47 total		*259*	*142.0*
48	NW1/2		141	84.5
	E1/2		58	34.9
	Feature 48 total		*199*	*119.4*
51	S1/2		1	0.4
	Feature 51 total		*1*	*0.4*
55	W1/2		7	3.8
	E1/2		6	4.9
	Feature 55 total		*13*	*8.7*
60	SW1/2		2	1.0
	Feature 60 total		*2*	*1.0*
61	N1/2		56	35.1
	S1/2	1	40	22.3
	S1/2	2 and 3	24	15.8
	Feature 61 total		*120*	*73.2*
62	E1/2		32	19.0
	W1/2	1	4	4.7
	Feature 62 total		*36*	*23.7*
63	N1/2		6	2.6
	Feature 63 total		*6*	*2.6*
64	W1/2	A1	24	15.1
	W1/2	A2	20	14.3
	E1/2	A	409	234.4
	Feature 64 total		*453*	*263.8*
65	E1/2		33	15.9
	W1/2	A	13	5.6
	W1/2	B	10	5.9
	Feature 65 total		*56*	*27.4*
67	E1/2		40	18.4
	W1/2	C	10	5.9
	W1/2	E	29	16.8
	Feature 67 total		*79*	*41.1*
72	W1/2	A	97	44.9
	E1/2	A	27	70.6
	E1/2	B	16	10.4
	E1/2	C	26	15.9
	Feature 72 total		*166*	*141.8*
77	S1/2	A	173	128.9
	N1/2	A1	113	109.2
	N1/2	A2	31	29.3
	Feature 77 total		*317*	*267.4*
77	N1/2	A2	31	29.3
	Feature 77 total		*31*	*29.3*
79	S1/2		184	124.2
79	N1/2	A	39	258.0
79	N1/2	B	103	61.8
	N1/2	C	20	15.5
	N1/2	D	6	4.8
	Feature 79 total		*352*	*464.3*
80	S1/2		270	191.1
	N1/2	A	12	19.7
	N1/2	B	6	1.8
	N1/2	C	14	11.9
	Feature 80 total		*302*	*224.5*
81	W1/2		42	24.0
	E1/2	A	20	9.4
	E1/2	B	8	5.6
	Feature 81 total		*70*	*39.0*
82	S1/2		336	308.2
	N1/2	A	147	156.9
	N1/2	B	3	2.7
	N1/2	C	90	79.9
	Feature 82 total		*576*	*547.7*
83	N1/2		30	19.7
	S1/2		8	3.6
	Feature 83 total		*38*	*23.3*
87	SW1/4		19	10.1
	NW1/4		19	11.6
	NE1/4		1	0.4
	SE1/4		6	4.1
	Feature 87 total		*45*	*26.2*
88	NW1/2		6	5.1
	SE1/2	A	131	80.6
	SE1/2	B	6	5.2
	Feature 88 total		*143*	*90.9*
89	N1/2	A1	15	6.4
	N1/2	B1	5	2.4
	N1/2	B2	2	0.6
	S1/2		62	32.8
	Feature 89 total		*84*	*42.2*
90	E1/2		72	75.5
	SW1/4		268	205.8
	NW1/4		101	75.9
	Feature 90 total		*441*	*357.2*
94	E1/2		43	28.6
	W1/2	A	78	52.0
	W1/2	B	19	11.2
	Feature 94 total		*140*	*91.8*
96	N1/2		242	209.3
	S1/2		194	198.5
	floor		1	1.3
	Feature 96 total		*437*	*409.1*
102	E1/2		23	18.0

APPENDIX B.
CERAMIC ATTRIBUTES-Sherdlettes

Provenience Feature #	Portion	Zone	N	W(g)
102	W1/2		17	14.7
	Feature 102 total		*40*	*32.7*
103	S1/2		21	21.0
	Feature 103 total		*21*	*21.0*
104	E1/2		15	15.3
	W1/2		38	43.8
	Feature 104 total		*53*	*59.1*
105	E1/2		2	1.3
	W1/2		12	9.0
	Feature 105 total		*14*	*10.3*
106	E1/2		5	4.4
	W1/2		6	3.9
	Feature 106 total		*11*	*8.3*
107	surface		9	3.1
	W1/2		161	75.2
	E1/2		124	68.5
	E1/2		4	1.7
	Feature 107 total		*298*	*148.5*
108	W1/2		15	9.3
	E1/2		51	29.6
	Feature 108 total		*66*	*38.9*
109	W1/2		49	21.0
	E1/2		23	14.4
	Feature 109 total		*72*	*35.4*
110	E1/2	A1	22	13.7
	E1/2	A2	25	14.2
	E1/2	A3	2	0.8
	W1/2		186	116.6
	Feature 110 total		*235*	*145.3*
111	N1/2		8	4.9
	S1/2		4	3.3
	Feature 111 total		*12*	*8.2*
115	N1/2		15	13.8
	Feature 115 total		*15*	*13.8*
119	E1/2		184	180.7
	W1/2		142	132.6
	Feature 119 total		*326*	*313.3*
120	E1/2		8	5.7
	W1/2		21	13.1
	Feature 120 total		*29*	*18.8*
122	N1/2		10	4.7
	S1/2	A	1	0.5
122	S1/2	C	1	0.6
	S1/2	D	2	1.7
	Feature 122 total		*14*	*7.5*
124	N1/2		20	10.8
	S1/2		11	7.6
	Feature 124 total		*31*	*18.4*

Provenience Feature #	Portion	Zone	N	W(g)
125	N1/2		36	21.1
	S1/2		71	37.7
	Feature 125 total		*107*	*58.8*
126	E1/2	A	19	13.9
	W1/2		8	7.2
	Feature 126 total		*27*	*21.1*
127	N1/2		70	38.6
	S1/2		93	63.7
	Feature 127 total		*163*	*102.3*
128	E1/2		164	148.4
	W1/2	A	31	21.4
	W1/2	B	12	13.0
	Feature 128 total		*207*	*182.8*
129	S1/2		90	114.6
	N1/2		13	8.5
	Feature 129 total		*103*	*123.1*
130	W1/2		5	4.2
	Feature 130 total		*5*	*4.2*
131	N1/2		3	3.2
	S1/2		1	1.1
	Feature 131 total		*4*	*4.3*
132	E1/2	A	13	29.2
	E1/2	B	3	3.0
	Feature 132 total		*16*	*32.2*
133	N1/2		4	1.5
	Feature 133 total		*4*	*1.5*
134	S1/2		9	4.1
	N1/2		2	1.0
	Feature 134 total		*11*	*5.1*
135	N1/2		104	54.5
	S1/2	D	34	22.6
	Feature 135 total		*138*	*77.1*
137	E1/2		133	110.8
	W1/2		4	5.5
	W1/2	1-2	21	16.0
	W1/2	3-4-5	6	3.7
	W1/2	B7	9	4.9
	W1/2	8	4	2.5
	Feature 137 total		*177*	*143.4*
138	W1/2		36	26.0
	E1/2		20	12.9
138	E1/2	B	6	4.4
	Feature 122 total		*62*	*43.3*
139	E1/2		26	14.7
	W1/2		1	0.8
	Feature 139 total		*27*	*15.3*
141	E1/2		205	198.1

APPENDIX B.
CERAMIC ATTRIBUTES-Sherdlettes

Provenience				
Feature #	Portion	Zone	N	W(g)
141	W1/2		143	133.8
	Feature 141 total		*348*	*331.9*
142	W1/2		95	58.0
	E1/2	A	14	8.5
	E1/2	B	49	29.3
	E1/2	B/C	4	2.0
	E1/2	C	69	44.5
	Feature 142 total		*231*	*142.3*
144	N1/2	A	7	5.6
	N1/2	B	2	1.9
	S1/2		42	26.5
	Feature 144 total		*51*	*34.0*
146	SW1/2		9	8.0
	Feature 146 total		*9*	*8.0*
147	E1/2		7	6.0
	W1/2		19	17.5
	Feature 147 total		*26*	*23.5*
148	E1/2		6	7.0
	Feature 148 total		*6*	*7.0*
149	S1/2		4	2.4
	Feature 149 total		*4*	*2.4*
150	W1/2		18	26.6
	E1/2		7	3.6
	Feature 150 total		*25*	*30.2*
151	N1/2	A	1	0.5
	S1/2		10	6.3
	Feature 151 total		*11*	*6.8*
154	N1/2	A and B	137	219.1
	N1/2	C	9	8.9
	S1/2		120	112.5
	Feature 154 total		*266*	*340.5*
155	NE1/2	A	24	33.3
	S1/2		112	108.7
	Feature 155 total		*136*	*142.0*
156	E1/2		1	0.4
	W1/2		6	3.4
	Feature 156 total		*7*	*3.8*
159	N1/2		63	43.6
	burned areas		6	4.4
	S1/2		128	77.0
	Feature 159 total		*197*	*125.0*
160	N1/2		14	17.5
	S1/2		21	22.4
	Feature 160 total		*35*	*39.9*
161	E1/2		4	3.1
	W1/2		8	4.4
	Feature 161 total		*12*	*7.5*

Provenience				
Feature #	Portion	Zone	N	W(g)
163	E1/2		3	2.1
	Feature 163 total		*3*	*2.1*
164	N1/2		15	10.6
	S1/2	A1	33	75.5
	Feature 164 total		*48*	*86.1*
165	N1/2		27	14.5
	S1/2		85	67.0
	Feature 165 total		*112*	*81.5*
166	W1/2		4	1.3
	E1/2		8	4.9
	Feature 166 total		*12*	*6.2*
167	E1/2		4	2.2
	W1/2		20	8.0
	Feature 167 total		*24*	*10.2*
168	E1/2		5	3.8
	W1/2		4	2.8
	Feature 168 total		*9*	*6.6*
169	E1/2		1	1.1
	Feature 169 total		*1*	*1.1*
170	E1/2		15	9.6
	W1/2	A	6	3.8
	W1/2	B	4	5.0
	Feature 170 total		*25*	*18.4*
171	E1/2		2	1.3
	Feature 171 total		*2*	*1.3*
172	E1/2		8	4.9
	Feature 172 total		*8*	*4.9*
173	E1/2		1	0.8
	Feature 173 total		*1*	*0.8*
174	E1/2		2	2.3
	Feature 174 total		*2*	*2.3*
177	E1/2		44	39.2
	W1/2	.	61	82.7
	Feature 177 total		*105*	*120.9*
178	N1/2		50	69.8
	S1/2		87	74.2
	Feature 178 total		*137*	*144.0*
179	E1/2		77	59.2
	W1/2	A1	30	35.1
	W1/2	A2	46	39.3
	Feature 179 total		*153*	*133.6*
180	S1/2		83	58.9
	N1/2		18	13.9
	Feature 180 total		*91*	*72.8*
181	S1/2		6	2.5
	Feature 181 total		*6*	*2.5*
182	N1/2		11	8.8

APPENDIX B.
CERAMIC ATTRIBUTES-Sherdlettes

	Provenience			
Feature #	Portion	Zone	N	W(g)
182	S1/2		88	44.9
	Feature 182 total		*99*	*53.7*
190	S1/2		2	1.4
	Feature 190 total		*2*	*1.4*
191	E1/2		1	0.5
	Feature 191 total		*1*	*0.5*
200		entire feature	1	0.8
	Feature 200 total		*1*	*0.8*
206	E1/2	A	47	40.8
	E1/2	B	4	2.8
	Feature 206 total		*51*	*43.6*
208	E1/2		4	2.5
	Feature 208 total		*4*	*2.5*
209	N1/2		10	6.6
	Feature 209 total		*10*	*6.6*
210	S1/2		27	13.8
	N1/2	A1	42	28.9
	Feature 210 total		*69*	*42.7*
216			14	9.3
	Feature 216 total		*14*	*9.3*
221	E1/2		322	189.4
	E1/2	A	7	2.8
	W1/2		122	80.5
	W1/2	A	22	23.4
	Feature 221 total		*473*	*296.1*
222	E1/2		158	122.3
	W1/2		89	71.1
	Feature 222 total		*247*	*193.4*
223	E1/2		87	75.7
	W1/2	A	9	11.1
	W1/2	B	45	39.3
	Feature 223 total		*141*	*124.1*
224	E1/2		53	62.3
	W1/2	A	47	37.9
	W1/2	B	20	23.3
	Feature 224 total		*120*	*123.5*
225	W1/2		11	15.2
	Feature 225 total		*11*	*15.2*
226	E1/2		16	25.3
	W1/2		21	21.7
	Feature 226 total		*37*	*47.0*
228	W1/2	A1 & A2	3	1.5
	W1/2	B1 & B2	71	83.9
	W1/2	C	58	47.9
228	W1/2	ash lens	1	0.1
	Feature 228 total		*133*	*133.4*
229	E1/2		641	822.8

	Provenience			
Feature #	Portion	Zone	N	W(g)
229	W1/2	profile 4	14	7.7
	Feature 228 total		*655*	*830.5*
230	E1/2	A	36	17.9
	E1/2	B	7	4.3
	W1/2		13	5.8
	Feature 230 total		*56*	*27.0*
232	E1/2		14	21.5
	W1/2		4	6.8
	Feature 230 total		*18*	*28.3*
233	E1/2		42	75.9
	W1/2		61	93.0
	Feature 233 total		*103*	*168.9*
234	W1/2		2	0.9
	E1/2		2	1.5
	Feature 233 total		*4*	*2.4*
235	W1/2	A2	3	1.6
	E1/2		22	12.0
	W1/2	B1	3	1.4
	W1/2	B2	5	1.4
	Feature 235 total		*33*	*16.4*
236	NE1/4		22	19.5
	E1/2		177	232.7
	W1/2		3	1.8
	W1/2	1B	10	9.6
	W1/2	1C	12	9.7
	W1/2	2	20	16.5
	W1/2	3	30	32.6
	W1/2	disturbed	3	1.3
	Feature 236 total		*277*	*323.7*
241			9	13.1
	Feature 241 total		*9*	*13.1*
243			6	11.6
	Feature 243 total		*6*	*11.6*
244			4	10.4
	Feature 244 total		*4*	*10.4*
253	all		11	4.2
	Feature 253 total		*11*	*4.2*
254	E1/2		1	0.9
	Feature 254 total		*1*	*0.9*
255	W1/2		54	26.2
	E1/2		72	41.6
	Feature 255 total		*126*	*67.8*
256	N1/2		21	17.2
	S1/2		21	17.8
	Feature 256 total		*42*	*35.0*
257	W1/2		1	0.9
	Feature 257 total		*1*	*0.9*

APPENDIX B.
CERAMIC ATTRIBUTES-Sherdlettes

Provenience				
Feature #	Portion	Zone	N	W(g)
258	W1/2		7	4.2
	E1/2		43	10.3
	Feature 258 total		*50*	*14.5*
259	S1/2	A	10	6.2
	N1/2	A	8	5.6
	Feature 259 total		*18*	*11.8*
264	E1/2		48	104.1
	W1/2	A	13	18.2
	W1/2	C	1	0.3
	Feature 264 total		*62*	*122.6*
265	S1/2		2	2.0
	N1/2	A	10	11.0
	Feature 265 total		*12*	*13.0*
266	SW1/2		15	12.6
	W1/2	F	2	1.7
	NE1/2	A	2	0.9
	NE1/2	B	26	13.6
	NE1/2	D	4	3.0
	NE1/2	E	6	5.2
	E1/2	F	21	15.6
	Feature 266 total		*76*	*52.6*
267	E1/2		8	10.0
	W1/2		6	4.3
	Feature 267 total		*14*	*14.3*
269	E1/2		98	85.9
	W1/2	A	65	66.4
	Feature 269 total		*163*	*152.3*
270	N1/2		6	3.7
	Feature 270 total		*6*	*3.7*

Non-Features

Provenience				
Non-Ftr #	Portion	Zone	N	W(g)
49A			14	8.6
	Non-Feature 49A total		*14*	*8.6*
49	S1/2		21	13.0
	Non-Feature 49 total		*21*	*13.0*
70	S1/2		36	18.4
	Non-Feature 70 total		*36*	*18.4*
95	W1/2		4	1.9
	Non-Feature 95 total		*4*	*1.9*
99	S1/2		310	242.9
	Non-Feature 99 total		*310*	*242.9*
175	E1/2		7	5.4
	Non-Feature 175 total		*7*	*5.4*
176	E1/2		6	5.9
	Non-Feature 176 total		*6*	*5.9*

Test Units

Provenience				
Unit #	Portion	Depth	N	W(g)
1		0-11cm	26	14.6
		11-20cm	20	10.8
		21-30cm	22	8.9
		31-40cm	6	3.3
	Unit 1 total		*74*	*37.6*
3		0-10cm	3	2.3
		11-20cm	3	3.1
		21-30cm	4	3.2
	Unit 3 total		*10*	*8.6*
Excavation Block# 1			9	8.6
	Block# 1 total		*9*	*8.6*

APPENDIX B.
CERAMIC ATTRIBUTES-Daub

	Provenience			
Feature #	Portion	Zone	N	W(g)
1*2	N1/2		113	86.0
1*2	S1/2	A	34	27.7
	S1/2	B	38	31.0
	S1/2	C	1	0.4
	Feature 1/2 total		*186*	*145.1*
3	N1/2	A	26	38.5
	Feature 3 total		*26*	*38.5*
4	N1/2		5	20.9
	S1/2		2	5.7
	Feature 4 total		*7*	*26.6*
5	S1/2		98	90.3
	Feature 5 total		*98*	*90.3*
6	W1/2		58	61.3
	E1/2		69	110.7
	Feature 6 total		*127*	*172.0*
7	N1/2		3	5.6
	S1/2		8	3.9
	Feature 7 total		*11*	*9.5*
8	N1/2		23	11.8
	S1/2		7	4.9
	Feature 8 total		*30*	*16.7*
9/158	SE1/4	1	9	11.9
	SE1/4	2	2	0.7
	NW1/4	1	4	3.4
	NW1/4		4	6.3
	Feature 9/158 total		*19*	*22.3*
10/158	W1/2		46	21.6
	E1/2	A	6	3.8
	Feature 10/158 total		*52*	*25.4*
15	E1/2		3	1.6
	W1/2		6	14.0
	Feature 15 total		*9*	*15.6*
16	W1/2		50	62.0
	E1/2		28	29.8
	Feature 16 total		*78*	*91.8*
20	W1/2		30	884.8
	E1/2		4	3.1
	Feature 20 total		*34*	*887.9*
21	W1/2		82	61.8
	E1/2	A	21	13.3
	E1/2	B	5	9.8
	E1/2	C	3	2.0
	E1/2	D	8	5.1
	E1/2	E	5	3.4
	E1/2	F	2	1.0
21	E1/2	rodent ru	9	14.8
	Feature 21 total		*135*	*111.2*
22	E1/2		81	212.0

	Provenience			
Feature #	Portion	Zone	N	W(g)
22	W1/2		78	68.6
	Feature 22 total		*78*	*68.6*
23	surface scatter		22	14.6
	SW1/4		555	605.3
	NW1/4		141	176.3
	E1/2		227	519.7
	Feature 23 total		*945*	*1315.9*
27	E1/2		3	0.9
	W1/2		2	0.8
	Feature 27 total		*5*	*1.7*
31	S1/2	A	9	6.8
	N1/2	A	1	3.0
	Feature 31 total		*10*	*6.9*
33	E1/2		68	71.7
	W1/2	A	15	10.0
	W1/2	B	97	114.4
	W1/2	C	11	6.7
	Feature 33 total		*191*	*202.8*
34	N1/2	A	25	16.9
	S1/2	A	12	4.8
	Feature 34 total		*37*	*21.7*
36	S1/2	gen. fill	74	67.2
	N1/2	gen. fill	73	250.1
	Feature 36 total		*147*	*317.3*
38	N1/2		10	9.7
	S1/2		22	16.7
	Feature 38 total		*32*	*26.4*
40	S1/2		22	18.4
	N1/2		44	101.7
	Feature 40 total		*66*	*120.1*
42	N1/2		4	10.0
	S1/2		3	1.5
	Feature 42 total		*7*	*11.5*
44	E1/2		1	1.0
	Feature 44 total		*1*	*1.0*
46	E1/2		11	7.2
	W1/2		10	5.5
	Feature 46 total		*21*	*12.7*
47	W1/2	A	63	187.6
	E1/2	A	8	5.3
	E1/2	B	11	16.8
	E1/2	C	3	1.8
	Feature 46 total		*85*	*211.5*
48	NW1/2		4	11.1
48	E1/2		1	6.2
	Feature 48 total		*5*	*17.3*
55	W1/2		6	35.2

APPENDIX B.
CERAMIC ATTRIBUTES-Daub

Feature #	Provenience Portion	Zone	N	W(g)
55	E1/2		1	3.6
	Feature 55 total		*7*	*38.8*
59	NE1/2		2	1.2
	Feature 59 total		*2*	*1.2*
60	NE1/2	A	25	25.2
	SW1/2		88	100.1
	Feature 60 total		*113*	*125.3*
61	N1/2		21	18.8
	S1/2	2 & 3	38	64.7
	S1/2	4	2	2.2
	Feature 61 total		*61*	*85.7*
62	E1/2		24	70.7
	W1/2	1	4	13.0
	Feature 62 total		*28*	*83.7*
64	W1/2	A1	44	53.0
	W1/2	A2	59	65.0
	E1/2	A	206	276.8
	Feature 64 total		*309*	*394.8*
65	E1/2		5	5.9
	W1/2	A	3	1.5
	W1/2	B	1	0.9
	Feature 65 total		*9*	*8.3*
67	E1/2		48	48.6
	W1/2	C	4	4.3
	W1/2	E	51	74.6
	Feature 67 total		*103*	*127.5*
72	W1/2	A	37	60.0
	E1/2	A	4	1.9
	E1/2	B	2	2.3
	E/2	C	8	7.1
	Feature 72 total		*51*	*71.3*
77	S1/2	A	96	109.6
	N1/2	A1	108	163.9
	N1/2	A2	27	21.5
	Feature 77 total		*231*	*295.0*
79	S1/2		519	484.6
	N1/2	A	38	50.6
	N1/2	B	379	300.8
	N1/2	C	62	40.4
	N1/2	D	2	0.9
	Feature 79 total		*1000*	*877.3*
80	S1/2		98	97.3
	N1/2	B	1	1.1
80	N1/2	C	2	3.0
	Feature 80 total		*101*	*101.4*
81	W1/2		9	6.8
	E1/2	A	7	3.9
	Feature 81 total		*16*	*10.7*
82	S1/2		22	22.4
	N1/2	A1	2	3.3
	N1/2	B2	1	0.6
	Feature 82 total		*25*	*26.3*
83	S1/2		5	2.5
	Feature 83 total		*5*	*2.5*
87	SW1/4		3	2.2
	Feature 87 total		*3*	*2.2*
88	SE1/2	B	2	3.2
	Feature 88 total		*2*	*3.2*
89	N1/2	A1	10	46.1
	N1/2	A2	3	9.3
	N1/2	B1	1	1.0
	N1/2	B2	1	1.3
	S1/2		55	43.2
	Feature 89 total		*70*	*100.9*
90	E1/2		6	8.1
	SW1/4		33	28.0
	NW1/4		8	6.4
	Feature 90 total		*47*	*42.5*
94	E1/2		24	23.5
	W1/2	A	43	156.4
	W1/2	B	5	20.1
	Feature 94 total		*72*	*200.0*
96	N1/2		4	14.5
	S1/2		84	224.0
	floor		3	63.9
	Feature 96 total		*91*	*302.4*
102	E1/2		6	6.7
	W1/2		13	15.8
	Feature 102 total		*19*	*22.5*
103	S1/2		5	3.5
	Feature 103 total		*5*	*3.5*
104	W1/2		9	7.1
	Feature 104 total		*9*	*7.1*
105	E1/2		8	11.4
	W1/2		8	7.7
	Feature 105 total		*16*	*19.1*
106	E1/2		4	3.8
	W1/2		6	7.6
	Feature 106 total		*10*	*11.4*
107	surface		5	2.6
107	W1/2		21	28.0
	E1/2		13	25.5
	PM# 38		1	0.9
	Feature 107 total		*40*	*57.0*
108	W1/2		12	5.8
	Feature 108 total		*12*	*5.8*

APPENDIX B.
CERAMIC ATTRIBUTES-Daub

	Provenience			
Feature #	Portion	Zone	N	W(g)
109	W1/2		100	71.4
	E1/2		7	15.8
	Feature 109 total		*107*	*87.2*
110	E1/2	A1	17	18.0
	E1/2	A2	19	85.6
	E1/2	A3	2	1.1
	W1/2		309	205.4
	Feature 110 total		*347*	*310.1*
111	N1/2		10	10.7
	S1/2		2	2.7
	Feature 111 total		*12*	*13.4*
115	S1/2		1	1.0
	Feature 115 total		*1*	*1.0*
119	E1/2		4	6.8
	W1/2		6	34.6
	Feature 119 total		*10*	*41.4*
120	E1/2		7	168.2
	W1/2		135	194.4
	Feature 120 total		*142*	*362.6*
122	N1/2		10	7.9
	S1/2	D	3	4.9
	Feature 122 total		*13*	*12.8*
123	S1/2		1	1.7
	N1/2		1	0.9
	Feature 123 total		*2*	*2.6*
124	N1/2		20	42.4
	S1/2		26	39.3
	Feature 124 total		*46*	*81.7*
125	N1/2		20	38.0
	S1/2		81	77.6
	Feature 125 total		*101*	*115.6*
126	E1/2	A	3	15.4
	W1/2		41	65.2
	Feature 126 total		*44*	*80.6*
127	N1/2		32	27.3
	S1/2		30	29.8
	Feature 127 total		*62*	*57.1*
128	E1/2		50	86.2
	W1/2	A	2	1.0
	W1/2	B	3	4.0
	Feature 128 total		*55*	*91.2*
129	S1/2		20	19.5
	N1/2		3	2.1
	Feature 129 total		*23*	*21.6*
131	S1/2		2	5.3
	Feature 131 total		*2*	*5.3*
132	E1/2	A	2	9.6
	E1/2	B	1	6.3

	Provenience			
Feature #	Portion	Zone	N	W(g)
132	E1/2	C	1	0.4
	W1/2		2	69.2
	Feature 132 total		*3*	*69.6*
133	N1/2		2	4.0
	Feature 133 total		*2*	*4.0*
134	S1/2		1	0.4
	Feature 134 total		*1*	*0.4*
135	N1/2		36	47.2
	S1/2	D	12	35.2
	Feature 135 total		*48*	*82.4*
137	E1/2		78	171.3
	W1/2	1 & 2	4	2.7
	W1/2	B7	3	1.2
	Feature 137 total		*85*	*175.2*
138	W1/2		10	23.3
	E1/2	A	12	7.2
	E1/2	B	3	5.7
	E1/2	D	1	6.0
	Feature 138 total		*26*	*42.2*
139	E1/2		4	1.6
	Feature 139 total		*4*	*1.6*
140	N1/2	A	3	1.7
	S1/2		4	4.0
	Feature 140 total		*7*	*5.7*
141	E1/2		18	25.6
	W1/2		47	58.4
	Feature 141 total		*65*	*84.0*
142	W1/2		44	59.4
	E1/2	B	2	11.8
	E1/2	C	19	40.3
	Feature 142 total		*65*	*111.5*
144	N1/2	A	7	5.3
	N1/2	B	2	2.1
	S1/2		10	5.5
	Feature 144 total		*19*	*12.9*
147	W1/2		7	4.9
	Feature 147 total		*7*	*4.9*
149	S1/2		3	11.5
	Feature 149 total		*3*	*11.5*
150	E1/2		1	0.5
	Feature 150 total		*1*	*0.5*
151	N1/2	A	1	0.6
	S1/2		9	6.6
	Feature 151 total		*10*	*7.2*
154	N1/2	A & B	9	25.4
	N1/2	C	2	4.3
	S1/2		33	89.4
	Feature 154 total		*44*	*119.1*

APPENDIX B.
CERAMIC ATTRIBUTES-Daub

	Provenience			
Feature #	Portion	Zone	N	W(g)
155	NE1/2	A	2	14.0
	Feature 155 total		*2*	*14.0*
156	E1/2		2	3.3
	Feature 156 total		*2*	*3.3*
159	N1/2		10	40.5
	burned areas		1	11.6
	S1/2		54	53.3
	Feature 159 total		*65*	*105.4*
160	N1/2		9	17.3
	S1/2		49	40.2
	Feature 160 total		*58*	*57.5*
162	E1/2		1	13.9
	Feature 162 total		*1*	*13.9*
164	N1/2		80	111.3
	Feature 164 total		*80*	*111.3*
165	N1/2		4	11.5
	S1/2		24	62.2
	Feature 165 total		*28*	*73.7*
166	E1/2		4	5.7
	Feature 166 total		*4*	*5.7*
167	W1/2		1	1.1
	Feature 167 total		*1*	*1.1*
168	E1/2		2	0.9
	Feature 168 total		*2*	*0.9*
169	E1/2		1	0.5
	Feature 169 total		*1*	*0.5*
170	E1/2		20	19.4
	W1/2	B	1	2.8
	Feature 170 total		*21*	*22.2*
171	E1/2		27	40.6
	W1/2		13	21.9
	Feature 171 total		*40*	*62.5*
172	E1/2		2	1.8
	Feature 172 total		*2*	*1.8*
174	W1/2		6	8.6
	Feature 174 total		*6*	*8.6*
177	E1/2		6	6.0
	Feature 177 total		*6*	*6.0*
178	N1/2		3	36.5
	S1/2		28	50.2
	Feature 178 total		*31*	*86.7*
179	E1/2		36	28.6
	W1/2	A1	3	2.5
	W1/2	A2	10	18.8
	Feature 179 total		*49*	*49.9*
180	S1/2		2	0.9
	N1/2		1	3.3
	Feature 180 total		*3*	*4.2*

	Provenience			
Feature #	Portion	Zone	N	W(g)
181	S1/2		1	1.1
	Feature 181 total		*1*	*1.1*
182	N1/2		6	40.6
	S1/2		38	38.5
	Feature 182 total		*44*	*79.1*
188	hole feature		4	1.4
	Feature 188 total		*4*	*1.4*
206	E1/2	A	131	110.3
	E1/2	B	28	21.8
	W1/2		4	9.6
	Feature 206 total		*163*	*141.7*
208	W1/2		1	1.8
	Feature 208 total		*1*	*1.8*
209	N1/2		1	2.8
	Feature 209 total		*1*	*2.8*
210	S1/2		28	32.5
	N1/2	A1	32	98.4
	N1/2	A2	2	3.2
	Feature 210 total		*62*	*134.1*
216			1	0.9
	Feature 216 total		*1*	*0.9*
221	E1/2		9	20.2
	W1/2		6	14.7
	E1/2	A	2	1.4
	Feature 221 total		*17*	*36.3*
222	E1/2		10	15.7
	W1/2		21	13.0
	Feature 222 total		*31*	*28.7*
223	E1/2		30	93.4
	W1/2	A	3	9.2
	W1/2	B	6	19.2
	Feature 223 total		*39*	*121.8*
224	W1/2	A	3	1.6
	W1/2	B	3	3.6
	Feature 224 total		*6*	*5.2*
226	E1/2		4	35.0
226	W1/2		2	6.4
	Feature 226 total		*6*	*41.4*
228	E1/2		2	0.9
	W1/2	B1 & B2	11	22.0
	Feature 228 total		*13*	*22.9*
229	E1/2		244	389.7
	Feature 229 total		*244*	*389.7*
230	E1/2	A	4	2.4
	W1/2		6	11.6
	Feature 230 total		*10*	*14.0*
231	E1/2		1	0.6
	Feature 231 total		*1*	*0.6*

APPENDIX B.
CERAMIC ATTRIBUTES-Daub

Provenience				
Feature #	Portion	Zone	N	W(g)
232	E1/2		42	42.4
	W1/2		2	2.8
	Feature 232 total		*44*	*45.2*
233	E1/2		11	38.7
	W1/2		9	76.4
	Feature 233 total		*20*	*115.1*
234	W1/2		14	8.9
	E1/2		10	15.9
	Feature 234 total		*24*	*24.8*
235	E1/2		40	38.4
	W1/2	B1	1	0.9
	Feature 235 total		*41*	*39.3*
236	NE1/4		15	12.3
	E1/2		63	155.3
	W1/2	A1	2	4.5
	W1/2	B1	17	15.1
	W1/2		9	16.5
	W1/2	3	79	55.5
	W1/2	disturbed	3	1.8
	Feature 236 total		*188*	*261.0*
243			2	13.2
	Feature 243 total		*2*	*13.2*
255	W1/2		50	59.4
	E1/2		137	100.8
	Feature 255 total		*187*	*160.2*
256	N1/2		3	4.0
	Feature 256 total		*3*	*4.0*
257	E1/2		60	39.9
	W1/2		4	4.1
	Feature 257 total		*64*	*44.0*
258	E1/2		9	12.1
	Feature 258 total		*9*	*12.1*
259	S1/2	A	3	1.0
	N1/2	A	2	1.2
	Feature 259 total		*5*	*2.2*
264	E1/2		60	74.4
	Feature 264 total		*60*	*74.4*
265	N1/2	A	4	4.6
	Feature 265 total		*4*	*4.6*
266	SW1/2		14	58.7
	W1/2	F	2	2.3
	NE1/2	A	1	2.7
	NE1/2	B	7	19.0
	NE1/2	C	1	2.1
	NE1/2	D	1	0.7
	NE1/2	E	3	8.2
	E1/2	F	8	3.1
	Feature 266 total		*37*	*96.8*

Provenience				
Feature #	Portion	Zone	N	W(g)
267	W1/2		2	7.9
	Feature 267 total		*2*	*7.9*
268	S1/2		2	9.3
	Feature 268 total		*2*	*9.3*
269	E1/2		29	57.4
	W1/2	A	43	41.3
	Feature 269 total		*72*	*98.7*
270	N1/2		2	4.0
	Feature 269 total		*2*	*4.0*

Non-Features

Provenience				
Non-Ftr #	Portion	Zone	N	W(g)
26	S1/2	A	3	3.9
	Non-Feature 26 total		*3*	*3.9*
49A			1	0.3
	Non-Feature 49A total		*1*	*0.3*
49	S1/2		3	2.1
	Non-Feature 49 total		*3*	*2.1*
57	S1/2		3	1.2
	Non-Feature 57 total		*3*	*1.2*
70	S1/2		1	0.3
	Non-Feature 70 total		*1*	*0.3*
95	W1/2		1	0.3
	Non-Feature 95 total		*1*	*0.3*
99	S1/2		4	10.4
	Non-Feature 99 total		*4*	*10.4*
175	E1/2		6	5.1
	Non-Feature 175 total		*6*	*5.1*
176	E1/2		18	24.9
	Non-Feature 176 total		*18*	*24.9*

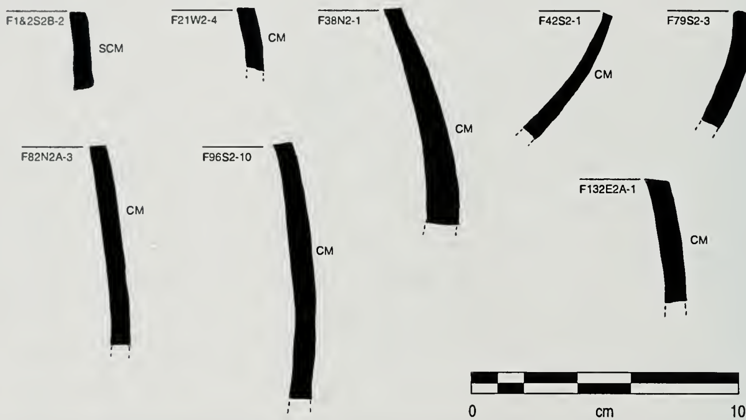
Test Units

Provenience				
Unit #	Portion	Depth	N	W(g)
1		0-11cm	8	3.0
		11-20cm	7	1.4
		21-30cm	7	3.3
		31-40cm	4	1.4
	Unit 1 total		*26*	*9.1*
2		21-30cm	1	0.3
	Unit 2 total		*1*	*0.3*
3		0-10cm	1	0.8
		21-30cm	2	0.7
	Unit 3 total		*3*	*1.5*
Excavation Block# 1			3	5.5
	Block# 1 total		*3*	*5.5*

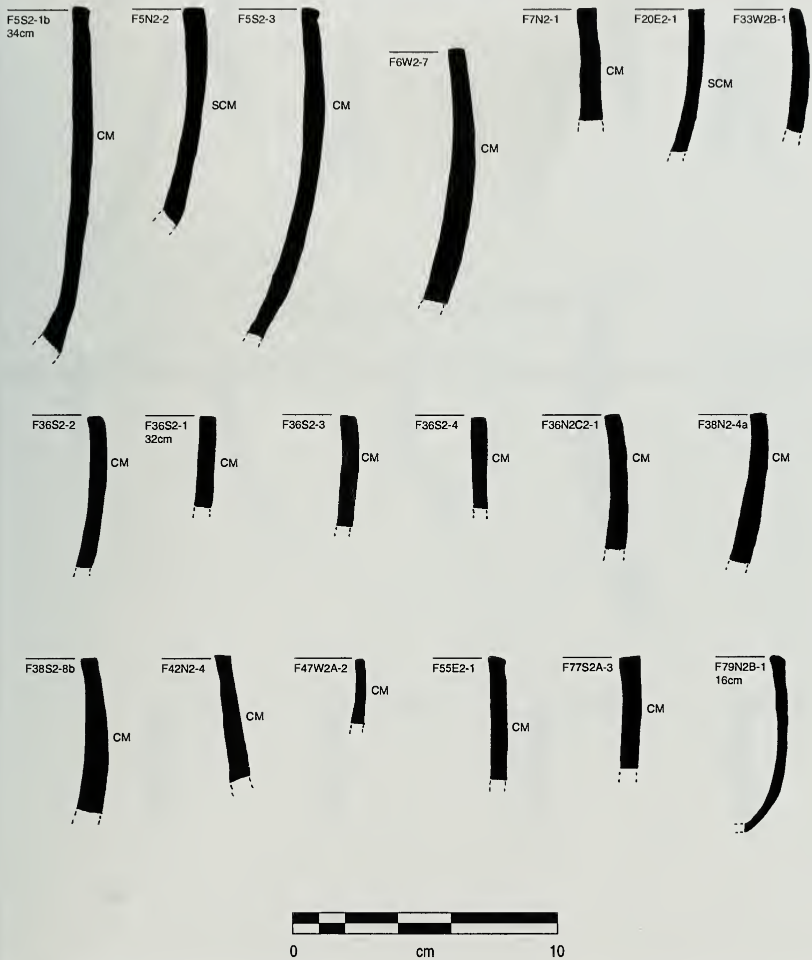
APPENDIX C.

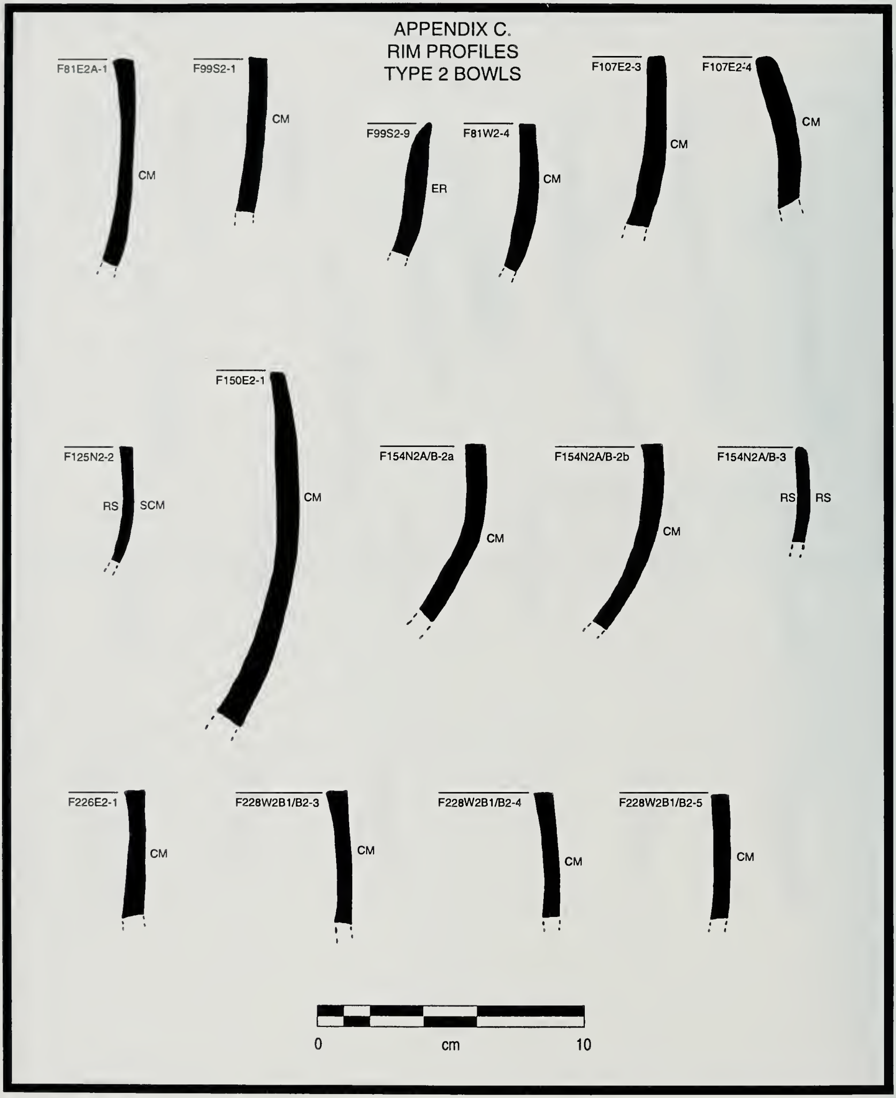
RIM PROFILES

APPENDIX C.
RIM PROFILES
TYPE 1 BOWLS

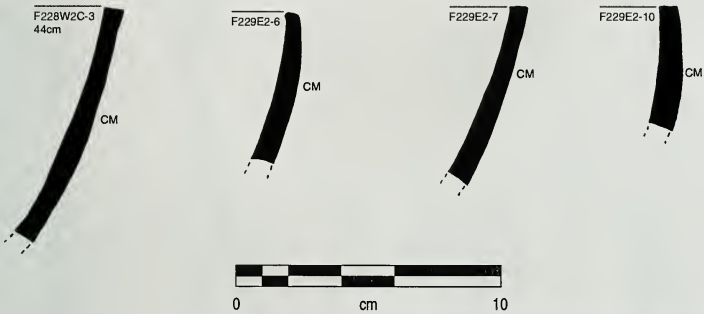


APPENDIX C.
RIM PROFILES
TYPE 2 BOWLS




APPENDIX C.
RIM PROFILES
TYPE 2 BOWLS
F81E2A-1
CM
F99S2-1
CM
F99S2-9
ER
F81W2-4
CM
F107E2-3
CM
F107E2-4
CM
F150E2-1
CM
F125N2-2
RS
SCM
F154N2A/B-2a
CM
F154N2A/B-2b
CM
F154N2A/B-3
RS
RS
F226E2-1
CM
F228W2B1/B2-3
CM
F228W2B1/B2-4
CM
F228W2B1/B2-5
CM
0
cm
10

APPENDIX C.
RIM PROFILES
TYPE 2 BOWLS



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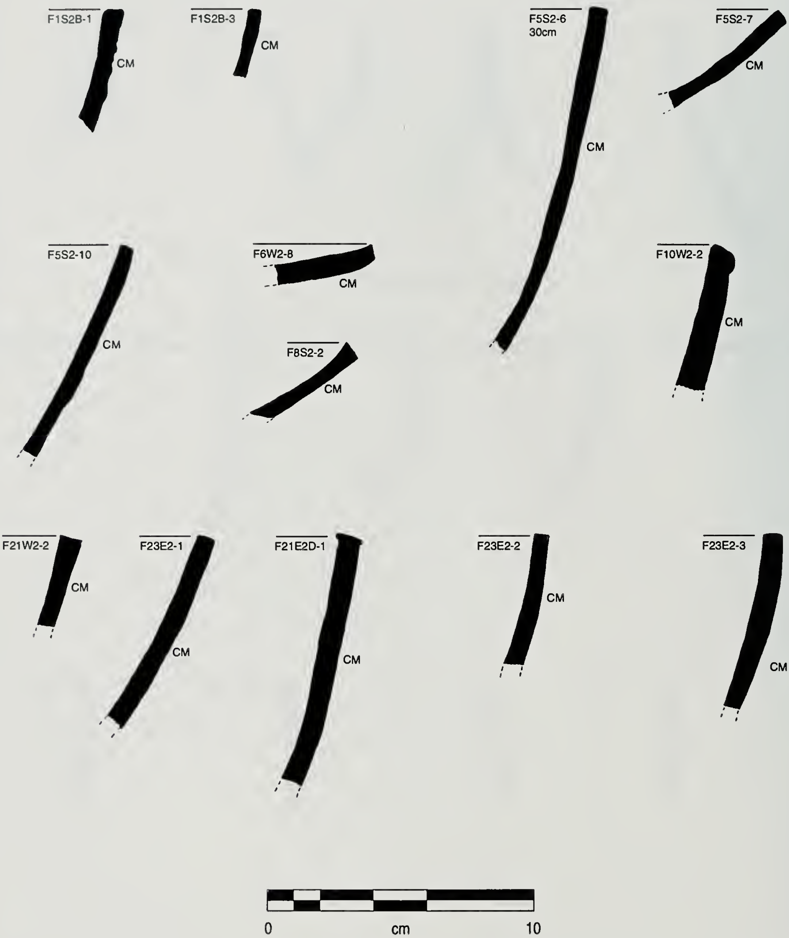
RIM PROFILES
TYPE 3 BOWLS



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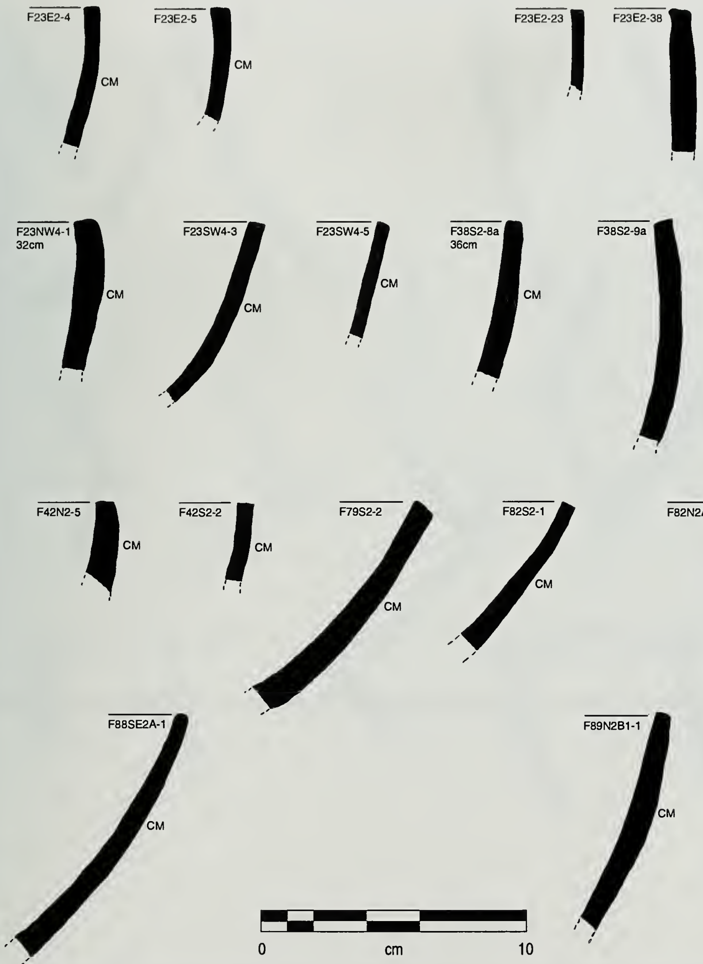
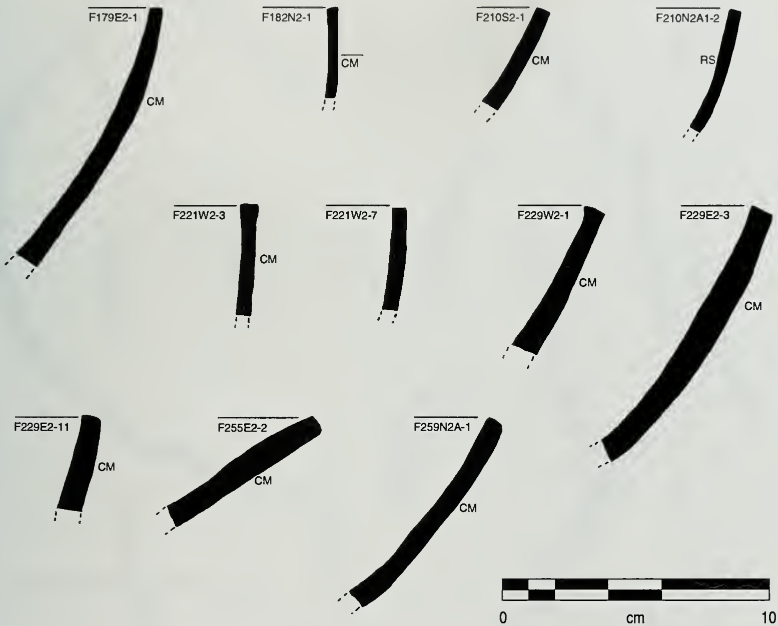
TYPE 3 BOWLS

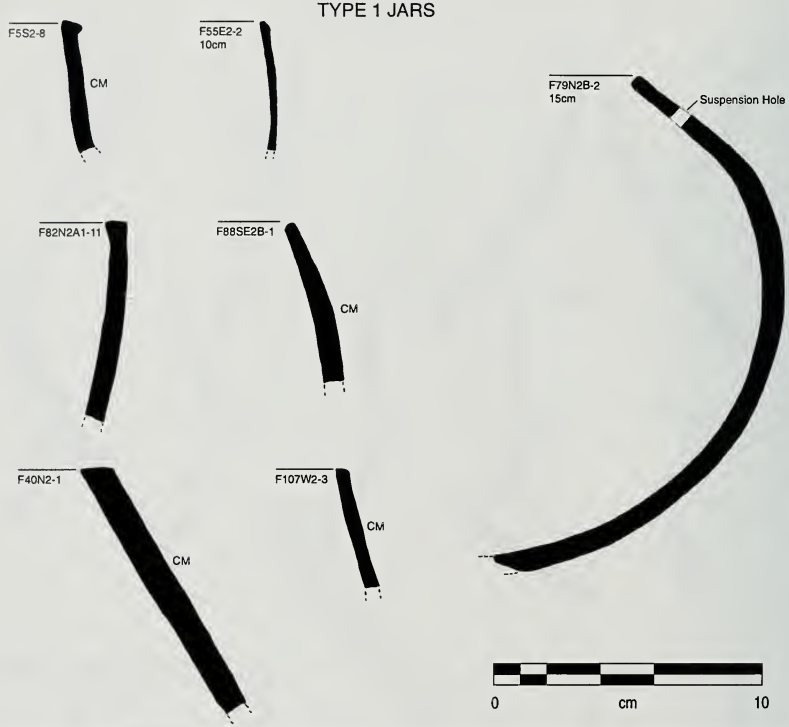


APPENDIX C.
RIM PROFILES
TYPE 3 BOWLS

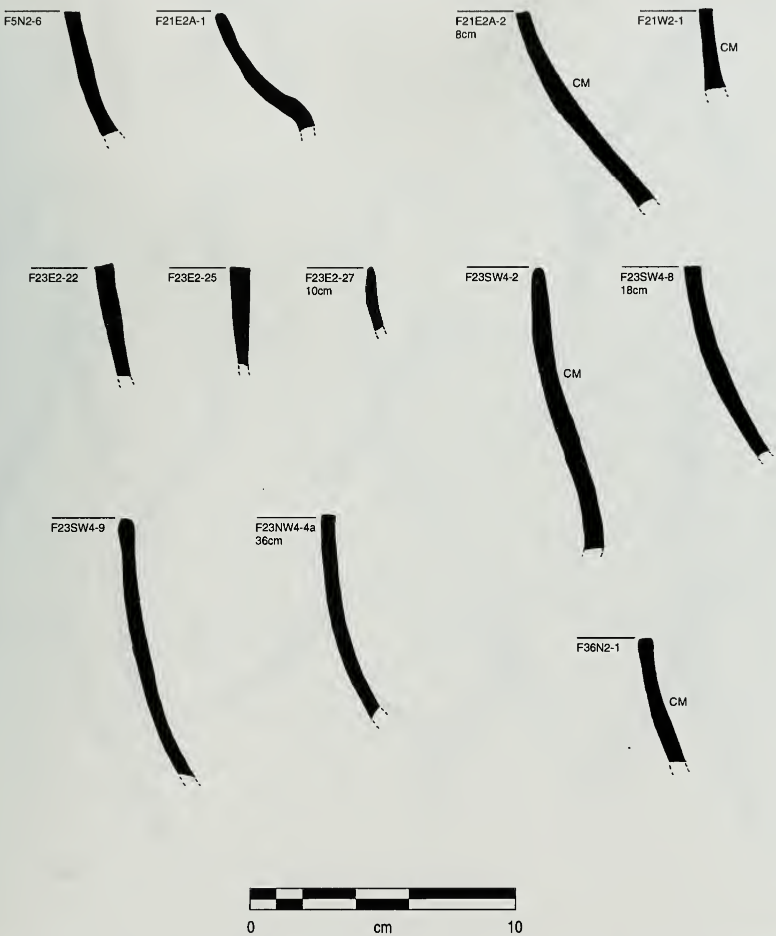
APPENDIX C.
RIM PROFILES
TYPE 3 BOWLS



APPENDIX C.
RIM PROFILES
TYPE 1 JARS



APPENDIX C.
RIM PROFILES
TYPE 3 JARS



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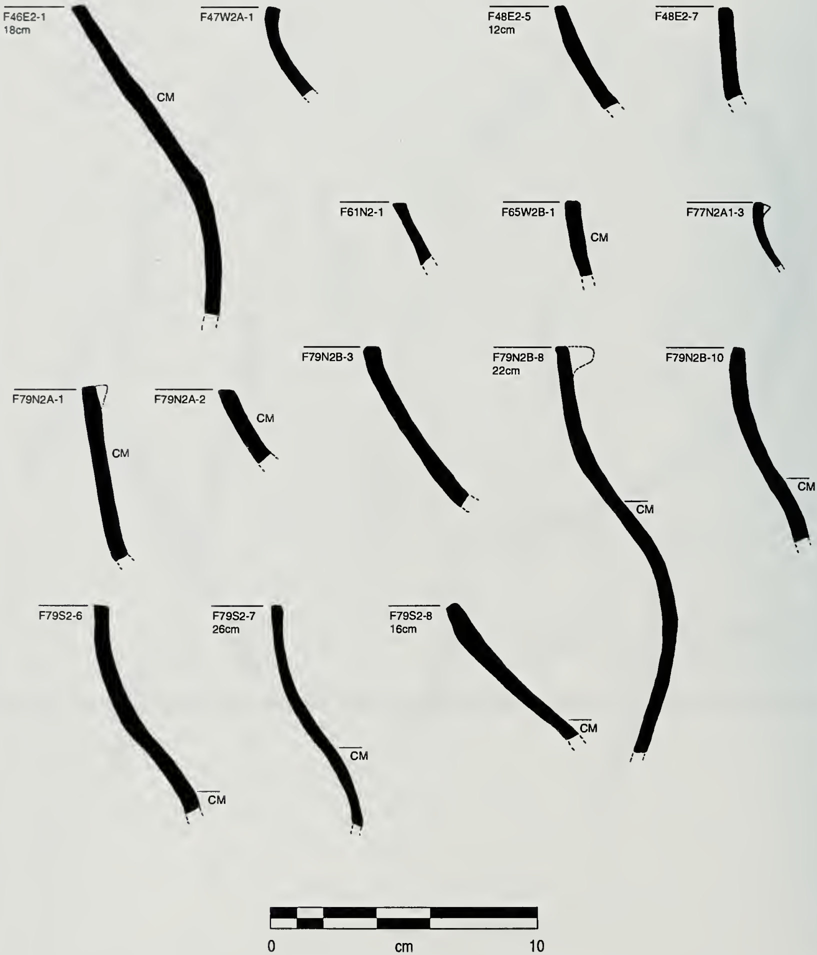
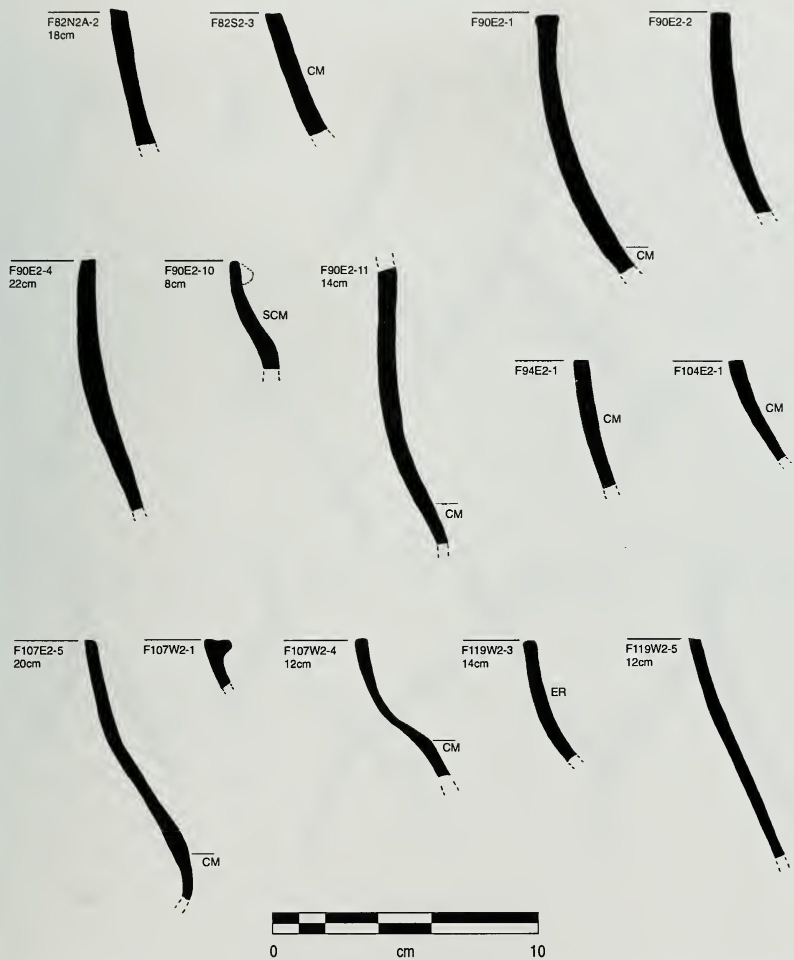
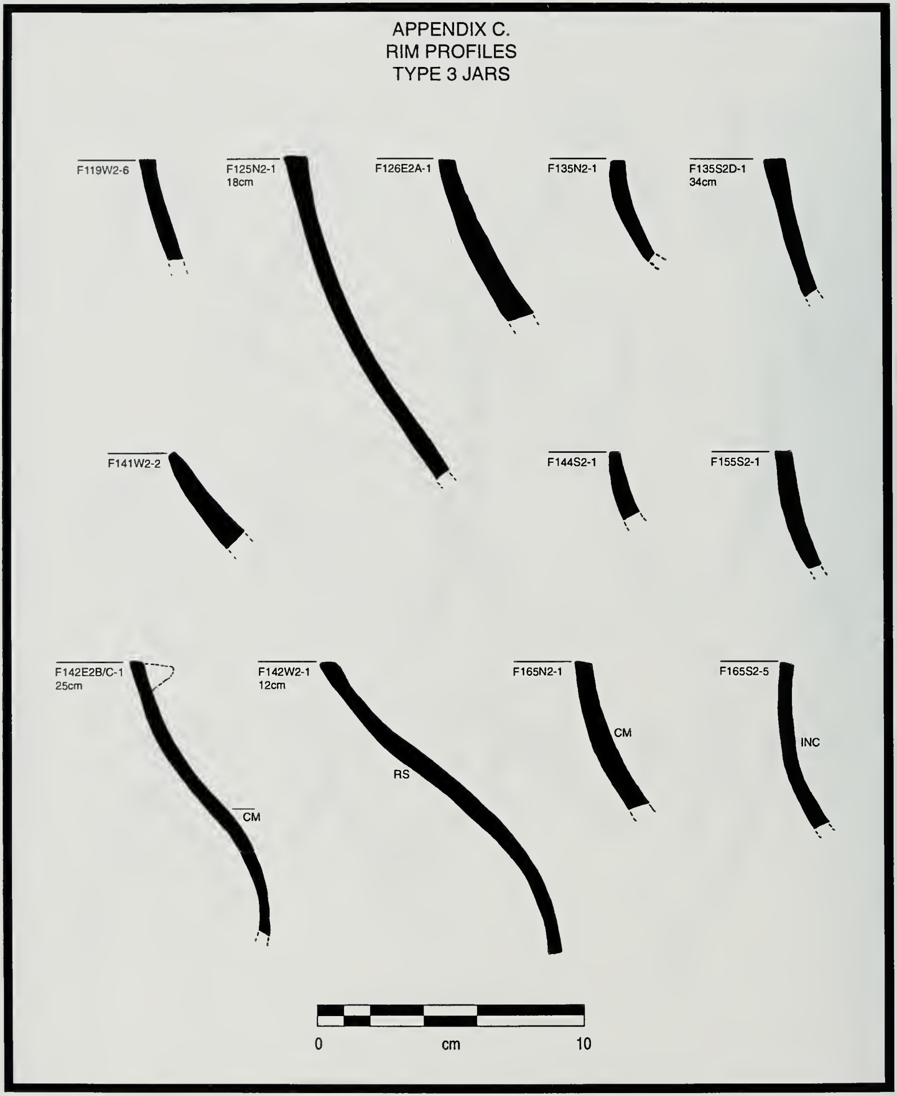
RIM PROFILES
TYPE 3 JARS

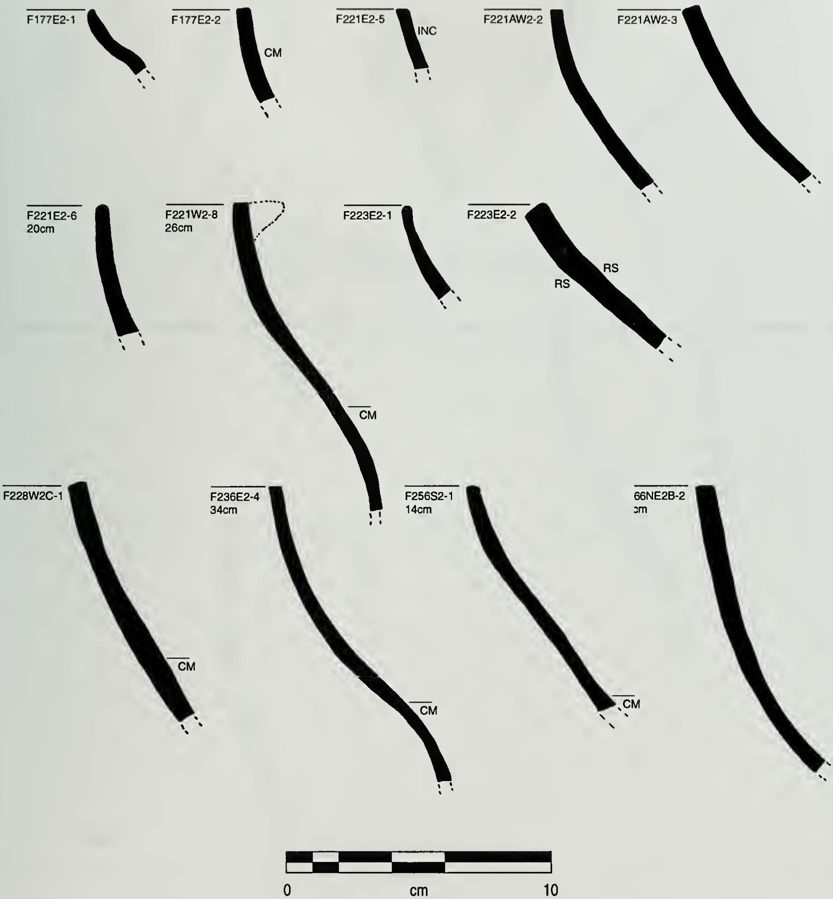


APPENDIX C.
RIM PROFILES
TYPE 3 JARS

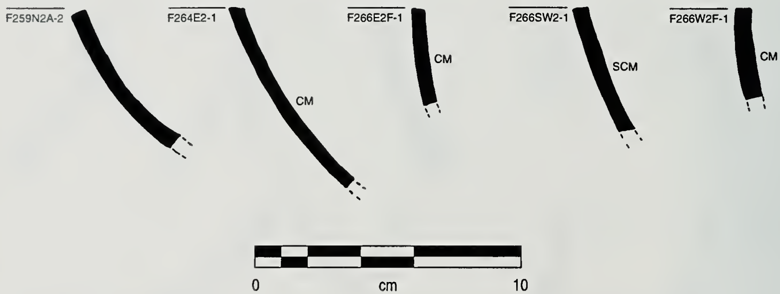



APPENDIX C.
RIM PROFILES
TYPE 3 JARS
F119W2-6
F125N2-1
18cm
F126E2A-1
F135N2-1
F135S2D-1
34cm
F141W2-2
F144S2-1
F155S2-1
F142E2B/C-1
25cm
CM
F142W2-1
12cm
RS
F165N2-1
CM
F165S2-5
INC
0
cm
10

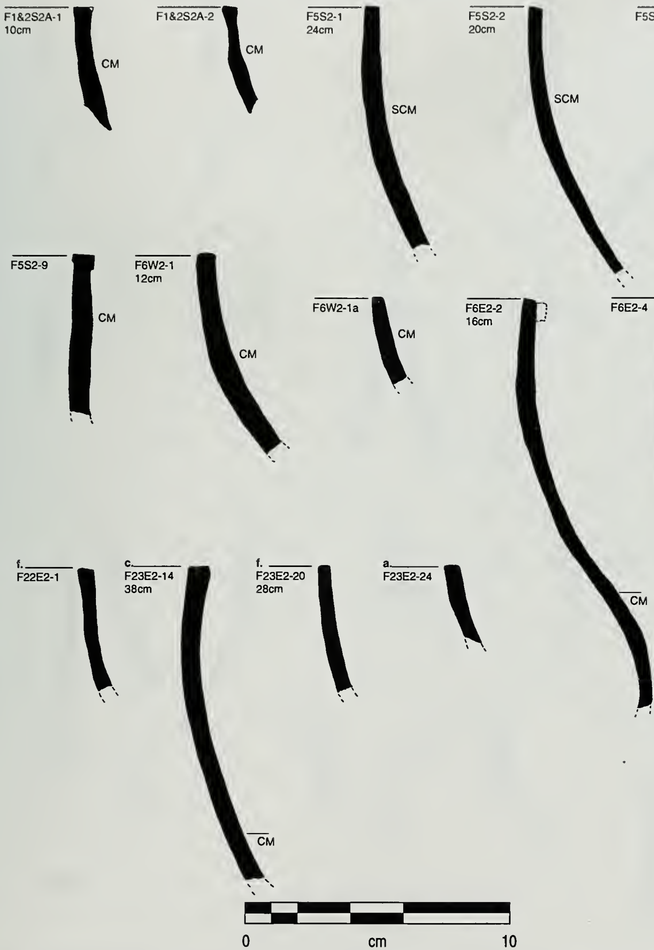
APPENDIX C.
RIM PROFILES
TYPE 3 JARS



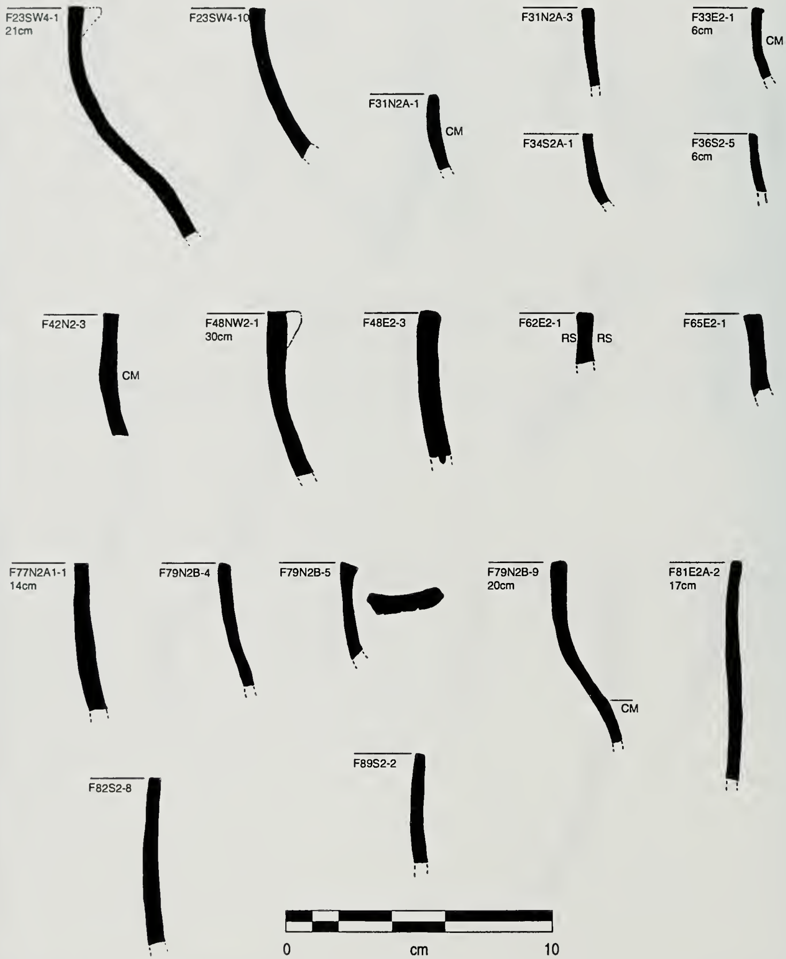
APPENDIX C.
RIM PROFILES
TYPE 3 JARS



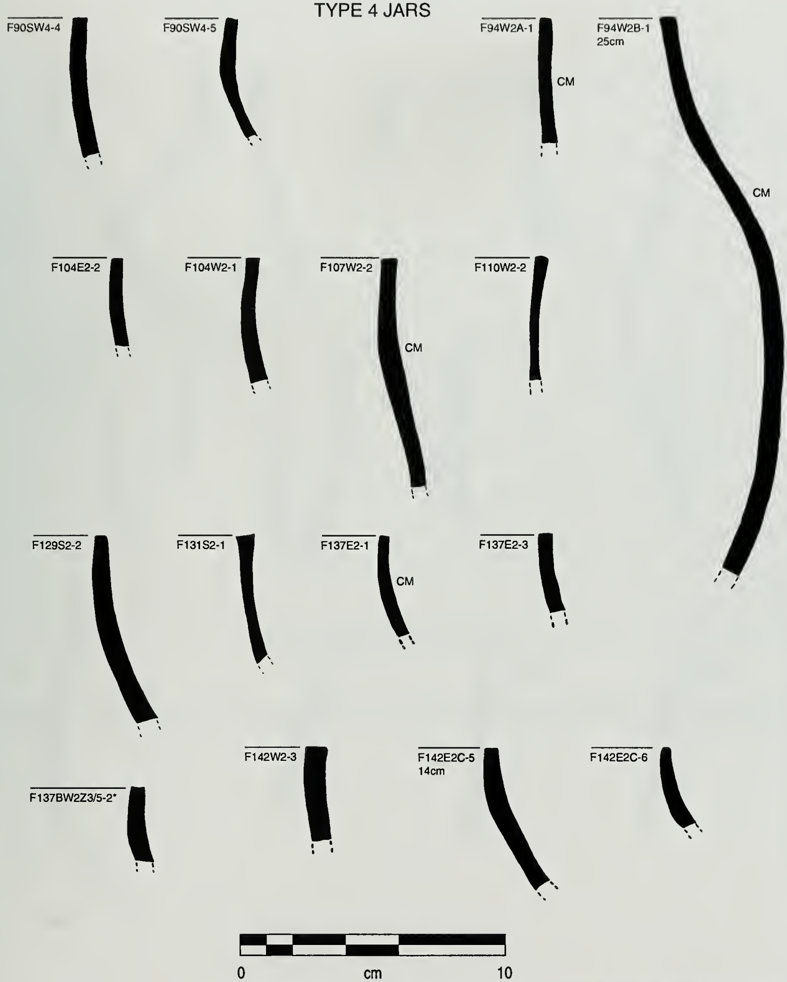
APPENDIX C.
RIM PROFILES
TYPE 4 JARS



APPENDIX C.
RIM PROFILES
TYPE 4 JARS

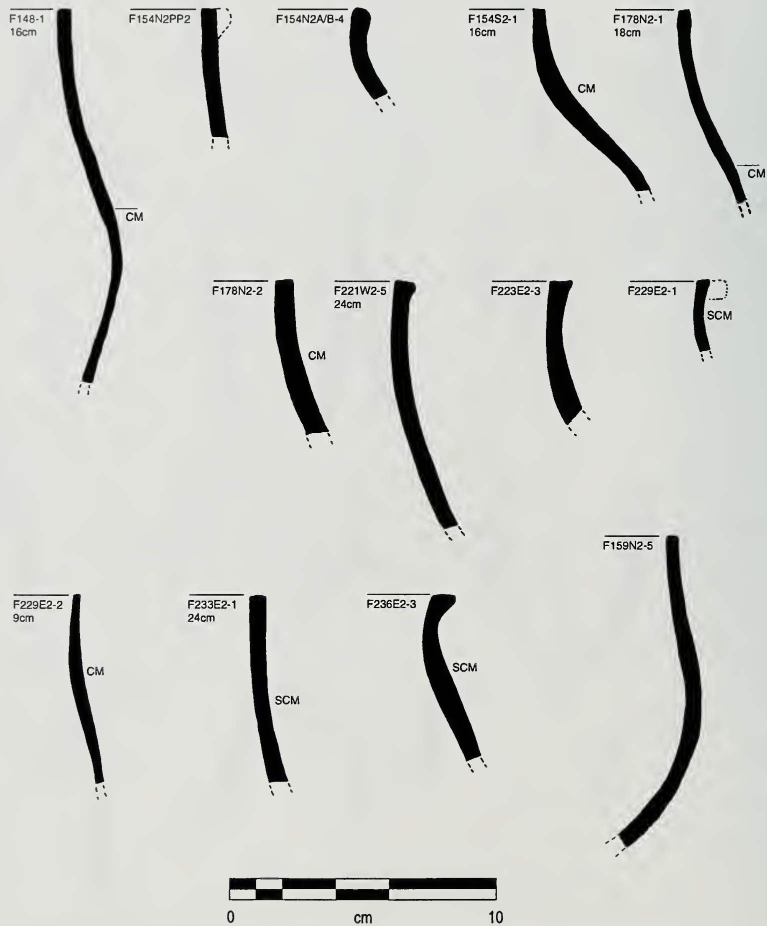


APPENDIX C.
RIM PROFILES
TYPE 4 JARS

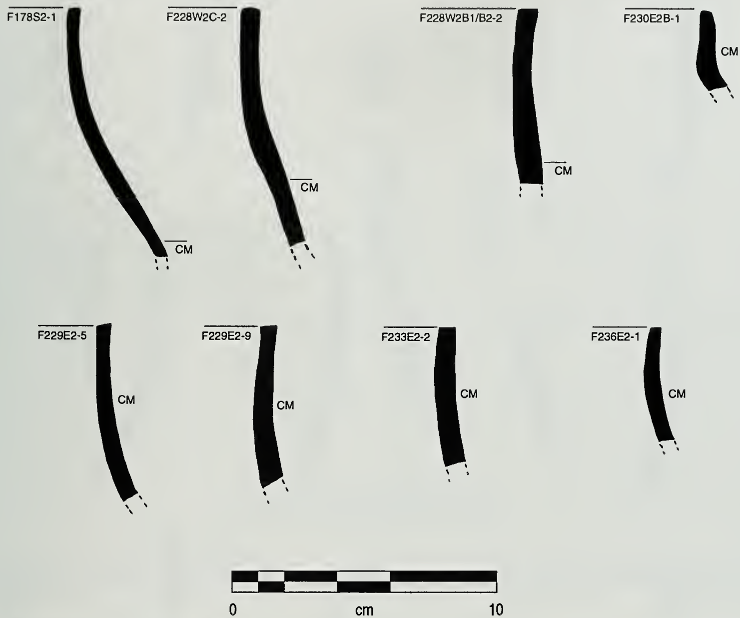


*Feature 137B, West Half, Zones 3-5, Number 2

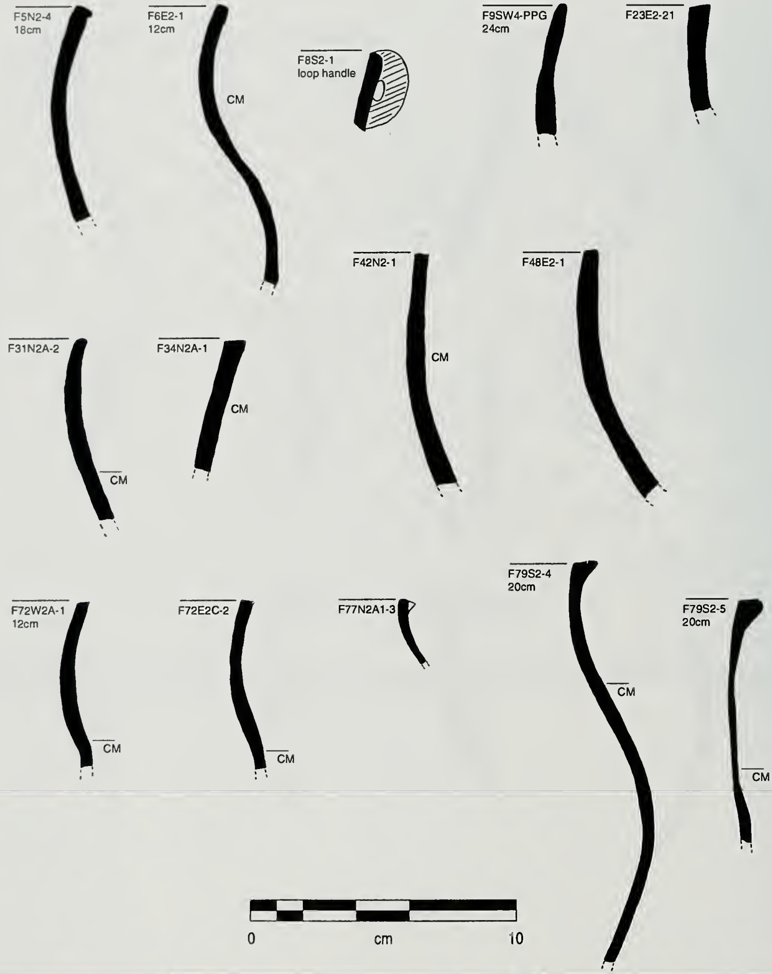
APPENDIX C.
RIM PROFILES
TYPE 4 JARS



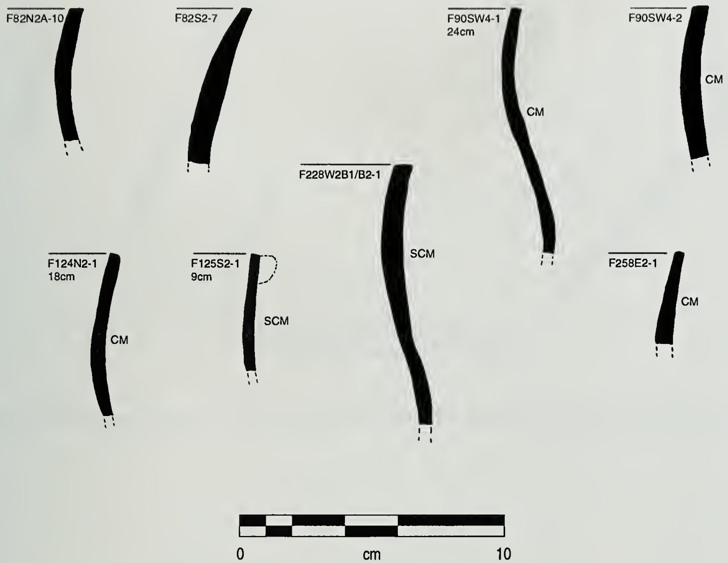
APPENDIX C.
RIM PROFILES
TYPE 4 JARS



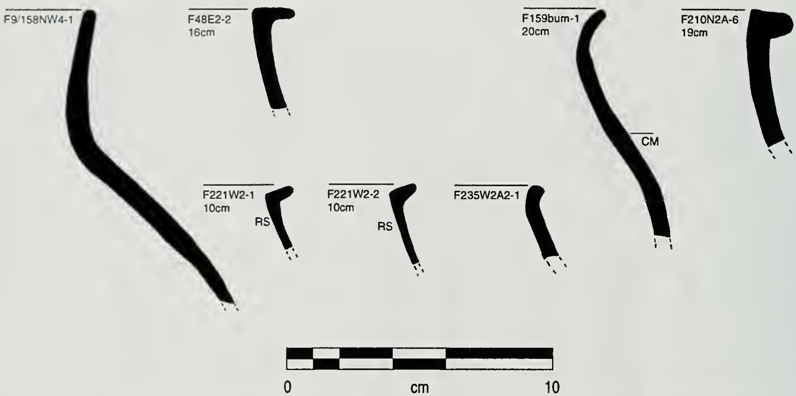
APPENDIX C.
RIM PROFILES
TYPE 5 JARS



APPENDIX C.
RIM PROFILES
TYPE 5 JARS



APPENDIX C.
RIM PROFILES
TYPE 6 JARS



APPENDIX D.

LITHIC ATTRIBUTES

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.1/2#	F.1/2 Wt.	F.3#	F.3 Wt.	F.4#	F.4 Wt.	F.5#	F.5 Wt.	F.6#	F.6 Wt.
Rough Biface	1	11.4	0	0.0	0	0.0	0	0.0	1	104.4
Thick Biface	0	0.0	0	0.0	0	0.0	1	20.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	1	0.0	0	0.0	0	0.0	1	1.8	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL TOOLS	**2**	**11.4**	**0**	**0.0**	**0**	**0.0**	**2**	**21.8**	**1**	**104.4**
CHERT CORES										
P/C Core		0.0	0	0.0	1	36.4	0	0.0	0	0.0
M/D Core	2	64.6	0	0.0	0	0.0	0	0.0	3	241.2
Bipolar Core	3	151.0	0	0.0	1	42.9	13	478.2	11	514.5
TOTAL CORES	**5**	**215.6**	**0**	**0.0**	**2**	**79.3**	**13**	**478.2**	**14**	**755.7**
DEBITAGE										
Primary Flake	37	125.3	0	0.0	4	23.1	60	219.6	33	208.7
Second. Flake	35	129.6	0	0.0	5	15.6	36	185.3	48	221.0
Tertiary Flake	72	77.5	1	8.3	4	4.1	94	349.6	77	97.0
Biface Thin. Flk.	7	5.9	0	0.0	0	0.0	8	7.7	3	3.6
Bipolar Flake	10	33.1	0	0.0	3	6.0	50	101.0	82	77.3
Broken Flake	78	63.4	0	0.0	3	1.0	89	145.2	159	196.7
Blade	0	0.0	0	0.0	0	0.0	2	14.2	4	28.5
Shatter	94	351.0	3	68.7	0	0.0	129	1482.2	175	1092.6
Hoe Flake	1	1.2	0	0.0	0	0.0	5	842.5	2	6.3
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**334**	**787.0**	**4**	**77.0**	**19**	**49.8**	**473**	**3347.3**	**583**	**1931.7**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	1	88.7	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	1	115.5	0	0.0	0	0.0	1	233.4	3	401.4
Celt	0	0.0	0	0.0	0	0.0	0	0.0	1	67.2
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	1	0.4	0	0.0
Limestone	62	2507.0	11	282.9	13	339.5	0	7775.5	152	3556.2
FCR	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pebbles	0	0.0	0	0.0	0	0.0	5	2.8	1	1.3
Sandstone	0	0.0	0	0.0	0	0.0	4	96.8	8	97.6
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	19	22.2
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch	**63**	**2622.5**	**11**	**282.9**	**13**	**339.5**	**12**	**8197.6**	**184**	**4145.9**

CHERT TOOLS	F.7#	F.7 Wt.	F.8#	F.8 Wt.	F.9#	F.9 Wt.	F.10/157#	F.10/157Wt	F.15#	F.15 Wt.
Rough Biface	0	0.0	1	47.5	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	2	10.4	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	1	1.5
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	1	19.5	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0.0**	**1**	**47.5**	**3**	**29.9**	**0**	**0.0**	**1**	**1.5**
CHERT CORES										
P/C Core	0	0.0	0	0.0	1	250.1	0	0.0	0	0.0
M/D Core	0	0.0	1	15.8	1	22.1	1	4.7	1	66.1
Bipolar Core	0	0.0	2	27.2	4	208.9	1	3.6	1	17.1
Total Cores	**0**	**0.0**	**3**	**43.0**	**6**	**481.1**	**2**	**8.3**	**2**	**83.2**
DEBITAGE										
Primary Flake	1	3.7	20	94.5	17	49.8	15	61.5	15	66.2
Second. Flake	2	7.7	16	60.3	19	53.7	19	224.9	11	31.4
Tertiary Flake	2	2.3	18	19.9	72	234.4	76	261.3	20	37.6
Biface Thin. Flk.	0	0.0	0	0.0	5	1.8	3	1.8	0	0.0
Bipolar Flake	2	1.8	14	15.4	9	9.4	7	27.6	5	2.5
Broken Flake	3	1.1	34	65.7	113	148.7	82	118.7	16	14.7
Blade	1	19.9	1	16.4	9	37.6	3	15.3	0	0.0
Shatter	13	9.3	51	333.3	142	251.2	41	153.6	43	119.0
Hoe Flake	0	0.0	0	0.0	1	0.3	0	0.0	1	0.3
Nodules	0	0.0	0	0.0	1	56.8	0	0.0	1	31.8
TOTAL DEBITAGE	**24**	**45.8**	**154**	**605.5**	**388**	**843.7**	**246**	**864.7**	**112**	**303.5**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	1	296.5	0	0.0	1	90.7
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	1	0.4	0	0.0	2	5.4
Limestone	0	0.0	102	1568.1	18	1512.6	96	1304.8	99	405.7
FCR	0	0.0	0	0.0	4	171.2	0	0.0	3	79.4
Pebbles	0	0.0	3	3.1	6	3.8	0	0.0	1	10.1
Sandstone	0	0.0	0	0.0	2	365.8	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	1	0.3	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	5	42.5	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	1	90.2
Total Non-Ch.	**0**	**0.0**	**0**	**1571.2**	**33**	**2350.6**	**101**	**1347.3**	**107**	**681.5**

CHERT TOOLS	F.16#	F.16 Wt.	F.17#	F.17 Wt.	F.19#	F.19 Wt.	F.20#	F.20 Wt.
Rough Biface	0	0.0	0	0.0	0	0.0	1	17.9
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**1**	**17.9**
CHERT CORES								
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	2	146.9	0	0.0	0	0.0	0	0.0
Bipolar Core	2	9.5	0	0.0	0	0.0	3	23.7
Total Cores	**4**	**156.4**	**0**	**0.0**	**0**	**0.0**	**3**	**23.7**
DEBITAGE								
Primary Flake	3	12.8	0	0.0	0	0.0	29	134.4
Second. Flake	4	6.1	0	0.0	0	0.0	56	194.5
Tertiary Flake	3	0.9	0	0.0	0	0.0	83	120.7
Biface Thin. Flk.	2	3.6	0	0.0	0	0.0	7	4.1
Bipolar Flake	5	10.4	0	0.0	0	0.0	26	22.3
Broken Flake	8	3.7	1	0.3	0	0.0	96	115.7
Blade	1	0.5	0	0.0	0	0.0	18	29.3
Shatter	22	13.1	1	0.5	8	1.3	92	433.9
Hoe Flake	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**48**	**51.1**	**2**	**0.8**	**0**	**0.0**	**407**	**1054.9**
NON-CHERT								
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	1	5.5
Limestone	27	1076.3	21	209.7	0	0.0	25	18834.1
FCR	0	0.0	0	0.0	0	0.0	2	2.5
Pebbles	0	0.0	0	0.0	0	0.0	0	0.0
Sandstone	0	0.0	0	0.0	0	0.0	8	488.9
Igneous	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**27**	**1076.3**	**21**	**209.7**	**0**	**0.0**	**36**	**19331**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.21#	F.21 Wt.	F.22#	F.22 Wt.	F.23#	F.23 Wt.	F.27#	F.27 Wt.	F.31#	F.31 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	1	6.4	0	0.0	3	26.6	0	0.0	0	0.0
Thin Biface	2	5.5	0	0.0	2	3.1	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	1	6.0	0	0.0	0	0.0
Ret. Flake	1	3.0	0	0.0	2	30.8	1	2.1	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	1	2.8	0	0.0	2	39.7	0	0.0	0	0.0
Hoe	1	70.9	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	2	9.2	0	0.0	1	24.7	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	2	14.3	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**10**	**112.1**	**0**	**0.0**	**11**	**130.9**	**1**	**2.1**	**0**	**0.0**
CHERT CORES										
P/C Core	0	0.0	0	0.0	1	39.4	0	0.0	0	0.0
M/D Core	2	87.4	1	57.0	17	1210.6	0	0.0	3	164.5
Bipolar Core	4	101.5	4	102.0	19	1332.5	0	0.0	2	46.2
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**6**	**188.9**	**5**	**159.0**	**37**	**2582.5**	**0**	**0.0**	**5**	**210.7**
DEBITAGE										
Primary Flake	28	142.3	8	52.9	115	597.9	2	1.3	6	2.8
Second. Flake	56	360.1	16	41.5	207	1010.6	4	29.2	11	15.5
Tertiary Flake	125	201.8	31	78.1	221	608.7	3	6.9	12	3.6
Biface Thin. Flk.	22	11.0	2	0.7	23	33.1	0	0.0	3	2.9
Bipolar Flake	46	115.9	7	7.7	134	337.0	6	23.9	15	17.0
Broken Flake	146	85.7	42	40.5	301	316.9	18	7.2	27	18.9
Blade	7	3.5	1	0.2	14	76.3	0	0.0	0	0.0
Shatter	224	715.0	75	282.8	746	4499.9	19	38.8	32	83.4
Hoe Flake	2	1.0	0	0.0	3	3.3	0	0.0	0	0.0
Nodules	2	578.2	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	1	6.3	0	0.0	0	0.0
Total Debitage	**658**	**2214.5**	**182**	**504.4**	**1765**	**7490.0**	**52**	**107.3**	**106**	**144.1**
NON-CHERT										
Hammerstone	1	242.2	0	0.0	1	188.8	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	1	6.0	1	562.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	3	324.5	0	0.0	0	0.0
Celt	0	0.0	0	0.0	4	6.8	0	0.0	0	0.0
Abrader	1	78.6	0	0.0	1	29.3	0	0.0	0	0.0
Hematite	1	0.2	0	0.0	5	22.0	0	0.0	0	0.0
Limestone	173	2782.9	38	373.8	1366	69755.2	3	2.0	23	147.4
FCR	13	105.3	0	0.0	13	38.6	0	0.0	0	0.0
Pebbles	6	9.1	3	3.2	3	1.7	1	1.0	2	1.8
Sandstone	5	40.6	1	6.7	18	120.5	0	0.0	2	2.7
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	1	351.0	0	0.0	11	496.1	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	1	15.7	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	1	27.4	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**204**	**3659.0**	**43**	**945.7**	**1425**	**70983.5**	**4**	**3.0**	**27**	**151.9**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.33#	F.33 Wt.	F.34#	F.34 Wt.	F.35#	F.35 Wt.	F.36#	F.36 Wt.	F.38#	F.38 Wt.
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	1	4.7	0	0.0	0	0.0	2	9.8
Thin Biface	0	0.0	0	0.0	0	0.0	5	6.3	0	0.0
End Scraper	0	0.0	1	12.5	0	0.0	2	34.7	0	0.0
Ret. Flake	1	29.4	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	1	7.6	0	0.0	0	0.0	1	6.0	2	29.7
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	2	0.8	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	2	13.7	0	0.0
Total Tools	**2**	**37.0**	**2**	**17.2**	**0**	**0.0**	**12**	**61.5**	**4**	**39.5**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	2	81.4	0	0.0	3	212.3	13	1042.1
Bipolar Core	3	245.8	1	34.5	0	0.0	13	806.0	25	812.4
Unidirectional	0	0.0	0	0.0	0	0.0	1	15.8	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	1	14.3	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	2	10.6
Total Cores	**3**	**245.8**	**3**	**115.9**	**0**	**0.0**	**18**	**1048.4**	**40**	**1865.1**
DEBITAGE										
Primary Flake	10	86.0	16	48.9	1	42.0	55	317.6	40	182.1
Second. Flake	25	195.4	18	21.7	0	0.0	121	560.4	158	612.9
Tertiary Flake	25	79.0	32	35.8	0	0.0	138	163.0	67	95.4
Biface Thin. Flk.	4	5.6	10	8.3	2	0.5	14	13.4	11	25.4
Bipolar Flake	25	79.8	8	18.0	0	0.0	89	361.8	44	76.8
Broken Flake	92	141.4	86	117.4	0	0.0	169	195.0	206	247.2
Blade	0	0.0	1	0.5	0	0.0	7	11.0	2	4.5
Shatter	261	910.1	159	373.9	2	1.4	274	2078.6	332	684.6
Hoe Flake	0	0.0	0	0.0	0	0.0	5	15.7	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	1	29.2
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**442**	**1497.3**	**330**	**624.5**	**5**	**43.9**	**872**	**3716.5**	**861**	**1958.1**
NON-CHERT										
Hammerstone	1	170.1	0	0.0	0	0.0	2	734.5	1	286.2
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	1	13.9	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	1	2.1
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	1	3.6
Hematite	1	3.6	8	28.6	0	0.0	1	3.0	13	26.5
Limestone	58	9010.7	48	164.7	0	0.0	148	4420.1	46	2311.5
FCR	0	0.0	3	18.6	0	0.0	5	27.8	0	0.0
Pebbles	8	15.5	2	5.0	0	0.0	16	16.7	2	8.0
Sandstone	2	26.4	5	3.1	0	0.0	7	5.2	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	3	873.3	0	0.0
Granite	1	0.3	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	1	362.2	0	0.0	0	0.0	0	0.0	1	72.4
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**72**	**9588.8**	**67**	**233.9**	**0**	**0.0**	**182**	**6080.6**	**65**	**2710.3**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.40#	F.40 Wt.	F.41#	F.41 Wt.	F.42#	F.42 Wt.	F.43#	F.43 Wt.	F.44#	F.44 Wt.
Rough Biface	0	0.0	0	0.0	1	51.7	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	2	4.7	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	2	26.5	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	4	12.1	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	1	15.8	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**9**	**59.1**	**0**	**0.0**	**1**	**51.7**	**0**	**0.0**	**0**	**0.0**
CHERT CORES										
P/C Core	1	33.8	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	11	496.7	0	0.0	1	107.9	0	0.0	0	0.0
Bipolar Core	4	184.3	0	0.0	21	985.1	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**16**	**714.8**	**0**	**0.0**	**22**	**1093.0**	**0**	**0.0**	**0**	**0.0**
DEBITAGE										
Primary Flake	64	268.0	0	0.0	16	24.4	3	31.5	0	0.0
Second. Flake	105	330.4	1	0.2	20	218.0	10	17.4	0	0.0
Tertiary Flake	90	136.6	3	7.5	43	143.6	0	0.0	0	0.0
Biface Thin. Flk.	4	8.0	0	0.0	6	9.7	0	0.0	0	0.0
Bipolar Flake	14	54.6	3	12.4	8	146.1	0	0.0	0	0.0
Broken Flake	87	108.5	5	1.9	34	30.8	13	16.3	0	0.0
Blade	2	7.4	1	1.0	2	0.7	0	0.0	0	0.0
Shatter	258	757.5	9	23.6	134	1410.8	9	15.3	3	28.7
Hoe Flake	2	5.8	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	1	192.6	0	0.0	4	774.9	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**627**	**1869.4**	**22**	**46.6**	**267**	**2759.0**	**35**	**80.5**	**3**	**28.7**
NON-CHERT										
Hammerstone	3	486.4	0	0.0	2	276.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	1	863.4	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	2	244.8	0	0.0	0	0.0
Celt	1	38.7	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	4	286.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	2	3.0	0	0.0	0	0.0	2	35.5	0	0.0
Limestone	115	700.0	0	0.0	172	5500.0	10	5.5	0	0.0
FCR	1	6.6	0	0.0	0	0.0	0	0.0	0	0.0
Pebbles	2	1.1	0	0.0	0	0.0	0	0.0	0	0.0
Sandstone	1	1.6	0	0.0	1	127.0	1	336.1	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	2	0.8	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	1	246.5	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**130**	**1769.9**	**1**	**863.4**	**179**	**6148.6**	**13**	**377.1**	**0**	**0.0**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.45#	F.45 Wt.	F.46#	F.46 Wt.	F.47#	F.47 Wt.	F.48#	F.48 Wt.	F.49#	F.49 Wt.
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	1	11.9	0	0.0	0	0.0	1	9.3	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	1	6.1	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	2	4.9	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	1	1.8	1	6.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	1	71.7
Total Tools	**1**	**11.9**	**0**	**0.0**	**3**	**6.7**	**3**	**21.4**	**1**	**71.7**
CHERT CORES										
P/C Core	0	0.0	1	18.3	0	0.0	1	10.4	0	0.0
M/D Core	0	0.0	1	133.7	8	1839.8	7	995.1	0	0.0
Bipolar Core	0	0.0	1	10.5	7	688.8	14	1073.0	1	7.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**0**	**0.0**	**3**	**162.5**	**15**	**2528.6**	**22**	**2078.5**	**1**	**7.0**
DEBITAGE										
Primary Flake	7	14.7	6	22.7	27	48.4	34	160.7	17	50.4
Second. Flake	7	4.6	35	133.3	50	153.7	75	372.4	17	48.7
Tertiary Flake	2	10.1	18	9.4	71	125.1	69	221.7	15	10.6
Biface Thin. Flk.	3	5.0	3	1.3	7	24.2	22	64.0	17	28.5
Bipolar Flake	1	0.8	25	51.2	8	16.6	53	310.3	3	1.3
Broken Flake	16	9.5	82	74.0	112	88.7	146	308.7	61	78.0
Blade	0	0.0	1	1.1	1	0.3	8	43.3	1	11.8
Shatter	18	33.4	88	285.6	157	577.8	234	3033.5	74	290.7
Hoe Flake	0	0.0	1	0.5	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	5	1193.9	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**54**	**78.1**	**259**	**579.1**	**438**	**2228.7**	**641**	**4514.6**	**205**	**520**
NON-CHERT										
Hammerstone	0	0.0	1	76.6	2	401.1	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	3	19.4
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	1	80.1	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	1	8.6	1	9.8	0	0.0
Limestone	2	0.7	9	19.0	56	6409.2	117	4617.7	26	62.9
FCR	2	0.7	3	36.0	2	66.2	7	40.1	8	593.2
Pebbles	0	0.0	3	2.2	7	3.0	1	2.0	2	2.8
Sandstone	3	618.3	0	0.0	5	449.6	6	136.2	16	149.2
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	6	2299.9	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	1	0.6	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	2	1335.8	0	0.0
Total Non-Ch.	7	619.7	16	133.8	75	450.2	140	8441.5	55	827.5

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.49A	F.49AWt	F.51#	F.51 Wt.	F.55#	F.55 Wt.	F.56#	F.56 Wt.	F.57#	F.57 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	1	6.2	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	0	0.0	0	0.0	1	6.2	0	0.0	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
DEBITAGE										
Primary Flake	1	3.6	0	0.0	2	8.0	1	0.9	0	0.0
Second. Flake	1	0.2	0	0.0	3	23.6	2	7.8	1	0.3
Tertiary Flake	0	0.0	0	0.0	3	7.3	1	2.7	0	0.0
Biface Thin. Flk.	0	0.0	3	1.0	1	0.6	0	0.0	1	1.2
Bipolar Flake	1	1.6	0	0.0	3	3.0	0	0.0	0	0.0
Broken Flake	3	3.0	5	5.0	12	18.5	1	2.3	2	1.9
Blade	0	0.0	1	0.7	0	0.0	0	0.0	0	0.0
Shatter	9	99.7	4	8.4	29	177.3	0	0.0	2	15.1
Hoe Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	15	108.1	13	15.1	53	238.3	5	13.7	6	18.5
NON-CHERT										
Hammerstone	0	0.0	0	0.0	1	127.7	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Limestone	7	61.8	2	0.7	58	2575.9	7	64.2	0	0.0
FCR	0	0.0	1	0.8	1	1.0	0	0.0	0	0.0
Pebbles	0	0.0	0	0.0	0	0.0	0	0.0	1	1.3
Sandstone	1	7.8	0	0.0	0	0.0	1	152.7	0	0.0
Igneous	0	0.0	0	0.0	1	12.1	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	1	1037.1	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0 0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	8	69.6	3	1.5	62	3753.8	8	216.9	1	1.3

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.59#	F.59 Wt.	F.60#	F.60 Wt.	F.61#	F.61 Wt.	F.62#	F.62 Wt.	F.63#	F.63 Wt.
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	1	22.8	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	2	34.9	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	2	4.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	1	35.4	0	0.0	0	0.0
Total Tools	0	0.0	0	0.0	6	97.1	0	0.0	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	6	417.5	1	12.5	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	0	0	0	**0**	6	**417.5**	**1**	**12.5**	0	0
DEBITAGE										
Primary Flake	0	0.0	0	0.0	32	76.7	2	2.5	0	0.0
Second. Flake	1	8.7	1	0.1	44	133.2	10	16.2	0	0.0
Tertiary Flake	0	0.0	0	0.0	50	37.0	9	5.4	1	5.1
Biface Thin. Flk.	0	0.0	3	4.8	8	5.5	1	5.3	0	0.0
Bipolar Flake	1	0.1	2	1.4	41	112.1	3	8.3	1	2.7
Broken Flake	0	0.0	6	1.3	131	246.4	17	22.2	4	4.9
Blade	0	0.0	0	0.0	8	40.0	3	4.3	0	0.0
Shatter	0	0.0	5	4.4	197	1035.9	20	72.3	2	333.8
Hoe Flake	0	0.0	0	0.0	3	2.1	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**2**	**8.8**	**17**	**12.0**	**514**	**1688.9**	**65**	**136.5**	**8**	**346.5**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	2	454.5	1	79.6	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	2	0.7	0	0.0	0	0.0
Limestone	11	496.2	2	0.7	67	2389.7	8	414.8	0	0.0
FCR	0	0.0	0	0.0	4	3.0	0	0.0	0	0.0
Pebbles	0	0.0	0	0.0	4	3.6	1	0.4	0	0.0
Sandstone	0	0.0	0	0.0	5	87.8	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**11**	**496.2**	**2**	**0.7**	**84**	**2939.3**	**10**	**494.8**	**0**	**0.0**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.64#	F.64 Wt.	F.65#	F.65 Wt	F.67#	F.67 Wt.	F.70#	F.70 Wt.	F.72#	F.72 Wt.
Rough Biface	0	0.0	0	0.0	0	0.0	1	63.1	0	0.0
Thick Biface	0	0.0	0	0.0	1	41.2	0	0.0	0	0.0
Thin Biface	1	1.8	0	0.0	0	0.0	1	5.6	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	1	8.2	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	1	3.8	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**3**	**13.8**	0	**0.0**	**1**	**41.2**	**2**	**68.7**	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	1	45.2	0	0.0
M/D Core	2	103.0	1	9.4	0	0.0	0	0.0	0	0.0
Bipolar Core	2	34.0	0	0.0	1	15.6	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	4	**137.0**	**1**	**9.4**	**1**	**15.6**	**1**	**45.2**	0	0.0
DEBITAGE										
Primary Flake	19	27.1	6	17.3	11	21.8	4	12.0	9	52.5
Second. Flake	43	138.9	12	49.1	26	75.3	11	126.9	20	110.3
Tertiary Flake	48	51.1	7	23.5	27	35.1	10	15.9	34	38.0
Biface Thin. Flk.	10	6.7	3	1.3	10	4.7	0	0.0	6	2.9
Bipolar Flake	44	74.2	9	17.9	14	26.8	9	27.7	25	47.4
Broken Flake	158	139.9	42	25.0	98	66.2	29	37.8	95	92.8
Blade	7	18.1	3	4.0	2	27.4	0	0.0	4	6.2
Shatter	162	476.4	84	411.9	136	219.4	24	84.8	114	661.6
Hoe Flake	2	4.5	1	0.3	1	1.1	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**493**	**936.9**	**167**	**550.3**	**325**	**477.8**	**87**	**305.1**	**307**	**1011.7**
NON-CHERT										
Hammerstone	0	0.0	1	299.6	0	0.0	1	109.8	2	625.9
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	1	943.8
Mano	0	0.0	0	0.0	1	6.2	0	0.0	1	15.8
Metate	0	0.0	0	0.0	1	20.1	0	0.0	1	51.2
Celt	1	0.8	0	0.0	1	71.9	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	2	2.4	1	1.0	0	0.0
Limestone	263	2482.6	94	2476.9	203	41103.1	21	116.9	117	3998.5
FCR	0	0.0	12	35.3	0	0.0	0	0.0	0	0.0
Pebbles	3	1.2	1	0.6	6	48.2	1	2.2	6	3.2
Sandstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	1	4.9	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	1	27.8	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**269**	**2517.3**	**108**	**2812.4**	**214**	**41251.9**	**24**	**229.9**	**128**	**5638.4**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.77#	F.77 Wt.	F.78#	F.78 Wt.	F.79#	F.79 Wt.	F.80#	F.80 Wt.	F.81#	F.81 Wt.
Rough Biface	0	0.0	0	0.0	2	62.0	0	18.0	0	0.0
Thick Biface	1	3.1	0	0.0	2	2.1	1	3.3	0	0.0
Thin Biface	0	0.0	0	0.0	2	3.2	1	0.0	0	0.0
End Scraper	1	2.4	0	0.0	1	24.4	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	4	8.3	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	1	0.6	0	0.0	4	22.2	1	16.2	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	2	16.0	0	0.0	0	0.0
Hammerstone	1	410.5	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	1	24.2	0	0.0
Total Tools	**4**	**416.6**	**0**	**0.0**	**17**	**138.2**	**4**	**61.7**	**0**	**0.0**
CHERT CORES										
P/C Core	1	45.1	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	1	9.8	0	0.0	4	190.4	4	186.9	0	0.0
Bipolar Core	2	34.1	0	0.0	16	1766.4	5	70.7	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**4**	**89.0**	**0**	**0.0**	**20**	**1956.8**	**9**	**257.6**	**0**	**0.0**
DEBITAGE										
Primary Flake	20	120.9	0	0.0	67	417.1	30	250.3	6	10.3
Second. Flake	51	214.7	0	0.0	147	723.1	40	137.5	14	67.3
Tertiary Flake	45	68.9	0	0.0	286	529.4	82	168.2	20	39.8
Biface Thin. Flk.	9	12.7	0	0.0	29	36.2	12	8.1	2	2.4
Bipolar Flake	29	129.2	0	0.0	121	481.8	29	83.6	9	68.6
Broken Flake	125	145.7	0	0.0	332	464.2	180	166.8	29	18.7
Blade	3	25.4	2	0.4	9	14.3	4	4.0	2	2.5
Shatter	131	878.7	0	0.0	403	2063.7	174	794.4	36	161.6
Hoe Flake	0	0.0	0	0.0	4	5.5	1	0.7	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**413**	**1596.2**	**2**	**0.4**	**1398**	**4735.3**	**552**	**1613.6**	**118**	**371.2**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	2	1020.3	1	126.3	1	397.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	1	586.7	0	0.0
Mano	0	0.0	0	0.0	2	88.6	0	0.0	0	0.0
Metate	0	0.0	0	0.0	1	32.8	0	0.0	1	110.0
Celt	0	0.0	0	0.0	0	0.0	1	267.0	0	0.0
Abrader	0	0.0	0	0.0	1	18.6	1	78.4	0	0.0
Hematite	1	1.8	1	0.2	9	2.9	0	0.0	2	1.6
Limestone	98	2343.1	0	0.0	375	35519.5	66	4307.7	23	582.6
FCR	3	11.0	0	0.0	21	551.7	1	2.1	0	0.0
Pebbles	3	1.4	0	0.0	24	34.0	0	0.0	1	0.5
Sandstone	0	0.0	0	0.0	8	127.2	1	1.0	0	0.0
Igneous	0	0.0	0	0.0	1	1.6	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	1	272.6	0	0.0	0	0.0
Worked Limest	0	0.0	0	0.0	1	157.9	1	427.7	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Limestone Hoe	0	0.0	0	0.0	0	0.0	1	2000.0	0	0.0
Total Non-Ch.	**105**	**2357.3**	**1**	**0.2**	**446**	**37827.7**	**74**	**7796.9**	**28**	**1091.7**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F100#	F.100 Wt	F102#	F.102 Wt	F103#	F103 Wt	F104#	F104 Wt	F105#	F105 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	1	3.3	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	1	1.6	1	20.8	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL TOOLS	**0**	**0.0**	**0**	**0.0**	**1**	**1.6**	**2**	**24.1**	**0**	**0.0**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**
DEBITAGE										
Primary Flake	0	0.0	4	20.1	1	1.2	4	28.7	4	10.2
Second. Flake	0	0.0	7	37.7	2	7.0	9	45.3	2	7.9
Tertiary Flake	0	0.0	10	10.6	7	22.2	11	18.1	3	2.3
Biface Thin. Flk.	0	0.0	5	2.7	0	0.0	1	3.3	1	1.9
Bipolar Flake	1	9.5	14	68.6	5	11.6	11	49.8	6	2.8
Broken Flake	0	0.0	26	23.5	10	32.2	14	21.2	11	7.0
Blade	0	0.0	2	11.1	0	0.0	0	0.0	1	0.7
Shatter	0	0.0	21	29.6	26	70.3	15	153.0	17	225.3
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**1**	**9.5**	**89**	**203.9**	**51**	**144.5**	**65**	**319.4**	**45**	**258.1**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	1	440.9
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Limestone	0	0.0	26	524.1	26	477.3	58	2036.7	30	746.2
FCR	0	0.0	0	0.0	4	18.0	0	0.0	2	26.3
Pebbles	0	0.0	3	8.1	0	0.0	1	0.5	0	0.0
Sandstone	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1
Igneous	0	0.0	0	0.0	0	0.0	1	3.1	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	1	28.3	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	1	27.9	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**0**	**0.0**	**29**	**532.2**	**30**	**495.3**	**62**	**2096.5**	**34**	**1213.5**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F106	F 106 Wt	F107	F 107 Wt	F108	108 Wt	F109	F 109 Wt	F110	F 110 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	1	14.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	1	3.9	0	0.0	1	3.4	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	1	101.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	0	0.0	1	3.9	0	0.0	1	3.4	2	115.0
CHERT CORES										
P/C Core	0	0.0	1	55.1	1	60.1	0	0.0	0	0.0
M/D Core	0	0.0	10	870.5	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	17	1010.3	0	0.0	0	0.0	1	6.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	0	0.0	28	1935.9	1	60.1	0	0.0	1	6.0
DEBITAGE										
Primary Flake	1	0.9	42	300.2	2	1.0	8	7.0	24	95.5
Second. Flake	1	2.9	58	531.2	8	36.4	18	103.4	47	173.0
Tertiary Flake	0	0.0	120	162.5	12	12.8	25	64.4	94	86.9
Biface Thin. Flk.	0	0.0	9	6.6	2	0.9	2	0.8	27	22.6
Bipolar Flake	1	0.1	22	276.6	2	110.7	0	0.0	13	19.0
Broken Flake	6	5.4	111	101.7	5	2.0	38	30.3	283	147.9
Blade	0	0.0	3	4.3	0	0.0	7	27.4	11	12.9
Shatter	0	0.0	234	1691.1	15	64.1	44	133.9	254	740.8
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	9	9.3	599	3074.2	46	227.9	142	367.2	753	1298.6
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	1	18.4	0	0.0
Metate	0	0.0	0	0.0	0	0.0	1	79.7	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	2	2.1	0	0.0	5	5.1	0	0.0
Limestone	12	655.9	172	7963.4	6	5.0	44	439.7	416	1886.5
FCR	0	0.0	9	482.7	5	22.4	0	0.0	4	95.4
Pebbles	0	0.0	10	8.0	1	0.7	0	0.0	4	10.3
Sandstone	0	0.0	2	5.3	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	1	75.1
Total Non Ch.	12	655.9	195	8461.5	12	28.1	51	542.9	425	2067.3

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F111	F 111 Wt	F113	F 113 Wt	F115	F 115 Wt	F116	F 116 Wt	F118	F 118 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	1	34.1	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	1	11.2	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	1	10.6	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	0	0.0	**2**	**21.8**	**1**	**34.1**	0	0.0	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	4	651.6	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	0	0.0	0	0.0	**4**	**651.6**	0	0.0	0	0.0
DEBITAGE										
Primary Flake	0	0.0	11	43.8	8	5.8	4	1.3	0	0.0
Second. Flake	3	15.8	15	87.4	7	6.8	0	0.0	3	6.2
Tertiary Flake	5	48.6	46	34.0	17	28.7	4	10.7	0	0.0
Biface Thin. Flk.	0	0.0	24	15.6	5	9.5	2	0.9	0	0.0
Bipolar Flake	1	6.6	9	8.9	5	2.2	4	19.1	0	0.0
Broken Flake	14	52.0	127	62.6	40	15.1	3	1.7	2	0.9
Blade	0	0.0	4	14.8	1	9.7	0	0.0	0	0.0
Shatter	10	33.8	114	431.2	22	175.8	4	16.0	3	3.4
Hoe flake	0	0.0	2	0.7	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**33**	**156.8**	**352**	**699.0**	**105**	**253.6**	**21**	**49.7**	**8**	**10.5**
NON-CHERT										
Hammerstone	0	0.0	1	300.2	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	1	938.1	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	1	87.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	6	3.1	0	0.0	0	0.0	0	0.0
Limestone	46	491.1	40	172.5	27	119.8	0	0.0	1	0.5
FCR	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pebbles	0	0.0	2	1.2	4	2.9	0	0.0	0	0.0
Sandstone	1	2.8	2	70.3	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	1	0.4	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	1	3.3	0	0.0	0	0.0	0	0.0
Total Non-ch.	**47**	**493.9**	**53**	**551.0**	**33**	**1147.8**	**0**	**0.0**	**1**	**0.5**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F119	F.119 Wt	F120	F.120 Wt	F122	F.122 Wt	F123	F.123 Wt	F124	F.124 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	1	1.1	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	2	5.1	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	1	2.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	11	36.7	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	1	1.7	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	16	46.6	0	0.0	0	0.0	0	0.0	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	1	23.8	0	0.0	3	66.5
Bipolar Core	14	549.3	3	111.8	2	17.8	0	0.0	2	89.2
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL CORES	14	549.3	3	111.8	3	41.6	0	0.0	5	155.7
DEBITAGE										
Primary Flake	50	151.1	2	9.3	9	42.0	1	1.3	3	11.8
Second. Flake	88	331.2	7	49.3	11	29.5	1	0.6	5	22.7
Tertiary Flake	118	225.1	8	2.9	26	20.0	4	1.5	23	19.2
Biface Thin. Flk.	14	22.2	0	0.0	6	3.3	0	0.0	5	1.3
Bipolar Flake	130	447.7	1	11.6	5	21.5	0	0.0	5	20.6
Broken Flake	226	387.7	14	8.3	45	15.3	2	0.2	25	19.1
Blade	4	6.7	0	0.0	0	0.0	1	6.2	0	0.0
Shatter	141	1219.4	56	141.2	96	348.1	5	233.9	45	183.7
Hoe flake	2	1.3	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	773	2792.4	88	222.6	198	479.7	14	243.7	111	278.4
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	7	280.8	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Limestone	190	1795.7	35	1409.1	33	1532.7	2	91.5	15	19306.3
FCR	3	149.3	10	84.0	4	41.9	0	0.0	2	47.4
Pebbles	0	0.0	2	1.4	0	0.0	0	0.0	2	2.2
Sandstone	7	9.4	2	2.3	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	1	36.7
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	1	841.5	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	1	216.1
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	207	2235.2	50	2338.3	37	1574.6	2	91.5	21	19608.7

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F125	F.125 Wt	F126	F.126 Wt	F127	F.127 Wt	F128	F.128 Wt	F129	F.129 Wt
Rough Biface	0	0.0	0	0.0	1	44.6	0	0.0	0	0.0
Thick Biface	0	0.0	1	25.5	1	37.9	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	1	0.5	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	2	97.7	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	1	1.3	0	0.0	1	0.3	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	1	0.7	1	1.3	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	1	89.8	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0**	**3**	**27.5**	**7**	**271.8**	**1**	**0.3**	**0**	**0.0**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	1	328.8	0	0.0	3	65.1	0	0.0	1	16.5
Bipolar Core	3	266.5	4	195.9	1	338.1	3	328.0	1	179.7
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL CORES	**4**	**595.3**	**4**	**195.9**	**4**	**403.2**	**3**	**328.0**	**2**	**196.2**
DEBITAGE										
Primary Flake	14	95.4	10	50.3	46	166.0	11	42.7	2	7.9
Second. Flake	29	93.0	28	90.9	166	438.7	30	178.0	6	14.3
Tertiary Flake	63	155.9	34	72.2	229	309.9	34	57.7	8	4.5
Biface Thin. Flk.	3	2.2	7	8.1	7	5.7	6	7.4	1	0.7
Bipolar Flake	14	173.1	13	38.5	28	88.6	7	27.8	3	8.2
Broken Flake	99	125.2	35	30.5	222	155.5	37	84.4	9	8.9
Blade	3	4.1	1	10.9	14	133.8	2	2.8	0	0.0
Shatter	140	563.1	134	556.8	283	981.3	95	801.0	36	208.9
Hoe flake	0	0.0	5	2.4	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**365**	**1212**	**267**	**860.6**	**995**	**2279.5**	**222**	**1201.8**	**65**	**253.4**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	1	101.6	0	0.0
Pitted Cobble	1	998.5	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	1	348.3	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	1	0.2	0	0.0	1	0.8	0	0.0	0	0.0
Limestone	39	2237.3	17	708.0	44	9409.5	66	7485.4	65	1168.8
FCR	8	39.4	0	0.0	5	78.2	3	14.6	0	0.0
Pebbles	11	16.6	2	8.7	9	10.7	1	1.1	0	0.0
Sandstone	2	20.4	1	1.4	4	30.3	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	1	122.2	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Gauge fragment	0	0.0	0	0.0	1	37.9	0	0.0	0	0.0
Total Non-Ch.	**63**	**3660.7**	**20**	**718.1**	**65**	**9689.6**	**71**	**7602.7**	**65**	**1168.8**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F130	F.130 Wt	F131	F.131 Wt	F132	F.132 Wt	F133	F.133 Wt	F134	F.134 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	1	0.5	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	0	0	0	0.0	0	0.0	1	0.5	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	1	41.9	0	0.0	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
TOTAL CORES	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
DEBITAGE										
Primary Flake	0	0.0	3	2.8	5	5.2	0	0.0	2	1.8
Second. Flake	0	0.0	2	6.6	3	5.3	6	12.8	1	1.2
Tertiary Flake	2	16.6	4	9.1	12	18.1	8	3.6	11	9.1
Biface Thin. Flk.	1	11.4	1	0.1	0	0.0	0	0.0	10	3.0
Bipolar Flake	2	0.8	3	11.0	3	14.6	2	7.0	0	0.0
Broken Flake	3	1.2	15	12.4	8	10.1	0	0.0	44	21.1
Blade	0	0.0	0	0.0	2	2.1	1	8.6	1	8.9
Shatter	9	42.2	30	129.7	17	294.6	17	66.7	49	56.8
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	17	72.2	58	171.7	50	350.0	34	98.7	118	101.9
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	1	54.8	0	0.0
Abrader	0	0.0	2	1071.1	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	4	4.5
Limestone	1	28.1	25	165.3	10	1573.5	62	727.8	6	4.6
FCR	0	0.0	0	0.0	1	3.8	0	0.0	0	0.0
Pebbles	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Sandstone	1	3.6	13	685.6	1	890.5	0	0.0	1	0.4
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Gauge fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	2	31.7	40	1922.0	12	2467.8	63	782.6	11	9.5

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F135	F.135 Wt	F137	F.137 Wt	F138	F.138 Wt	F139	F.139 Wt	F140	F.140 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	1	1.3
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	1	4.4	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	1	0.1	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	1	6.0	1	9.3
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**1**	**0.1**	**0**	**0.0**	**0**	**0.0**	**2**	**10.4**	**2**	**10.6**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	1	86.3	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	1	18.1	0	0.0	0	0.0	0	0.0
Unidirectional	1	28.6	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**1**	**28.6**	**2**	**104.4**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**
DEBITAGE										
Primary Flake	13	13.3	8	7.0	9	66.3	4	10.7	0	0.0
Second. Flake	25	77.1	14	21.0	12	69.9	18	63.4	15	37.8
Tertiary Flake	96	140.2	55	86.2	35	57.5	39	16.6	135	82.8
Biface Thin. Flk.	23	12.9	10	17.2	4	7.0	3	1.1	46	32.3
Bipolar Flake	3	89.4	17	84.2	6	4.0	2	7.1	6	44.6
Broken Flake	179	100.4	102	75.4	59	32.9	48	19.8	234	83.7
Blade	7	4.1	1	0.5	0	0.0	0	0.0	4	0.8
Shatter	238	451.7	264	581.7	75	97.8	51	155.1	81	169.5
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	1	236.1	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**584**	**889.1**	**472**	**1109.3**	**200**	**335.4**	**165**	**273.8**	**521**	**451.5**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	1	591.2
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	2	6.9	1	3.9	1	5.2	3	15.4
Limestone	71	3867.6	43	3819.9	25	2618.3	12	106.7	24	2496.3
FCR	11	20.4	5	5.3	0	0.0	2	1.0	4	88.8
Pebbles	10	16.8	5	4.2	3	1.8	0	0.0	1	1.2
Sandstone	1	4.7	1	8.3	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	4	1758.7
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	1	0.9	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	1	17.4	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Gauge fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**93**	**3909.5**	**57**	**3862.0**	**30**	**2624.9**	**15**	**112.9**	**37**	**4951.6**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F141	F.141 Wt	F142	F.142 Wt	F143	F.143 Wt	F144	F.144 Wt	F145	F.145 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	1	252.1	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	1	0.3	2	12.9	0	0.0	0	0.0	0	0.0
End Scraper	0	3.6	1	2.1	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	2	7.9	2	15.7	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	1	4.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	1	152.1	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	6	420	5	30.7	0	0.0	0	0.0	0	0.0
CHERT CORES										
P/C Core	1	32.1	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	4	294.0	5	446.8	0	0.0	0	0.0	0	0.0
Bipolar Core	7	312.5	4	403.8	0	0.0	0	0.0	0	0.0
Unidirectional	1	289.3	0	0.0	0	0.0	1	145.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	13	927.9	9	850.6	0	0.0	1	145.0	0	0.0
DEBITAGE										
Primary Flake	42	315.2	39	160.3	0	0.0	8	41.5	1	0.1
Second. Flake	124	908.1	39	180.2	0	0.0	36	96.5	0	0.0
Tertiary Flake	289	752.9	122	168.6	2	0.7	40	23.7	5	4.7
Biface Thin. Flk.	4	3.1	15	7.7	0	0.0	13	7.7	1	0.1
Bipolar Flake	40	328.0	37	73.7	0	0.0	12	26.2	2	1.9
Broken Flake	322	418.0	25	269.3	1	0.3	69	212.7	7	3.1
Blade	17	31.2	8	14.3	0	0.0	5	1.6	0	0.0
Shatter	404	1767.3	195	1114.6	1	0.5	81	178.1	13	21.1
Hoe flake	2	1.1	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	1	200.2	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	1245	4725.1	480	1988.7	4	1.5	264	588.0	29	31.0
NON-CHERT										
Hammerstone	3	5.3	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	1	380.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	3	5.3	0	0.0	0	0.0	1	1.3	0	0.0
Limestone	58	3927.8	30	2143.3	0	0.0	21	1255.8	0	0.0
FCR	9	94.2	0	0.0	0	0.0	0	0.0	0	0.0
Pebbles	3	23.2	1	2.8	0	0.0	4	3.7	0	0.0
Sandstone	6	17.3	1	0.2	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	1	170.5	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	1	278.1	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Gauge fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Geode	0	0.0	0	0.0	0	0.0	1	16.4	0	0.0
Total Non-Ch.	83	4351.2	34	2696.8	0	0.0	27	1277.2	0	0.0

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F146	F.146 Wt	F147	F.147 Wt	F148	F.148 Wt	F149	F.149 Wt	F150	F.150 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	1	5.6	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	0	0	0	0.0	0	0.0	1	5.6	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	1	362.2	0	0.0
Bipolar Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	0	0	0	0.0	0	0.0	1	362.2	0	0.0
DEBITAGE										
Primary Flake	0	0.0	8	52.5	0	0.0	6	86.6	3	25.4
Second. Flake	0	0.0	13	60.5	0	0.0	12	82.4	5	83.9
Tertiary Flake	0	0.0	22	29.4	0	0.0	23	40.9	6	17.0
Biface Thin. Flk.	0	0.0	1	0.3	0	0.0	7	30.8	2	4.1
Bipolar Flake	0	0.0	5	30.4	0	0.0	5	40.0	2	63.4
Broken Flake	0	0.0	29	23.2	0	0.0	55	42.6	7	6.8
Blade	0	0.0	1	4.6	0	0.0	0	0.0	0	0.0
Shatter	1	2.4	19	45.5	2	5.6	39	108.0	22	494.2
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	1	2.4	98	246.4	2	5.6	147	431.3	47	694.8
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Limestone	2	7.0	2	24.8	1	375.9	0	0.0	117	1932.2
FCR	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pebbles	0	0.0	1	0.9	0	0.0	0	0.0	0	0.0
Sandstone	0	0.0	1	2.7	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	2	30.6	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Gauge fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Geode	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	2	7	4	28.4	1	375.9	2	30.6	117	1932.2

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.151	F.151 Wt	F.152	F.152 Wt	F.153	F.153 Wt	F.154	F.154 Wt	F.155	F.155 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	1	34.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	1	19.5	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	1	7.3	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	1	13.5	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	0	0.0	0	0.0	0	0.0	4	74.3	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	1	35.6	2	778.6
Bipolar Core	0	0.0	0	0.0	0	0.0	16	2332.1	2	76.1
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	0	0.0	0	0.0	0	0.0	17	2367.7	4	854.7
DEBITAGE										
Primary Flake	12	34.8	7	45.7	0	0.0	29	231.2	7	152.4
Second. Flake	21	91.8	7	80.2	1	1.7	50	270.7	11	136.1
Tertiary Flake	92	66.0	27	63.6	0	0.0	126	453.6	31	98.7
Biface Thin. Flk	26	36.8	7	2.6	0	0.0	6	8.4	0	0.0
Bipolar Flake	7	17.7	0	0.0	0	0.0	39	220.6	8	92.0
Broken Flake	153	81.8	48	28.6	3	1.2	178	382.7	32	93.8
Blade	8	7.3	2	1.7	0	0.0	13	117.3	1	1.5
Shatter	207	560.8	82	208.1	7	4.4	253	1955.5	35	1184.0
Hoe flake	0	0.0	0	0.0	0	0.0	8	14.3	1	2.1
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	526	897.0	180	430.5	11	7.3	702	3654.3	126	1760.6
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	2	323.6	3	991.3
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	1	75.3	0	0.0
Celt	0	0.0	0	0.0	0	0.0	1	273.6	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	1	42.4	0	0.0
Hematite	2	1.5	4	3.8	0	0.0	1	0.7	0	0.0
Limestone	21	238.2	0	0.0	0	0.0	620	46929.1	17	1321.3
FCR	6	10.4	0	0.0	0	0.0	42	1395.7	1	41.3
Pebbles	4	3.1	0	0.0	0	0.0	7	20.1	0	0.0
Sandstone	1	19.1	0	0.0	0	0.0	5	132.2	1	5.3
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	1	233.0	0	0.0	0	0.0	1	548.4	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	1	34.8
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	1	96.6	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	3	1111.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Gauge fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Geode	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	2	493.9	0	0.0
Total Non-Ch.	36	601.9	4	3.8	0	0.0	686	51346.0	23	2394.0

CHERT TOOLS	F.156	F.156 Wt	F.159	F.159 Wt	F.160	F.160 Wt	F.161	F.161 Wt	F.162	F.162 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	1	10.1	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	4	213.9	0	0.0	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	1	58.8	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**0**	**0.0**	**4**	**213.9**	**1**	**58.8**	**1**	**10.1**	**0**	**0.0**
DEBITAGE										
Primary Flake	0	0.0	7	88.9	8	22.6	0	0.0	1	5.5
Second. Flake	0	0.0	38	143.6	8	46.8	2	6.6	2	2.5
Tertiary Flake	2	2.3	93	120.2	48	35.3	8	3.3	3	3.2
Biface Thin. Flk.	0	0.0	1	3.7	2	0.3	3	2.1	0	0.0
Bipolar Flake	0	0.0	14	82.5	1	0.7	0	0.0	1	5.0
Broken Flake	0	0.0	124	162.2	54	36.1	12	9.7	5	1.5
Blade	0	0.0	4	22.0	0	0.0	0	0.0	0	0.0
Shatter	5	67.3	177	1058.9	64	72.8	17	50.4	5	10.4
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**7**	**69.6**	**458**	**1682.0**	**185**	**214.6**	**42**	**72.1**	**17**	**28.1**
NON-CHERT										
Hammerstone	0	0.0	2	249.9	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	1	32.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	1	13.8	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	3	12.1	1	0.2	2	7.3	1	3.1
Limestone	2	1.9	43	12246.7	76	977.0	8	14.2	1	1.2
FCR	0	0.0	12	76.6	1	1.4	0	0.0	0	0.0
Pebbles	0	0.0	3	2.2	2	2.8	0	0.0	0	0.0
Sandstone	0	0.0	7	78.7	0	0.0	1	13.8	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	1	70.7	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Geode	0	0.0	1	13.7	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Concretion	0	0.0	1	1.5	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**2**	**1.9**	**72**	**12681.4**	**83**	**1097.9**	**11**	**35.3**	**2**	**4.3**

CHERT TOOLS	F.163	F.163 Wt	F.164	F.164 Wt	F.165	F.165 Wt	F.166	F.166 Wt	F.167	F.167 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	1	21.8	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	1	86.8	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	1	1.2	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0.0**	**1**	**86.8**	**1**	**1.2**	**1**	**21.8**	**0**	**0.0**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	1	67.4	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	1	11.7	1	92.6	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**0**	**0.0**	**0**	**0.0**	**2**	**79.1**	**1**	**92.6**	**0**	**0.0**
DEBITAGE										
Primary Flake	4	2.1	7	54.2	23	84.4	2	9.7	1	0.4
Second. Flake	0	0.0	7	33.2	65	382.1	1	4.8	2	1.9
Tertiary Flake	8	8.1	18	37.3	120	233.8	7	9.3	6	7.4
Biface Thin. Flk.	0	0.0	2	0.5	15	10.9	0	0.0	1	0.2
Bipolar Flake	2	0.8	0	0.0	16	124.6	0	0.0	0	0.0
Broken Flake	13	2.5	15	21.0	172	283.4	18	10.7	8	5.7
Blade	0	0.0	0	0.0	2	15.4	1	0.2	0	0.0
Shatter	22	32.3	28	68.7	263	1685.5	26	122.0	14	9.5
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**49**	**45.8**	**77**	**214.9**	**676**	**2820.1**	**55**	**156.7**	**32**	**25.1**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	1	155.5	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	1	37.2	0	0.0
Hematite	1	0.7	0	0.0	2	6.5	0	0.0	0	0.0
Limestone	6	104.6	136	3174.3	142	4905.5	13	133.8	0	0.0
FCR	0	0.0	0	0.0	3	63.0	0	0.0	0	0.0
Pebbles	0	0.0	1	0.2	5	8.3	0	0.0	0	0.0
Sandstone	0	0.0	0	0.0	0	0.0	1	2.3	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	2	307.3	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Geode	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Concretion	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	7	105.3	137	3174.5	155	5446.1	15	173.3	0	0.0

CHERT TOOLS	F.168	F.168 Wt	F.169	F.169 Wt	F.170	F.170 Wt	F.171	F.171 Wt	F.172	F.172 Wt
Rough Biface	0	0.0	0	0.0	1	252.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	1	5.8	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	2	38.2	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0.0**	**0**	**0.0**	4	**296.0**	**0**	**0.0**	**0**	**0.0**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	1	13.8	0	0.0
Bipolar Core	0	0.0	0	0.0	1	52.3	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**0**	**0.0**	**0**	**0.0**	**1**	**52.3**	**1**	**13.8**	**0**	**0.0**
DEBITAGE										
Primary Flake	2	0.4	0	0.0	8	84.0	2	1.7	1	1.9
Second. Flake	2	1.9	3	2.3	13	248.8	2	1.0	10	72.6
Tertiary Flake	6	7.4	2	0.5	35	121.7	11	31.4	9	15.4
Biface Thin. Flk.	1	0.2	0	0.0	6	2.4	0	0.0	2	0.3
Bipolar Flake	0	0.0	0	0.0	11	76.5	3	5.4	6	16.1
Broken Flake	8	5.7	9	4.7	114	112.2	1	1.6	34	42.1
Blade	0	0.0	0	0.0	2	2.2	0	0.0	0	0.0
Shatter	14	9.5	5	8.4	131	726.7	8	21.4	25	228.4
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	1	2.2
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**33**	**25.1**	**19**	**15.9**	**320**	**1374.5**	**27**	**62.5**	**88**	**379.0**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	1	81.9	0	0.0	1	151.2
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	1	33.2	0	0.0	1	2.5
Limestone	0	0.0	15	216.4	118	2461.8	15	96.3	14	73.4
FCR	0	0.0	0	0.0	2	54.4	0	0.0	0	0.0
Pebbles	0	0.0	0	0.0	4	12.4	0	0.0	2	0.7
Sandstone	0	0.0	2	404.9	4	5.0	0	0.0	2	8.1
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	2	316.7	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Geode	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Concretion	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**0**	**0.0**	**17**	**621.3**	**132**	**2965.4**	**15**	**96.3**	**20**	**235.9**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.173	F.173 Wt	F.174	F.174 Wt	F.175	F.175 Wt	F.176	F.176 Wt	F.177	F.177 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	1	0.4	0	0.0	1	0.7	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	1	3.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	0	0.0	1	0.4	0	0.0	2	3.7	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	1	89.0	0	0.0	0	0.0	1	23.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	0	0.0	1	89.0	0	0.0	0	0.0	1	23.0
DEBITAGE										
Primary Flake	0	0.0	6	30.2	3	23.0	2	0.8	2	11.8
Second. Flake	0	0.0	6	21.8	5	3.6	9	9.7	2	2.2
Tertiary Flake	0	0.0	21	22.1	21	10.7	13	7.0	17	31.1
Biface Thin. Flk.	0	0.0	5	19.6	6	3.7	1	0.1	0	0.0
Bipolar Flake	0	0.0	5	17.9	1	0.2	0	0.0	2	2.7
Broken Flake	0	0.0	71	45.6	27	14.2	18	17.1	2	1.8
Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Shatter	1	0.4	43	79.2	31	44.0	11	104.5	13	136.4
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	1	0.4	157	236.4	94	99.4	54	139.2	38	186.0
NON-CHERT										
Hammerstone	0	0.0	1	838.9	1	541.2	0	0.0	4	2205.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	1	21.7	0	0.0	0	0.0	0	0.0
Limestone	30	67.1	8	11.2	10	43.4	1	0.7	37	10492.8
FCR	0	0.0	0	0.0	2	63.8	9	216.5	0	0.0
Pebbles	0	0.0	4	1.2	0	0.0	1	1.2	0	0.0
Sandstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Geode	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Limonite	0	0.0	2	31.8	0	0.0	0	0.0	0	0.0
Total Non-Ch.	30	67.1	14	873.0	13	648.4	11	218.4	41	12697.8

CHERT TOOLS	F.178	F.178 Wt	F.179	F.179 Wt	F.180	F.180 Wt	F.181	F.181 Wt	F.182	F.182 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	1	36.4	1	1.3	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	1	201.8
Proj. Point	1	0.6	0	0.0	0	0.0	0	0.0	1	1.3
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	2	**37.0**	1	**1.3**	0	**0.0**	**0**	**0.0**	2	**203.1**
CHERT CORES										
P/C Core	1	33.5	0	0.0	1	20.0	0	0.0	0	0.0
M/D Core	0	0.0	2	55.7	2	86.2	0	0.0	0	0.0
Bipolar Core	1	19.4	0	0.0	1	76.0	0	0.0	0	0.0
Unidirectional	1	98.1	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	3	**151.0**	2	55.7	4	182.2	**0**	**0.0**	**0**	**0.0**
DEBITAGE										
Primary Flake	6	29.4	12	59.1	1	4.1	1	0.2	16	25.0
Second. Flake	31	133.7	45	225.1	10	22.6	1	7.2	29	147.5
Tertiary Flake	45	75.2	112	144.5	0	0.0	0	0.0	62	90.9
Biface Thin. Flk.	5	2.6	13	21.5	0	0.0	1	0.2	7	10.5
Bipolar Flake	8	117.7	18	22.7	4	19.2	0	0.0	9	66.7
Broken Flake	68	82.9	147	368.6	14	25.4	2	0.4	103	70.2
Blade	1	0.3	3	1.2	1	0.4	0	0.0	0	0.0
Shatter	81	292.3	191	812.5	21	157.1	2	0.4	119	1465.5
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**245**	**734.1**	**541**	**1655.2**	**51**	**228.8**	**7**	**8.4**	**345**	**1876.3**
NON-CHERT										
Hammerstone	0	0.0	1	114.9	0	0.0	0	0.0	2	289.7
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	1	192.7	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	1	108.6	1	85.2	0	0.0	0	0.0	0	0.0
Hematite	1	7.6	1	9.5	0	0.0	0	0.0	5	6.1
Limestone	87	4229.4	37	2567.5	7	470.2	1	0.8	44	562.2
FCR	1	36.0	8	123.2	0	0.0	0	0.0	0	0.0
Pebbles	4	27.0	7	4.9	2	72.3	0	0.0	7	7.2
Sandstone	3	3.9	4	24.3	0	0.0	0	0.0	2	2.9
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	1	1043.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	1	5.5	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Geode	0	0.0	1	3.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mudstone	0	0.0	2	9.8	0	0.0	0	0.0	0	0.0
Total Non-Ch.	100	**5653.7**	62	**2942.3**	9	**542.5**	1	**0.8**	60	**868.1**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.183	F.183 Wt	F.186	F.186 Wt	F.188	F.188 Wt	F.189	F.189 Wt	F.190	F.190 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	1	0.6	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	0	0.0	1	0.6	0	0.0	0	0.0	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
DEBITAGE										
Primary Flake	0	0.0	1	0.3	0	0.0	0	0.0	0	0.0
Second. Flake	0	0.0	1	0.4	0	0.0	0	0.0	2	7.0
Tertiary Flake	2	0.5	3	6.7	14	6.3	2	0.2	1	13.1
Biface Thin. Flk	0	0.0	0	0.0	2	0.8	0	0.0	0	0.0
Bipolar Flake	1	0.2	0	0.0	0	0.0	0	0.0	0	0.0
Broken Flake	8	8.9	4	1.1	24	10.9	1	0.4	5	2.5
Blade	0	0.0	0	0.0	1	0.5	0	0.0	0	0.0
Shatter	10	73.4	12	4.1	26	22.5	2	2.3	4	4.3
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	21	83.0	21	12.6	67	41.0	5	2.9	12	26.9
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Limestone	1	0.1	0	0.0	33	14625.2	0	0.0	0	0.0
FCR	2	16.4	0	0.0	0	0.0	0	0.0	0	0.0
Pebbles	1	0.9	0	0.0	0	0.0	0	0.0	0	0.0
Sandstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Geode	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mudstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	4	17.4	0	0.0	33	14625.2	0	0.0	0	0.0

CHERT TOOLS	F.191	F.191 Wt	F.192	F.192 Wt	F.193	F.193 Wt	F.195	F.195 Wt	F.196	F.196 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
DEBITAGE										
Primary Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Second. Flake	4	6.2	0	0.0	0	0.0	4	0.9	1	1.8
Tertiary Flake	4	4.7	1	1.1	1	3.6	0	0.0	5	9.2
Biface Thin. Flk.	1	0.2	0	0.0	0	0.0	0	0.0	2	4.4
Bipolar Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Broken Flake	16	7.3	3	2.1	5	6.9	0	0.0	14	8.1
Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Shatter	11	8.1	3	5.0	7	5.2	12	13.3	20	27.9
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	36	26.5	7	8.2	13	15.7	16	14.2	42	51.4
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Limestone	0	0.0	0	0.0	0	0.0	26	165.1	1	1.8
FCR	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pebbles	1	0.4	0	0.0	0	0.0	0	0.0	1	0.2
Sandstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Igneous	1	85.4	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Concretion	0	0.0	2	0.5	0	0.0	1	0.3	0	0.0
Mudstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	2	85.8	2	0.5	0	0.0	28	165.5	2	2.0

CHERT TOOLS	F.197	F.197 Wt	F.198	F.198 Wt	F.199	F.199 Wt	F.200	F.200 Wt	F.201	F.201 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**
DEBITAGE										
Primary Flake	0	0.0	0	0.0	0	0.0	3	4.1	0	0.0
Second. Flake	0	0.0	2	4.4	0	0.0	0	0.0	0	0.0
Tertiary Flake	2	1.0	8	13.1	2	4.4	4	1.1	0	0.0
Biface Thin. Flk.	0	0.0	1	0.1	0	0.0	0	0.0	0	0.0
Bipolar Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Broken Flake	2	1.3	23	26.1	22	8.5	19	11.4	2	0.8
Blade	0	0.0	1	1.6	0	0.0	0	0.0	0	0.0
Shatter	8	19.5	25	13.1	29	88.4	34	31.3	2	1.3
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**12**	**21.8**	**60**	**58.4**	**53**	**101.3**	**60**	**47.9**	**4**	**2.1**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Limestone	0	0.0	22	1001.7	0	0.0	1	0.1	0	0.0
FCR	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pebbles	0	0.0	0	0.0	5	1.6	0	0.0	1	3.4
Sandstone	0	0.0	0	0.0	1	3.3	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	1	9000.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Concretion	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mudstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**0**	**0.0**	**23**	**10001.7**	**6**	**4.9**	**1**	**0.1**	**1**	**3.4**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.202	F.202 Wt	F.203	F.203 Wt	F.204	F.204 Wt	F.205	F.205 Wt	F.206	F.206 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	0	0.0	0	0.0	2	12.9
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**2**	**12.9**
DEBITAGE										
Primary Flake	0	0.0	2	1.1	1	15.2	0	0.0	24	148.1
Second. Flake	1	0.4	2	6.2	1	3.5	0	0.0	28	58.2
Tertiary Flake	2	1.5	5	4.1	7	5.5	0	0.0	26	18.6
Biface Thin. Flk.	1	0.3	1	2.5	0	0.0	2	0.8	8	9.0
Bipolar Flake	0	0.0	0	0.0	0	0.0	0	0.0	27	80.3
Broken Flake	8	4.1	9	3.9	20	7.8	2	0.4	87	100.5
Blade	0	0.0	0	0.0	0	0.0	1	5.0	2	1.4
Shatter	6	13.2	4	2.4	32	58.3	6	3.8	100	374.4
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**18**	**19.5**	**23**	**20.2**	**61**	**90.3**	**11**	**10.0**	**303**	**790.7**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	2	2.3	0	0.0	0	0.0
Limestone	0	0.0	0	0.0	2	4.6	0	0.0	111	2483.3
FCR	0	0.0	0	0.0	3	2.8	0	0.0	1	91.1
Pebbles	0	0.0	0	0.0	2	0.6	0	0.0	3	3.9
Sandstone	0	0.0	0	0.0	0	0.0	0	0.0	1	5.2
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Geode	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mudstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**0**	0.0	0	**0.0**	**9**	**10.3**	**0**	0.0	**116**	**2583.5**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.207	F.207 Wt	F.208	F.208 Wt	F.209	F.209 Wt	F.210	F.210 Wt	F.211	F.211 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	1	13.7	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	2	4.9	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**3**	**18.6**	**0**	**0.0**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	0	0.0	3	261.1	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**3**	**261.1**	**0**	**0.0**
DEBITAGE										
Primary Flake	0	0.0	0	0.0	1	7.0	17	50.4	0	0.0
Second. Flake	0	0.0	0	0.0	2	1.9	24	120.5	0	0.0
Tertiary Flake	1	3.6	7	4.3	7	7.8	59	79.8	1	5.0
Biface Thin. Flk	0	0.0	0	0.0	0	0.0	13	12.5	0	0.0
Bipolar Flake	0	0.0	1	1.9	0	0.0	5	16.6	0	0.0
Broken Flake	4	1.3	19	5.9	8	3.4	132	117.7	1	0.5
Blade	0	0.0	0	0.0	0	0.0	2	4.1	0	0.0
Shatter	3	41.5	11	22.4	7	24.2	137	742.6	0	0.0
Hoe flake	0	0.0	0	0.0	0	0.0	1	2.2	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**8**	**46.4**	**38**	**34.5**	**25**	**44.3**	**390**	**1146.4**	**2**	**5.5**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	1	72.4	0	0.0
Hematite	0	0.0	2	0.8	0	0.0	1	1.1	0	0.0
Limestone	23	3248.9	4	22.8	39	136.9	42	2187.7	0	0.0
FCR	0	0.0	1	50.7	1	7.3	5	30.4	0	0.0
Pebbles	1	0.6	1	0.1	1	0.3	9	21.5	0	0.0
Sandstone	1	3175.1	0	0.0	0	0.0	5	123.4	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	1	916.5	1	110.3	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	1	0.3	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Geode	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mudstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**25**	**6424.6**	**8**	**74.4**	**42**	**1061.0**	**65**	**2547.1**	**0**	**0.0**

CHERT TOOLS	F.212	F.212 Wt	F.213	F.213 Wt	F.214	F.214 Wt	F.215	F.215 Wt	F.216	F.216 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	1	1.9	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**1**	**1.9**	**0**	**0.0**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**
DEBITAGE										
Primary Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Second. Flake	0	0.0	1	0.4	0	0.0	0	0.0	3	3.3
Tertiary Flake	0	0.0	2	6.8	4	4.8	7	2.5	7	20.2
Biface Thin. Flk.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Flake	0	0.0	0	0.0	0	0.0	0	0.0	3	3.4
Broken Flake	0	0.0	1	0.4	13	7.3	22	10.1	21	17.1
Blade	0	0.0	0	0.0	0	0.0	0	0.0	1	12.9
Shatter	1	0.4	4	4.0	32	39.3	31	18.4	49	37.2
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**1**	**0.4**	**8**	**11.6**	**49**	**51.4**	**60**	**31.0**	**84**	**94.1**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	1	1.9	0	0.0	1	0.4
Limestone	0	0.0	0	0.0	0	0.0	0	0.0	11	33.7
FCR	0	0.0	0	0.0	0	0.0	0	0.0	1	0.3
Pebbles	0	0.0	0	0.0	1	0.4	1	0.7	2	0.3
Sandstone	0	0.0	0	0.0	0	0.0	1	3.4	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Geode	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mudstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**0**	**0.0**	**0**	**0.0**	**2**	**2.3**	**2**	**4.1**	**15**	**34.7**

CHERT TOOLS	F.217	F.217 Wt	F.218	F.218 Wt	F.219	F.219	F.220	F.220 Wt	F.221	F.221 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	1	1.7
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	1	12.1
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0.0**	**0**	**0.0**	0	**0.0**	0	**0.0**	**2**	**13.8**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	4	233.5
Bipolar Core	0	0.0	0	0.0	0	0.0	0	0.0	12	812.9
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	1	72.9
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**17**	**1119.3**
DEBITAGE										
Primary Flake	0	0.0	1	0.6	0	0.0	0	0.0	56	1213.7
Second. Flake	1	8.4	0	0.0	0	0.0	0	0.0	172	1584.9
Tertiary Flake	7	7.9	0	0.0	2	0.2	1	0.5	278	562.8
Biface Thin. Flk.	0	0.0	2	21.9	0	0.0	0	0.0	1	0.2
Bipolar Flake	0	0.0	0	0.0	0	0.0	0	0.0	37	291.8
Broken Flake	26	10.6	3	1.3	6	7.7	14	2.7	248	502.2
Blade	0	0.0	0	0.0	0	0.0	0	0.0	8	24.7
Shatter	46	108.5	0	0.0	3	1.2	31	31.2	410	4912.0
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**80**	**135.4**	**6**	**23.8**	**11**	**9.1**	**46**	**34.4**	**1210**	**9092.3**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	1	132.6
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	2	30.3
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	1	1.3
Limestone	0	0.0	0	0.0	0	0.0	2	10.2	188	9414.3
FCR	0	0.0	0	0.0	0	0.0	0	0.0	4	266.2
Pebbles	0	0.0	0	0.0	0	0.0	3	0.7	6	175.4
Sandstone	0	0.0	0	0.0	0	0.0	0	0.0	3	138.5
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	1	758.3
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	4	721.6
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Gauge fragment	0	0.0	0	0.0	0	0.0	0	0.0	1	85.9
Concretion	0	0.0	0	0.0	0	0.0	0	0.0	1	2.4
Mudstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Disc	0	0.0	0	0.0	0	0.0	0	0.0	1	22.4
Total Non-Ch.	0	**0.0**	0	**0.0**	**0**	**0.0**	**5**	**10.9**	**213**	**11749.2**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.222	F.222 Wt	F.223	F.223 Wt	F.224	F.224 Wt	F.225	F.225 Wt	F.226	F.226 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	1	0.8	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	1	17.9	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	1	20.8	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	1	5.2	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	1	172.7	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	1	7.9	0	0.0	1	20.3
Total Tools	**2**	**21.6**	**3**	**195.8**	**1**	**7.9**	**0**	**0.0**	**1**	**20.3**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	1	381.4	0	0.0	0	0.0	0	0.0
Bipolar Core	1	22.9	2	179.0	2	490.5	0	0.0	1	78.6
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**1**	**22.9**	**3**	**560.4**	**2**	**490.5**	**0**	**0.0**	**1**	**78.6**
DEBITAGE										
Primary Flake	27	138.4	10	130.5	4	30.2	1	2.3	0	0.0
Second. Flake	69	284.3	19	219.3	5	40.5	4	12.6	5	32.2
Tertiary Flake	81	94.9	94	133.1	48	85.3	8	22.3	27	112.1
Biface Thin. Flk.	5	3.1	4	5.1	2	0.8	0	0.0	0	0.0
Bipolar Flake	41	125.0	12	31.8	6	109.1	5	16.4	5	62.0
Broken Flake	245	264.5	131	170.4	36	81.7	12	8.9	30	42.7
Blade	0	0.0	4	14.2	0	0.0	0	0.0	1	1.5
Shatter	338	1309.3	86	331.8	91	480.3	14	53.6	51	116.1
Hoe flake	1	7.6	0	0.0	1	0.1	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**807**	**2227.1**	**360**	**1036.2**	**193**	**828.0**	**44**	**116.1**	**119**	**366.6**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	1	204.9	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Limestone	44	1038.6	186	12440.1	27	13597.4	14	520.6	44	1008.2
FCR	2	31.9	7	547.5	0	0.0	3	97.8	0	0.0
Pebbles	1	0.4	4	2.8	5	4.3	1	0.5	0	0.0
Sandstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	1	191.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mudstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Disc	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**47**	**1070.9**	**197**	**12990.4**	**34**	**13997.6**	**18**	**618.9**	**44**	**1008.2**

CHERT TOOLS	F.227	F.227 Wt	F.228	F.228 Wt	F.229	F.229 Wt	F.230	F.230 Wt	F.231	F.231 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	1	28.6	0	0.0	0	0.0
Thin Biface	0	0.0	2	4.7	3	4.9	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	1	6.9	3	24.5	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	0	**0.0**	3	11.6	7	**58.0**	**0**	**0.0**	**0**	**0.0**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	2	192.8	0	0.0	0	0.0
Bipolar Core	1	80.6	5	131.8	15	989.4	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**1**	**80.6**	**5**	**131.8**	**17**	**1182.2**	**0**	**0.0**	**0**	**0.0**
DEBITAGE										
Primary Flake	1	3.9	7	101.8	46	221.4	8	19.3	0	0.0
Second. Flake	0	0.0	26	123.5	132	476.7	20	126.7	0	0.0
Tertiary Flake	2	6.5	29	86.3	253	369.0	44	36.5	2	0.3
Biface Thin. Flk.	0	0.0	0	0.0	18	16.2	9	4.9	0	0.0
Bipolar Flake	0	0.0	18	89.6	112	419.1	0	0.0	0	0.0
Broken Flake	0	0.0	45	131.3	395	465.4	124	79.6	11	3.5
Blade	0	0.0	1	4.1	13	27.7	0	0.0	0	0.0
Shatter	4	3.9	95	895.5	534	2625.3	59	85.4	14	45.4
Hoe flake	0	0.0	0	0.0	5	6.8	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**7**	**14.3**	**221**	**1432.1**	**1508**	**4627.6**	**264**	**352.4**	**27**	**49.2**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	1	89.6	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	1	372.3	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	1	5.1	0	0.0
Celt	0	0.0	0	0.0	2	202.5	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	2	167.8	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	7	35.5	1	0.4	0	0.0
Limestone	16	169.6	14	376.4	501	15389.6	25	341.3	0	0.0
FCR	0	0.0	0	0.0	39	208.9	2	6.4	0	0.0
Pebbles	3	57.3	2	28.1	9	78.7	12	8.4	4	1.5
Sandstone	0	0.0	0	0.0	11	303.5	2	6.8	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	1	89.5	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	1	28.2	0	0.0	0	0.0
Tested cobble	0	0.0	1	138.8	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone pipe frgm	0	0.0	0	0.0	1	5.7	0	0.0	0	0.0
Quartz	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0
Total Non-Ch.	19	226.9	17	543.3	576	16971.8	44	368.5	4	1.5

CHERT TOOLS	F.232	F.232 Wt	F.233	F.233 Wt	F.234	F.234 Wt	F.235	F.235 Wt	F.236	F.236 Wt
Rough Biface	0	0.0	1	152.4	0	0.0	0	0.0	1	71.5
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	1	7.8
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	1	1.6
End Scraper	0	0.0	1	7.7	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	1	4.8	0	0.0	1	13.4	3	8.3
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	1	52.1	2	4.9
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0.0**	**3**	164.9	**0**	**0.0**	**2**	**65.5**	**8**	**94.1**
CHERT CORES										
P/C Core	1	91.5	0	0.0	0	0.0	0	0.0	1	180.6
M/D Core	0	0.0	1	152.5	0	0.0	0	0.0	1	96.8
Bipolar Core	1	57.2	2	59.0	0	0.0	2	49.3	2	169.4
Unidirectional	1	18.6	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**3**	**167.3**	**3**	**211.5**	**0**	**0.0**	**2**	**49.3**	**4**	**446.8**
DEBITAGE										
Primary Flake	6	59.9	5	72.5	1	1.8	14	71.3	17	49.3
Second. Flake	11	104.6	20	118.0	1	0.7	21	111.2	33	339.8
Tertiary Flake	20	70.4	32	104.1	6	6.2	36	25.8	93	165.4
Biface Thin. Flk.	5	5.8	8	15.7	0	0.0	3	6.0	18	8.5
Bipolar Flake	1	20.3	5	15.7	1	0.4	5	4.1	21	64.2
Broken Flake	13	14.0	56	55.9	5	3.5	63	63.6	200	166.7
Blade	1	11.9	1	9.5	0	0.0	1	3.9	1	3.5
Shatter	37	345.9	64	551.5	6	5.3	50	131.7	232	815.4
Hoe flake	0	0.0	3	19.7	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	94	**632.8**	**194**	**962.6**	**20**	**17.9**	**193**	**417.6**	**615**	**1612.8**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	2	309.0
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	3	7.2
Limestone	13	309.0	60	6971.2	3	91.7	25	191.7	79	8508.4
FCR	0	0.0	0	0.0	3	122.6	1	3.8	46	216.2
Pebbles	0	0.0	3	7.9	0	0.0	5	3.2	15	12.4
Sandstone	0	0.0	0	0.0	0	0.0	11	111.2	1	27.5
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	2	847.2
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Disc	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone pipe frgm	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Quartz	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	13	309.0	63	6979.1	6	214.3	42	309.9	148	9927.9

CHERT TOOLS	F.237	F.237 Wt	F.238	F.238 Wt	F.239	F.239 Wt	F.240	F.240 Wt	F.241	F.241 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rct. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**
DEBITAGE										
Primary Flake	0	0.0	1	0.2	1	5.5	0	0.0	2	1.2
Second. Flake	0	0.0	3	1.0	2	2.5	0	0.0	4	4.2
Tertiary Flake	2	0.7	5	5.9	7	1.9	0	0.0	7	5.3
Biface Thin. Flk.	1	0.2	1	0.4	1	0.2	1	1.0	1	0.4
Bipolar Flake	0	0.0	0	0.0	1	38.5	1	0.3	3	11.0
Broken Flake	4	3.7	32	8.7	17	7.0	7	9.9	36	17.3
Blade	0	0.0	1	0.6	0	0.0	0	0.0	0	0.0
Shatter	2	42.8	20	20.4	21	29.1	20	23.0	50	60.5
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**9**	**47.4**	**63**	**37.2**	**50**	**84.7**	**29**	**34.2**	**103**	**99.9**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Limestone	1	0.6	0	0.0	1	5.5	0	0.0	7	4.7
FCR	0	0.0	0	0.0	0	0.0	0	0.0	2	7.6
Pebbles	0	0.0	3	0.4	1	0.5	2	1.2	1	0.1
Sandstone	0	0.0	0	0.0	0	0.0	0	0.0	1	9.8
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	1	90.2
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Disc	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone pipe frgm	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Quartz	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**1**	**0.6**	**3**	**0.4**	**2**	**6.0**	**2**	**1.2**	**12**	**112.4**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.242	F.242 Wt	F.243	F.243 Wt	F.244	F.244 Wt	F.245	F.245 Wt	F.247	F.247 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**
DEBITAGE										
Primary Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Second. Flake	4	10.3	3	6.0	3	9.1	1	3.9	0	0.0
Tertiary Flake	2	0.8	6	7.7	2	0.5	1	0.1	0	0.0
Biface Thin. Flk.	0	0.0	0	0.0	1	1.1	0	0.0	0	0.0
Bipolar Flake	1	3.1	2	1.5	1	1.4	0	0.0	0	0.0
Broken Flake	4	1.1	16	17.8	4	1.1	2	4.8	3	0.7
Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Shatter	8	25.7	45	32.3	14	29.8	3	4.8	3	2.9
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**19**	**41.0**	**72**	**65.3**	**25**	**43.0**	**7**	**13.6**	**6**	**3.6**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	2	1.6	0	0.0	0	0.0	0	0.0
Limestone	0	0.0	26	14629.5	0	0.0	2	10.9	0	0.0
FCR	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pebbles	0	0.0	1	0.8	1	2.2	0	0.0	0	0.0
Sandstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	1	0.5	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Disc	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone pipe frgm	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Quartz	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**0**	**0.0**	**30**	**14632.4**	**1**	**2.2**	**2**	**10.9**	**0**	**0.0**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.249	F.249 Wt	F.250	F.250 Wt	F.252	F.252 Wt	F.253	F.253 Wt	F.254	F.254 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
DEBITAGE										
Primary Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Second. Flake	0	0.0	0	0.0	0	0.0	1	0.3	0	0.0
Tertiary Flake	0	0.0	1	0.3	1	0.2	2	0.5	1	2.3
Biface Thin. Flk.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Broken Flake	0	0.0	1	4.9	2	0.4	4	0.9	0	0.0
Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Shatter	0	0.0	3	3.0	1	0.8	9	6.0	0	0.0
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	0	0.0	5	8.2	4	1.4	16	7.7	1	2.3
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Limestone	1	2000.0	1	417.4	0	0.0	0	0.0	2	38.3
FCR	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pebbles	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Sandstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mudstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone pipe frgm	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	1	2000.0	1	417.4	0	0.0	0	0.0	2	38.3

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.255	F.255 Wt	F.256	F.256 Wt	F.257	F.257 Wt	F.258	F.258 Wt	F.260	F.260 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	1	29.2	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	1	5.6	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	1	1.0	0	0.0	0	0.0	1	11.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	1	2.5	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	1	1.0	1	5.6	0	0.0	3	42.7	0	0.0
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bipolar Core	1	23.3	0	0.0	0	0.0	1	41.8	0	0.0
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	1	23.3	0	0.0	0	0.0	1	41.8	0	0.0
DEBITAGE										
Primary Flake	7	30.7	1	9.8	4	2.9	10	48.9	0	0.0
Second. Flake	19	51.9	6	26.8	18	18.2	20	37.0	0	0.0
Tertiary Flake	60	55.4	11	19.8	35	49.5	74	83.8	0	0.0
Biface Thin. Flk.	3	2.4	4	3.7	10	12.5	3	0.9	0	0.0
Bipolar Flake	33	94.4	6	16.6	0	0.0	18	89.6	0	0.0
Broken Flake	121	125.2	27	50.0	136	136.0	65	111.0	1	0.1
Blade	3	1.3	1	1.0	1	1.0	3	6.2	0	0.0
Shatter	163	1019.4	45	117.2	79	160.0	74	550.1	1	0.4
Hoe flake	1	0.2	0	0.0	0	0.0	2	3.3	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	410	1380.9	101	244.9	283	380.1	269	930.8	2	0.5
NON-CHERT										
Hammerstone	0	0.0	1	291.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	1	168.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	3	5.3	1	8.9	2	7.8	1	0.8	0	0.0
Limestone	135	30503.2	17	6382.8	13	7.6	15	436.2	0	0.0
FCR	8	26.1	0	0.0	2	11.7	2	6.3	0	0.0
Pebbles	4	1.4	1	0.6	3	0.7	3	13.5	0	0.0
Sandstone	2	10.2	0	0.0	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	1	384.7	1	123.2	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mudstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone pipe frgm	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	152	30546.2	21	7068.0	22	319.0	21	456.8	0	0.0

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.259	F.259 Wt	F.261	F.261	F.262	F.262 Wt	F.263	F.263 Wt	F.264	F.264 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	1	2.9
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	1	3.3	0	0.0	0	0.0	0	0.0	0	0.0
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	**1**	**3.3**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**1**	**2.9**
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	0	0.0	0	0.0	0	0.0	2	79.0
Bipolar Core	0	0.0	0	0.0	0	0.0	0	0.0	1	185.5
Unidirectional	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**3**	**264.5**
DEBITAGE										
Primary Flake	0	0.0	0	0.0	0	0.0	1	0.2	9	33.7
Second. Flake	7	25.7	0	0.0	0	0.0	0	0.0	26	177.9
Tertiary Flake	13	17.2	0	0.0	0	0.0	2	1.3	47	98.3
Biface Thin. Flk.	1	0.1	0	0.0	0	0.0	0	0.0	5	9.7
Bipolar Flake	3	14.1	0	0.0	0	0.0	0	0.0	11	54.5
Broken Flake	17	21.3	6	2.3	2	2.8	3	1.2	53	80.1
Blade	0	0.0	0	0.0	0	0.0	0	0.0	2	9.1
Shatter	21	118.7	1	0.2	0	0.0	2	16.4	69	459.4
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	**62**	**197.1**	**7**	**2.5**	**2**	**2.8**	**8**	**19.1**	**222**	**922.7**
NON-CHERT										
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hematite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Limestone	2	117.5	1	20.3	0	0.0	0	0.0	33	10334.7
FCR	0	0.0	0	0.0	0	0.0	1	1.6	0	0.0
Pebbles	1	0.9	0	0.0	0	0.0	0	0.0	2	9.8
Sandstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	2	1433.1
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mudstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone pipe frgm	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Non-Ch.	**3**	**118.4**	**1**	**20.3**	**0**	**0.0**	**1**	**1.6**	**37**	**11777.6**

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.265	F.265 Wt	F.266	F.266 Wt	F.267	F.267 Wt	F.268	F.268 Wt	F.269	F.269 Wt
Rough Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thick Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Thin Biface	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
End Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Ret. Flake	0	0.0	1	1.5	0	0.0	0	0.0	0	0.0
Ret. Blade	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hafted Scraper	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Perforator	0	0.0	0	0.0	0	0.0	0	0.0	1	1.3
Hoe	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Proj. Point	0	0.0	0	0.0	0	0.0	0	0.0	1	0.3
Hammerstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Wedge	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Tools	0	0.0	1	1.5	0	0.0	0	0.0	2	1.6
CHERT CORES										
P/C Core	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
M/D Core	0	0.0	1	53.1	0	0.0	0	0.0	0	0.0
Bipolar Core	0	0.0	2	58.9	0	0.0	0	0.0	2	92.4
Unidirectional	0	0.0	2	150.8	0	0.0	0	0.0	0	0.0
Exhausted	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Core fragment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Cores	0	0.0	5	262.8	0	0.0	0	0.0	2	92.4
DEBITAGE										
Primary Flake	0	0.0	8	18.9	4	6.4	3	3.5	7	19.8
Second. Flake	3	57.5	18	64.5	6	1.7	0	0.0	16	199.7
Tertiary Flake	4	1.0	37	102.8	6	31.3	0	0.0	27	55.0
Biface Thin. Flk.	0	0.0	8	5.6	1	7.4	0	0.0	3	8.8
Bipolar Flake	1	0.3	7	51.5	2	2.9	0	0.0	6	2.4
Broken Flake	5	1.5	125	147.2	20	15.5	2	0.5	38	60.3
Blade	0	0.0	1	1.0	1	1.2	0	0.0	2	9.4
Shatter	5	13.6	119	491.0	22	58.2	5	39.0	82	787.0
Hoe flake	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Nodules	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Piece esquillee	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Debitage	18	73.9	323	882.5	62	124.6	10	43.0	181	1142.4
NON-CHERT										
Hammerstone	0	0.0	1	90.6	0	0.0	0	0.0	0	0.0
Pitted Cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mano	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Metate	0	0.0	0	0.0	0	0.0	0	0.0	1	26.0
Celt	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Abrader	0	0.0	0	0.0	0	0.0	0	0.0	1	108.1
Hematite	0	0.0	3	2.7	0	0.0	0	0.0	0	0.0
Limestone	21	8289.5	150	23730.1	26	1500.4	0	0.0	331	16024.0
FCR	0	0.0	7	43.9	0	0.0	0	0.0	9	50.1
Pebbles	0	0.0	1	0.5	1	1.4	0	0.0	3	4.1
Sandstone	0	0.0	0	0.0	0	0.0	0	0.0	6	41.0
Igneous	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unworked Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Granite	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Unident. Stone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fossil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Discoidal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Worked Limest.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tested cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Rough cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Stone bead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chert cobble	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mudstone	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Burin	0	0.0	0	0.0	0	0.0	0	0.0	1	3.1
Total Non-Ch.	21	8289.5	162	23867.8	27	1501.8	0	0.0	352	16256.4

APPENDIX D.
LITHIC ATTRIBUTES

CHERT TOOLS	F.270	F.270Wt
Rough Biface	0	0.0
Thick Biface	0	0.0
Thin Biface	0	0.0
End Scraper	0	0.0
Ret. Flake	0	0.0
Ret. Blade	0	0.0
Hafted Scraper	0	0.0
Perforator	0	0.0
Hoe	0	0.0
Proj. Point	0	0.0
Hammerstone	0	0.0
Wedge	0	0.0
Total Tools	0	0.0
CHERT CORES		
P/C Core	0	0.0
M/D Core	0	0.0
Bipolar Core	0	0.0
Unidirectional	0	0.0
Exhausted	0	0.0
Core fragment	0	0.0
Total Cores	0	0.0
DEBITAGE		
Primary Flake	2	2.7
Second. Flake	2	5.3
Tertiary Flake	4	3.4
Biface Thin. Flk.	0	0.0
Bipolar Flake	1	1.6
Broken Flake	5	5.1
Blade	1	17.2
Shatter	4	8.0
Hoe flake	0	0.0
Nodules	0	0.0
Piece esquillee	0	0.0
Total Debitage	**19**	**43.3**
NON-CHERT		
Hammerstone	0	0.0
Pitted Cobble	0	0.0
Mano	0	0.0
Metate	0	0.0
Celt	0	0.0
Abrader	0	0.0
Hematite	0	0.0
Limestone	1	3.6
FCR	0	0.0
Pebbles	0	0.0
Sandstone	0	0.0
Igneous	0	0.0
Unworked Stone	0	0.0
Granite	0	0.0
Unident. Stone	0	0.0
Fossil	0	0.0
Discoidal	0	0.0
Worked Limest.	0	0.0
Tested cobble	0	0.0
Rough cobble	0	0.0
Stone bead	0	0.0
Chert cobble	0	0.0
Mudstone	0	0.0
Stone pipe frgm	0	0.0
Total Non-Ch.	**1**	**3.6**

APPENDIX E.

CHERT RAW MATERIAL

APPENDIX E.
CHERT RAW MATERIAL

	FEATURE 1-2		FEATURE 5		FEATURE 21		FEATURE 23	
CHERT TYPES	N	W(G)	N	W(G)	N	W(G)	N	W(G)
Burlington/Keokuk	105	175.1	106	871.6	268	634.4	485	2940.8
Cobden/Dongola	1	2.4	1	0.2			10	79.8
Fern Glen	32	164.5	70	716.2	69	270	363	2483.8
Kaolin	4	4.3	2	0.6	9	30	5	4.7
Kincaid					3	2.9	3	2.2
Mill Creek	2	1.4	3	25.3	5	6.5	7	13.7
Salem	95	477.6	117	1149.8	164	1191.4	258	3512.9
St. Genevieve	58	114.1	104	245.8	28	70.3	156	530.8
St. Louis	13	34	23	241	16	209.9	29	133.5
Elco/Dover					2	6.2		
BURNT	14	10	40	47.9	96	88.9	317	474.9
OTHER	17	31.3	22	449.3	10	5.4	73	154.9

	FEATURE 36		FEATURE 61		FEATURE 64		FEATURE 79	
CHERT TYPES	N	W(G)	N	W(G)	N	W(G)	N	W(G)
Burlington/Keokuk	186	535.7	66	285.4	109	345.4	281	1578.3
Cobden/Dongola	1	0.2	1	0.1	5	6	6	8
Fern Glen	206	1050.5	95	440.4	67	209.3	290	2239.9
Kaolin			2	1.2	12	5	7	77.6
Kincaid			5	36.8	1	0.2	1	1.1
Mill Creek	11	26.5					9	29
Salem	180	1984.8	155	951.5	103	174.4	345	2045.7
St. Genevieve	72	196	20	44	26	32.2	83	220.7
St. Louis	133	859.1	15	116	14	106.6	15	191.2
Elco/Dover								
BURNT	71	73.8	143	281.5	142	188.7	310	318.2
OTHER	43	98.7	24	46	21	16.1	72	231.1

	FEATURE 87		FEATURE 103		FEATURE 104		FEATURE 113	
CHERT TYPES	N	W(G)	N	W(G)	N	W(G)	N	W(G)
Burlington/Keokuk	58	128.1	18	56.5	8	57.1	171	139.4
Cobden/Dongola	1	1.8						
Fern Glen	41	343.9	10	61.5	29	110.4	14	27.8
Kaolin	1	0.1						
Kincaid	1	1						
Mill Creek							5	34.5
Salem	54	392.8	8	13	11	133.8	121	445.1
St. Genevieve	14	39.5	2	4	3	14.8	1	0.2
St. Louis			2	2.1			7	18.5
Elco/Dover								
BURNT	20	55.6	2	7.5	11	29.6	32	43.4
OTHER	15	189.6			6	15.2	2	0.8

APPENDIX E.
CHERT RAW MATERIAL

	FEATURE 119		FEATURE 126		FEATURE 127		FEATURE 133	
CHERT TYPES	N	W(G)	N	W(G)	N	W(G)	N	W(G)
Burlington/Keokuk	223	943.4	53	133.2	192	379.1	13	17
Cobden/Dongola					19	20		
Fern Glen	175	860.2	31	235.3	510	1408	6	34.1
Kaolin			2	2.8				
Kincaid	1	2.8	2	6.2	3	2.8		
Mill Creek	2	0.8	1	3.5	2	1.3	1	5.2
Salem	293	1283.5	66	455	148	377.1	10	28.1
St. Genevieve	46	105.8	24	87.8	55	97.5		
St. Louis	11	93.6	3	16.6	3	16.9		
Elco/Dover								
BURNT	40	70.2	88	140.8	36	27.6	5	14.2
OTHER	12	27.2	4	5.2	31	21.9		

	FEATURE 139		FEATURE 140		FEATURE 141		FEATURE 149	
CHERT TYPES	N	W(G)	N	W(G)	N	W(G)	N	W(G)
Burlington/Keokuk	48	29.4	263	113.2	188	743.3	34	74.6
Cobden/Dongola	1	0.6			1	7.2		
Fern Glen	20	42.1	13	12.3	94	302.2	14	96.7
Kaolin	3	0.8						
Kincaid	2	9.6			1	62.1		
Mill Creek	2	12.3						
Salem	41	65.5	185	232.9	329	2202	66	532.9
St. Genevieve	5	18.6	1	0.2	29	42	1	3.4
St. Louis			2	5.8	24	150	3	16.3
Elco/Dover								
BURNT	29	21.6	59	95.9	109	133.1	25	17.1
OTHER	17	82.7			23	35.7	7	59.3

	FEATURE 154		FEATURE 178		FEATURE 182		FEATURE 210	
CHERT TYPES	N	W(G)	N	W(G)	N	W(G)	N	W(G)
Burlington/Keokuk	148	1667.3	63	117.3	75	91.6	97	144.7
Cobden/Dongola	1	13.5						
Fern Glen	75	2043.1	39	247.1	31	135.8	60	218.9
Kaolin	1	0.1						
Kincaid			1	0.7				
Mill Creek	7	6.5			1	201.8	2	2.3
Salem	292	3176.7	74	451.4	116	1464.9	122	810.6
St. Genevieve	28	109.4	11	20.6	11	22.2	17	113.1
St. Louis	5	35.2	3	10.2			4	3.9
Elco/Dover								
BURNT	108	178	49	56.4	93	86	86	120.2
OTHER	9	301.9	8	18	20	77.4	8	11.7

APPENDIX E.
CHERT RAW MATERIAL

	FEATURE 215		FEATURE 223		FEATURE 235		FEATURE 236	
CHERT TYPES	N	W(G)	N	W(G)	N	W(G)	N	W(G)
Burlington/Keokuk	8	5.6	178	1366.1	46	69.3	185	567
Cobden/Dongola								
Fern Glen	3	3.2	22	56	29	135.6	90	419.8
Kaolin			1	10.5			3	2.8
Kincaid							1	11.6
Mill Creek			1	0.5				
Salem	23	11.6	106	397.6	78	271.8	166	714.4
St. Genevieve			12	32.2	1	0.1	43	47.4
St. Louis					1	0.5	2	5.4
Elco/Dover								
BURNT	27	12.3	46	47.4	41	64.7	142	186.2
OTHER							13	19

	FEATURE 258		FEATURE 269		*TOTALS*	
CHERT TYPES	N	W(G)	N	W(G)	*N*	*W(G)*
Burlington/Keokuk	64	203.2	43	202.2	*3782*	*14615.3*
Cobden/Dongola			2	1.6	*50*	*141.4*
Fern Glen	15	71.1	13	153.6	*2526*	*14593.3*
Kaolin					*52*	*140.5*
Kincaid					*25*	*140*
Mill Creek					*61*	*371.1*
Salem	59	390	76	692.9	*3861*	*26031.7*
St. Genevieve	9	22.4	1	0.4	*861*	*2235.5*
St. Louis	2	25.3	3	63.9	*333*	*2355.5*
Elco/Dover					*2*	*6.2*
BURNT	28	64.3	45	112.4	*2254*	*3068.4*
OTHER	4	9.1	3	14.9	*464*	*1922.4*

APPENDIX F.

MORTUARY ATTRIBUTES

Feature 19: Skeleton 1   Age: adult   Sex: undetermined

Feature 19 was initially defined during the excavation of the original test trench during the Phase II investigations conducted in June 1994. When bone was observed, the feature was covered for later evaluation.

Feature 19 was redefined in August 1994. Poorly preserved bone representing the loosely flexed primary burial of an adult was identified on the scraped surface of a pit feature. Skeleton 1 was positioned on the right side, with the knees loosely flexed to the right and the skull oriented to the west. Portions of the skull, right humerus, ribs, femora, tibiae, and fibulae were identified in the field and removed in matrix. Small fragments of radius, ulna and mandible also were tentatively identified. A profile trench had destroyed portions of the pelvis and possibly the lower portion of the arms.

Because of the very poor preservation and fragmentary nature of these remains, identification of elements was made while the remains were in situ. Only small unidentifiable bone fragments were recovered. The size of Skeleton 1 observed in the field suggests that this individual was an adult. No further assessment of age or sex is possible. No metric or nonmetric observations were made. No pathologies were observed due to the extremely poor condition of the remains.

Feature 184: Skeleton 2   Age: undetermined   Sex: undetermined

Feature 184 was identified as three very poorly preserved, possibly articulated long bones on the scraped surface of the site. No feature outline was evident. The size, morphology and apparent articulation of these elements, together with their location in the mortuary area of the site, suggest the remains are human. No further demographic information is available. Elements of Skeleton 2 were removed in matrix. Identification of elements and burial reconstruction are not possible.

Feature 185: Skeleton 3   Age: adult   Sex: undetermined

The poorly preserved remains of Skeleton 3 consist of unidentified long bone fragments, outlines of metatarsals at the south end of the feature, and a fragmented tooth and skull fragments at the north end of the feature. The size and position of elements within Feature 185 suggest they represent the loosely flexed, primary burial of an adult.

The poor preservation of Skeleton 3 precluded more refined age estimates. No sex determination was possible, nor was it possible to assess the health status of this individual. It also was not possible to determine whether the lack of skeletal elements reflects preservational biases or mortuary activity.

Feature 188: Skeleton 4   Age: adult   Sex: undetermined

Feature 188 represents a limestone box grave. Horizontally positioned limestone slabs were encountered approximately 16 cm below the graded surface. These stones abutted a vertically positioned stone that formed the south end of the pit. The entire floor of Feature 188 had been paved with limestone. Poorly preserved human bone was located within the stone box grave. These elements of Skeleton 4, identified in the field as ribs, vertebrae, hand and/or foot elements, and possible pelvic fragments, were removed in matrix. The ribs and vertebrae (cervical and thoracic) were recovered primarily from the central portion of the feature. Additional elements, including metatarsals and possible ilia, were recovered in the laboratory. No cranial, dental, or long bone elements were recovered.

The size and morphology of the vertebral elements suggests that Skeleton 4 was an adult; the sex is undetermined. No pathologies were observed. The preservation of these remains is surprisingly poor given the quantity of limestone within this feature. It is suggested that Feature 188 may have been disturbed prehistorically; cranial elements and long bones may have been removed while smaller elements of the hands, feet, and thorax were left behind.

Feature 192: Skeleton 5 Age: 8–11 years Sex: undetermined

While taking a flotation sample from the center of the Feature 192, a fragment of mandible with teeth was identified and removed in matrix. No other bone was present within this feature. The position and development of identified teeth suggest that Skeleton 5 was aged between 8 and 11 years old. It is not clear whether the absence of additional skeletal elements is a result of mortuary activities or due to poor preservation.

Feature 195:

Feature 195 was defined as an oblong pit measuring 137-x-68 cm. Three limestone slabs were exposed on the surface of the feature. Isolated human teeth were encountered approximately 6 cm below surface. Further excavation revealed a skull and disarticulated postcranial remains. These remains were well-preserved, and the elements themselves fairly complete. A field estimation of three Skeletons—two adults and one infant—was based on the presence of three mandibles. Postcranial remains of at least two adult individuals also were recovered. The long bones were tightly bundled and oriented predominately east/west with the majority of proximal ends oriented towards the west. Ribs, vertebrae (some of which appear to have been articulated), scapulae, clavicles, hand and foot elements, and pelvic remains of two adults also were recovered.

Skeleton 6 Age: 35+ years Sex: female

Skeleton 6, the larger of the two adults identified in Feature 195, is represented by a mandible, right humerus, radius and ulna, a small fragment of the left ulna, right and left scapulae and clavicles, ribs, and cervical, thoracic, and sacral vertebrae.

Antemortem tooth loss and a moderately high degree of dental attrition, combined with degenerative changes of the articular margins of the glenoid cavities of the scapulae and the articular facets of the ribs, as well as degenerative changes of the articular surfaces of the distal humerus and distal ulna suggest that Skeleton 6 was an older individual (35+). Mandibular morphology suggests that Skeleton 6 is female. Mandibular and postcranial measurements were taken and are presented in the following tables.

Six teeth were examined for linear enamel hypoplasias (LEHs), or lines of arrested growth. Two of six teeth (premolar and canine) examined had LEHs indicating a period of nutritional or disease stress during early childhood. Two carious lesions were noted on interproximal aspects of the right first molar.

Antemortem tooth loss is indicated by the complete resorption of alveolar bone associated with the second mandibular molars, and nearly complete resorption of alveolar bone associated with the left first molar.

Skeleton 7   Age: 19–25 years   Sex: female

Skeleton 7 is represented by a skull and articulated mandible. Postcranial elements attributed to Skeleton 7 include clavicles, scapulae, humeri, radii, cervical, thoracic, lumbar and sacral vertebrae, innominates, and ribs. The pelvis attributed to Skeleton 7 further suggests that elements of the lower extremities (femora, tibiae, fibulae, right patella and foot elements) also should be attributed to this individual. The postcranial remains attributed to Skeleton 7 are slightly smaller, more gracile, and show less evidence of degenerative change than those attributed to Skeleton 6.

A wide sciatic notch and cranial and mandibular morphology, combined with gracility of postcranial elements, suggests that Skeleton 7 is female. The age of this individual is estimated to be less than 30 years. While the maxillary third molars are absent, the mandibular third molars are fully erupted and evidence slight to moderate wear. The articulation of maxillary and mandibular dentition suggests that the maxillary third molars are congenitally absent. The postcranial epiphyses of Skeleton 7 are all completely fused, suggesting an age in the mid-twenties. The lack of degenerative changes of the auricular surface of the right ilium attributed to this individual suggests an age between 19 and 25 years.

Lines of arrested growth were observed on 13 of 19 teeth present in Skeleton 7. Eight teeth had at least two LEHs, indicating periods of nutritional or disease stress in early childhood. Of the nineteen teeth present, one small carious lesion was present on the occlusal surface of the right mandibular third molar. Calculus was noted on the anterior maxillary dentition.

The morphology of the skull and other qualitative traits observed, including the presence of shoveled incisors, suggest a Mongoloid racial affiliation. Cranial, postcranial, and dental measurements were taken and are presented in the following tables.

The relative completeness of Skeleton 7 and the inclusion and positioning of small elements of the feet suggest partial articulation of this individual at the time of final interment. The lower extremities were at the base of the burial pit, the pelvic remains lay on top of elements of legs and below elements of upper body, and the skull and mandible lay on the top; ribs and vertebrae were scattered throughout, and some vertebrae appear to have been articulated. The disarticulated remains of Skeletons 6 and 8 generally were located above those of Skeleton 7.

Skeleton 8   Age: 1 year ± 4 mos   Sex: undetermined

Skeleton 8 is represented by a mandible found nested within the mandible of Skeleton 7. No postcranial elements were associated with this individual. An estimated age of 1 year ± 4 months is based on the development and eruption of the dentition. No carious lesions were present on the one tooth observed. The lingual surface of this tooth (the right central deciduous incisor) does have a pitted line of arrested growth, suggesting a period of stress in utero or during early infancy.

Feature 195, which lies slightly outside of the main burial area, represents the only clearly identified bundle burial of multiple individuals at the Stemler Bluff site. The significance of this location and the burial treatment is unknown. It may reflect temporal or cultural differences between the Feature 195 interment and other burials at the site.

Feature 198: Skeleton 9 Age: adult Sex: female

Feature 198 was identified by limestone slabs exposed following machine scraping. Articulated, poorly preserved lower limb bones were identified in the north half of the feature beneath the slabs, approximately 10 cm below datum. All skeletal elements were removed in matrix. Skeleton 9 is represented by fairly well-preserved portions of the sacrum and left innominate, shaft fragments (c. 10 cm) of the left femur, tibia and fibula, and right tibia, and fragments of at least one vertebra (identified in the laboratory). The upper portion of the body (cranial elements, arms, etc.) was not present and may have been removed prehistorically.

The size of skeletal elements and the wide sciatic notch suggests that Skeleton 9 was an adult female. Very few postcranial measurements are available. No pathologies were observed on the few elements present. While the nature of this burial is not clear, the partial articulation and apparent position of Skeleton 9 suggest that Feature 198 may represent a prehistorically disturbed primary burial.

Feature 204:

Skeleton 10 Age: undetermined Sex: undetermined

Very poorly preserved human remains were found at the bottom of Feature 204. The unidentified long bones of Skeleton 10 were located in the northeast portion of the pit. The size and position of elements suggest they may be femora. These were removed as flotation samples. Only tiny unidentifiable bone fragments were recovered from flotation samples. The age and sex of Skeleton 10 are undetermined. Burial reconstruction is not possible due to the extremely poor preservation of this individual.

Feature 216: Skeleton 11 Age: adult Sex: undetermined

Skeleton 11 was lying supine with the head towards the west, the knees were drawn up and resting against the sidewalls of the pit, and the arms were extended prone with the hands positioned over the pelvic region between the legs. The bone preservation was very poor. The cranium and mandible were removed in matrix. The cranium is still in matrix since no recoverable bone is present. Two isolated tooth crowns also were recovered. Poorly preserved vertebrae were observed in the field in anatomical position (running town the midline of the grave) but were not recoverable. Traces of metacarpals also were noted within the pelvic region but were not recoverable.

The position and completeness of Skeleton 11 indicates that this is a primary burial of a single individual. The size of the elements recovered suggests that Skeleton 11 is an adult. It is not possible to determine the sex of this individual. No pathologies are observable and no nonmetric observations are possible. Very few measurements were taken due to the extreme fragmentation and poor preservation of the bone.

Feature 217: no skeleton # Age: undetermined Sex: undetermined

Feature 217 is a rectangular pit (92-x-80 cm) that was oriented north-south. Charcoal concentrations indicate that wood once lined the east and west walls of this pit. One small bone fragment was found at the northwest edge of this pit. The bone was not identifiable and was not observed in the laboratory. No further information is available. No skeleton number was assigned. The location of Feature 217 in the mortuary area of the site, its similarities to other graves in this area, and the presence of fragmentary bone within this feature suggest it should be included in discussions of features "with bone."

Feature 218: no skeleton # Age: undetermined Sex: undetermined

Feature 218 is a small (54-x-25 cm) oval pit that was oriented north-south. Bone fragments were removed in a flotation sample but not observed in the laboratory. No further information is available. No skeleton number was assigned. The location of Feature 218 in the mortuary area of the site, its similarities to other graves in this area, and the presence of fragmentary bone within this feature suggest it should be included in discussions of features "with bone."

Feature 240: Skeleton 12 Age: 1 year ± 4 mos Sex: undetermined

The teeth of Skeleton 12 were identified 10.5 cm below datum, at the south end of Feature 240. Skeleton 12 is represented by articulated maxillary and mandibular dentition removed in matrix. The identification of a deciduous canine, the extremely thin and fragile enamel, and the lack of evidence for permanent tooth buds suggest an age of approximately one year (± 4 months). No further observations are possible. No postcranial elements were identified; their absence is likely attributed to poor preservation.

Feature 241: Skeleton 13 Age: adult Sex: undetermined

Feature 241 contained the poorly preserved remains of an extended primary burial (Skeleton13), positioned with the head to the southwest. The teeth were encountered approximately 40 cm below datum. The maxilla and mandible of Skeleton 13 were removed in matrix while the remainder of the skull was removed as a flotation sample. A portion of the left humerus was recovered. Only traces of the pelvic region and bones of the legs were present and were removed as a flotation sample.

Very little bone was recovered from this burial feature. The maxilla and mandible remain in matrix. The third molars of Skeleton 13 have erupted and show moderate wear, indicating that this individual was an adult. It was not possible to determine sex. Very few mandibular measurements were taken due to the incomplete nature of the remains. No carious lesions were observed on exposed portions of the dentition. However, encasing soil matrix prevents the observation of the lingual and interproximal surfaces of most teeth. Three of 11 teeth observed had a single LEH, indicating a period of nutritional or disease stress during early childhood. The incisors of Skeleton 13 are shoveled, a trait consistent with a Mongoloid racial affiliation.

The central maxillary incisors of Skeleton 13 show evidence of cultural modification. A central notch extends slightly less than .20 cm into the incisal surface of both teeth. These notches were more marked on the labial than lingual surface. Similarly notched teeth have been recovered from a number of American Bottom sites (Milner and Larsen 1991).

Feature 242: Skeleton 14 Age: child Sex: undetermined

The outline of a skull was identified within the southern wall profile of Feature 242. The cross-sectioned skull was small with very thin cortex. The thin cortex suggests that Skeleton 14 was a child, but no further information is available. Only a few small cranial fragments were recovered.

Feature 243: Skeleton 15   Age: adult   Sex: undetermined

Limestone slabs lined the north and south walls of Feature 243, and traces of burned wood were observed along the east and west walls. Cranial remains were identified 22 cm below datum at the south end of the burial feature, and very badly decomposed traces of the femora, tibiae, and foot elements were present in the north half of Feature 243, indicating that Skeleton 15 had been placed in an extended position. Portions of the cranium, including dentition, and tibiae were removed in matrix while the femora and feet were unrecoverable. The upper portion of the body (arms and thorax) was not preserved.

While most of the skeletal elements remain in soil matrix and are therefore unanalyzable, a number of teeth were recovered. The degree of attrition observed on the mandibular second and third molars indicates that Skeleton 15 was an adult. The sex of this individual cannot be determined. Three of eleven teeth observed for LEHs evidenced lines of arrested growth. The left maxillary canine was most severely affected with three episodes of arrested growth, indicating periods of nutritional or disease stress from infancy through early childhood. Ten teeth were complete enough to observed for carious lesions. No carious lesions were present.

Feature 244: Skeleton 16   Age: adult   Sex: undetermined

Human remains were encountered approximately 20 cm below datum, at the base of Feature 244. Very poorly preserved traces of a skull were located at the west end of this feature, 20 cm below datum. Unidentified bone was encountered 19 cm below datum, approximately 30 cm east of the skull, and a decomposed articulated femur and tibia were identified 17 cm below datum in the east half of the feature. The position of these elements indicates that Skeleton 16 had been interred as a loosely flexed primary burial, placed on its left side. The bone was very poorly preserved; all elements were removed in matrix. The elements recovered remain in matrix and are unidentifiable apart from the identifications made in the field. The size of Skeleton 16 suggests that this individual was an adult, but it is not possible to determine sex. Poor bone preservation prevented any additional analysis of the remains.

Feature 248: Skeleton17   Age: undetermined   Sex: undetermined

Feature 248 contained a very faint and ambiguous outline of a possible long bone, located approximately 10 cm below datum in the north end of the feature. No skeletal material was recovered from this burial due to poor preservation. No further information is available.

Feature 250: Skeleton 18   Age: 3 years ± 12 mos   Sex: undetermined

Feature 250 was located after machine stripping exposed limestone and a small area of bone. The size and position of the identifiable elements suggests that Skeleton 18 was interred in a flexed position on its left side, with its head to the south. Skeleton 18 consists of an articulated skull and mandible of a child, along with unidentifiable bone traces (possibly humerus and ribs). The postcranial elements were not recoverable. The skull and mandible were removed in matrix. Both bone and teeth were extremely soft due to poor preservation.

A portion of the frontal bone, the left orbital region, and the left zygomatic were recovered in the laboratory. The bone is very thin and obviously that of a child. The eruption and development stage of the teeth indicate an age of 3 years ± 12 months. The deciduous maxillary incisors are shoveled, suggesting a

Mongoloid racial affiliation. Buccal pitting is present on the deciduous mandibular second molars.

Carious lesions are present on four of the 13 teeth observed. The lateral maxillary incisors have large carious lesions, apparently originating on the labial surface of the tooth and have destroyed nearly one-half of the crown. The central maxillary incisors have three to four small caries in a linear pattern on the labial surface of both teeth. One line of arrested growth, expressed by linear pitting across the labial surface of the right maxillary canine, suggests that the carious lesions are secondary to hypoplastic events. This suggests that Skeleton 18 experienced a period of nutritional or disease stress in utero or during early infancy.

Feature 253: Skeleton 19   Age: 3 years ± 12 mos   Sex: undetermined

The teeth of Skeleton 19 were located in the center of the pit feature, beneath a large limestone-tempered sherd approximately 5 cm below datum. No other bone was observed in this feature. Unerupted permanent mandibular tooth buds and a deciduous left second molar were recovered. The dental development observed indicates an age of 3 years ± 12 months. Slight shoveling of the left lateral incisor is observable, suggesting a Mongoloid racial affiliation. Buccal pitting also was observed on the left mandibular permanent second molar.

Differential preservation at the site, and within the burial features themselves, complicates the reconstruction of burial practices. Skeleton 19 may have been a primary burial within Feature 253, with only portions of the mandibular dentition preserving. Alternatively, the mandible of Skeleton 19 may have been buried alone with the sherd, or the sherd and the mandible may have been left behind when other remains were removed. A final possible scenario is that the mandible and sherd may have been swept into the pit during the cleaning of burial area.

Feature 262: Skeleton 20   Age: undetermined   Sex: undetermined

Poorly preserved unidentifiable bone was recovered from Feature 262. The bone (Skeleton 20) remains in matrix. No identification is possible, and no further information has been obtained regarding this individual.

Feature 36: Bag 256, 6-liter light fraction

One possible human phalanx was found in the light fraction flotation sample. The specimen is a very eroded unidentifiable tarsal/carpal size element, with a size and density consistent with human but not definitely identifiable as such. The abundance and nature of material in this feature indicates its function was not mortuary. The inclusion of the potential human phalanx in the fill of this feature was most likely incidental.

Feature 229, E ½: Bag 1033, General Excavation

An isolated maxillary molar was recovered from this feature. The roots are partially fused and the tooth lacks a posterior articular facet, suggesting that it is an M3 rather than an M2. The tooth is worn flat indicating the individual was an adult, likely over 35 years of age. Tartar/calculus covers much of tooth crown, again indicative of posterior dentition (M3). Two carious lesions are present. A moderately large lesion is present at the cemento-enamel junction (CEJ), anterior and interproximal surface, and a smaller lesion is present posteriorly on the buccal surface at the CEJ. A small enamel pearl is present on the anterior root, 3 cm below the CEJ. Very slight enamel extensions are also present. No linear enamel hypoplasias (LEHs) were observed. The tooth appears to be an incidental inclusion within Feature 229.

Feature 142, W ½: Bag 442, General Excavation

This specimen is an isolated incisiform tooth. Based on its atypical crown shape, degree of attrition, and length and completeness of root, this is a supernumary tooth (total tooth length, crown to root tip is 2.19 cm). Articular facets are present on anterior and posterior surfaces, suggesting that the tooth was positioned within the dental arcade. Crown wear is lingual, indicating a maxillary tooth. The degree of attrition (score of 5 on Smith scale) suggests the tooth represents an adult. A small amount of tartar is present at CEJ/gum line. No LEHs or carious lesions are present.

APPENDIX F.
MORTUARY ATTRIBUTES
(Skeletal Inventory)

ELEMENT:		F. 19 Sk. 1	F. 184 Sk. 2	F. 185 Sk. 3	F. 188 Sk. 4	F. 192 Sk. 5	F. 195 Sk. 6	F. 195 Sk. 7	F. 195 Sk. 8	F. 198 Sk. 9	F. 204 Sk. 10	F. 216 Sk. 11
						no bone recovered						
Cranium		in matrix						1/0				
Mandible							1/0	1/0	1/0			
Clavicle	L				in matrix		1/DJD	1/0				
	R						1/0	1/0				
Scapula	L				3/*		1/DJD	2/0				
	R						1/DJD	2/0				
Humerus	L							1/0				
	R						1/0	1/0				3/*
Radius	L	3/*						1/0				3/*
	R						1/0	1/0				3/*
Ulna	L	3/*					1/0					3/*
	R						1/0					3/*
Hands								1 metacarpal				
Pelvis	L				in matrix			2/0		3/0		
	R							2/0				
Femur	L	3/*		3/*				2/0		2/0		2/*
	R	3/*						2/0				2/*
Tibia	L	3/*						2/0		2/0		3/*
	R	3/*						2/0		2/0		
Fibula	L	3/*						2/0		3/0		3/*
	R	3/*						2/0				
Patella	L											
	R							1/0				
Feet							few elements	present				
Vertebrae					in matrix		present	present		fragments		
Ribs					in matrix		15 ribs/DJD	9 ribs/0				
Longbones			in matrix	fragments								
Unidentified											fragments	

† skeletal completeness:
1: > 75% complete
2: 25-75% complete
3: <25% complete

pathologies:
*: unobservable
0: no pathologies
DJD: arthritis

APPENDIX F.
MORTUARY ATTRIBUTES
(Skeletal Inventory)

		F. 217 no Sk. #	F. 218 no Sk. #	F. 240 Sk. 12	F. 241 Sk. 13	F. 242 Sk. 14	F. 243 Sk. 15	F. 244 Sk. 16	F. 250 Sk. 18	F. 253 Sk. 19	F. 262 Sk. 20
ELEMENT:				no bone recovered							
Cranium					maxilla in matrix	fragments	in matrix		3/*		
Mandible					in matrix 2/0				3/0		
Clavicle	**L**										
	R										
Scapula	**L**										
	R										
Humerus	**L**				fragments						
	R										
Radius	**L**										
	R										
Ulna	**L**										
	R										
Hands							in matrix				
Pelvis	**L**										
	R										
Femur	**L**							in matrix			
	R										
Tibia	**L**						2/*				
	R						2/*				
Fibula	**L**						3/*	in matrix			
	R						3/*				
Patella	**L**										
	R										
Feet							few elements	in matrix			
Vertebrae											
Ribs											
Longbones											
Unidentified		fragments	fragments					in matrix		fragments	in matrix

† skeletal completeness:
1: > 75% complete
2: 25-75% complete
3: <25% complete

pathologies:
*: unobservable
0: no pathologies
DJD: arthritis

APPENDIX F.
MORTUARY ATTRIBUTES
(Dental Inventory)

	F. 192 Sk. 5	F. 195 Sk. 6	F. 195 Sk. 7	F. 195 Sk. 8	F. 216 Sk. 11	F. 241 Sk. 13	F. 243 Sk. 15	F. 250 Sk. 18	F. 253 Sk. 19
MAXILLA									
RM3	*	*	6/0	*	*	*	*	*	*
RM2	*	*	2/1	*	*	8/1	*	*	*
RM1	*	*	2/1	*	*	8/1	2/1	*	*
RP2	*	*	3/0	*	*	8/1	2/1	*	*
RP1	*	*	3/0	*	*	8/1	8/1	*	*
RC	*	*	2/15	*	*	8/1	*	1/5	*
RI2	*	*	2/15	*	*	8/1	*	*	*
RI1	*	*	2/15	*	*	2/1	*	*	*
LI1	*	*	2/15	*	*	2/1	*	*	*
LI2	*	*	2/15	*	*	2/1	*	*	*
LC	*	*	2/1	*	*	2/1	2/1	*	*
LP1	*	*	2/15	*	*	2/1	2/1	*	*
LP2	*	*	2/15	*	*	2/1	2/1	*	*
LM1	*	*	2/1	*	*	2/1	2/1	1/1	*
LM2	*	*	2/1	*	2/1	2/1	2/1	*	*
LM3	*	*	6/0	*	*	2/1	*	*	*
MANDIBLE									
RM3	*	3/*	2/1	*	*	2/1	2/1	*	*
RM2	1/1	5/*	7/1	*	*	8/1	*	*	*
RM1	2/1	2/1	2/1	*	*	2/1	*	1/7	*
RP2	*	2/1	2/1	*	*	2/1	2/1	*	*
RP1	*	2/15	3/*	*	*	8/1	2/1	*	*
RC	*	3/*	3/*	*	*	2/1	*	*	*
RI2	*	3/*	3/*	*	*	2/1	*	*	*
RI1	*	3/*	3/*	*	*	8/1	8/1	*	1/1
LI1	*	3/*	3/*	*	*	8/1	8/1	*	1/1
LI2	*	3/*	3/*	*	*	8/1	*	*	1/7
LC	*	2/1	2/1	*	*	8/1	*	*	1/6
LP1	*	2/1	3/*	*	*	2/1	2/1	*	*
LP2	1/1	3/*	3/*	*	*	2/1	2/1	*	*
LM1	2/1	5/*	2/1	1/4	2/1	2/1	*	1/7	*
LM2	1/1	5/*	2/*	*	*	2/1	2/1	*	*
LM3	*	2/1	2/1	*	*	2/1	2/1	*	*

†Standard methods presented in Buikstra and Ubelaker (1994)

	F. 195 Sk. 8	F. 250 Sk. 18
MAXILLA		
rm2	*	1/1
rm1	*	1/1
rc	*	1/1
ri2	*	1/1
ri1	*	1/1
	*	
li1	*	1/13
li2	*	1/1
lc	*	*
lm1	*	1/13
lm2	*	1/1
MANDIBLE		
rm2	3/*	1/1
rm1	1/9	1/1
rc	1/9	1/1
ri2	3/*	*
ri1	2/12	*
li1	3/*	7/*
li2	3/*	1/1
lc	1/9	1/1
lm1	1/9	1/12
lm2	1/7	1/1

Dental Inventory/Development Coding:

Inventory Codes:
- * Missing, no associated alveolar bone
- 1 Present, not in occlusion (erupting)
- 2 Present, in occlusion (development complete)
- 3 Missing, no alveolar resorption (post-mortem loss)
- 4 Missing, partial alveolar resorption (possible ante-mortem loss)
- 5 Missing, complete alveolar resorption (ante-mortem loss)
- 6 Missing, congenital absence
- 7 Root only
- 8 Enamel fragments

Development Codes:
- * No data, not observed
- 1 Crown Complete, root development not observed
- 2 Initial cusp formation
- 3 Coalescence of cusps
- 4 Cusp outline complete
- 5 Crown 1/2 complete
- 6 Crown 3/4 complete
- 7 Crown complete
- 8 Initial root formation
- 9 Initial cleft formation
- 10 Root length 1/4
- 11 Root length 1/2
- 12 Root length 3/4
- 13 Root length complete
- 14 Apex 1/2 closed
- 15 Apex closed

APPENDIX F.
MORTUARY ATTRIBUTES
(Age Estimation-Smith and Scott)

	F. 192 Sk. 5		F. 195 Sk. 6		F. 195 Sk. 7		F. 216 Sk. 11		F. 241 Sk. 13		F. 243 Sk. 15		F. 250 Sk. 18		F. 253 Sk. 19	
	Smith	Scott	Smith	Scott	Smith	Scott	Smith	Scott	Smith	Scott	Smith	Scott	Smith	Scott	Smith	Scott
MAXILLA																
RM3																
RM2					2	6										
RM1					2.5	11										
RP2											3					
RP1																
RC					3								0			
RI2					2											
RI1					3.5											
LI1					4				5							
LI2					2				4.5							
LC					2				5		4					
LP1					1				4.5		3					
LP2					1				3.5		3					
LM1					2	8			3	19			0			
LM2	0	0			1.5	5	2	13	3	18	3	16				
LM3									2.5	15						
MANDIBLE																
RM3					1	4					2	5				
RM2					2	6										
RM1			4	23	3	12							0			
RP2			2		2						3					
RP1			3													
RC																
RI2																
RI1																
LI1																
LI2																
LC			3.5		3											
LP1			3								3.5					
LP2	0	0									3					
LM1	1	5			2.5	10	4	19	3.5	17			0		0	
LM2	0	0							3	15	3.5	16				
LM3			2	14	1	4					2	5				

*As presented in Smith (1984) and Scott (1979).

	F. 185 Sk. 8		F. 250 Sk. 18		F. 253 Sk. 19	
	Smith	Scott	Smith	Scott	Smith	Scott
MAXILLA						
rm2			1	4		
rm1						
rc			1			
ri2						
ri1			2			
li1			2			
li2						
lc						
lm1						
lm2						
MANDIBLE						
rm2			1	4		
rm1						
rc						
ri2						
ri1	1					
li1						
li2			1			
lc			1			
lm1			1	4		
lm2			1	4	1	4

APPENDIX F.
MORTUARY ATTRIBUTES
(Dental Caries)

	F. 192 Sk. 5	F. 195 Sk. 8	F. 195 Sk. 7	F. 195 Sk. 6	F. 216 Sk. 11	F. 241 Sk. 13	F. 243 Sk. 15	F. 250 Sk. 18	F. 253 Sk. 19
MAXILLA									
RM3	*	*	*	*	*	*	*	*	*
RM2	*	*	0	*	*	*	*	*	*
RM1	*	*	0	*	*	*	*	*	*
RP2	*	*	*	*	*	*	0	*	*
RP1	*	*	*	*	*	*	*	*	*
RC	*	*	0	*	*	*	*	*	*
RI2	*	*	0	*	*	*	*	*	*
RI1	*	*	0	*	*	0	*	*	*
LI1	*	*	0	*	*	0	*	*	*
LI2	*	*	0	*	*	0	*	*	*
LC	*	*	0	*	*	0	0	*	*
LP1	*	*	0	*	*	0	0	*	*
LP2	*	*	0	*	*	0	0	*	*
LM1	*	*	0	*	*	0	*	*	*
LM2	*	*	0	*	0	0	0	*	*
LM3	*	*	*	*	*	0	*	*	*
MANDIBLE									
RM3	*	*	1/1.1	*	*	*	*	*	*
RM2	0	*	0	*	*	*	*	*	*
RM1	*	*	0	2/3.4	*	*	*	0	*
RP2	*	*	0	0	*	*	0	*	*
RP1	*	*	*	0	*	*	*	*	*
RC	*	*	*	*	*	*	*	*	*
RI2	*	*	*	*	*	0	*	*	*
RI1	*	*	*	*	*	*	*	*	0
LI1	*	*	*	*	*	*	*	*	0
LI2	*	*	*	*	*	*	*	*	0
LC	*	*	0	0	*	*	*	*	0
LP1	*	*	*	0	*	0	0	*	*
LP2	0	*	*	*	*	0	0	*	*
LM1	0	*	0	*	0	0	*	0	0
LM2	0	*	*	*	*	0	0	*	*
LM3	*	*	0	0	*	0	0	*	*

	F. 195 Sk. 8	F. 250 Sk. 18	F. 253 Sk. 19
MAXILLA			
rm2	*	0	*
rm1	*	*	*
rc	*	0	*
ri2	*	1/2.2	*
ri1	*	3/2.2	*
li1	*	3/2.2	*
li2	*	1/2.2	*
lc	*	*	*
lm1	*	*	*
lm2	*	0	*
MANDIBLE			
rm2	*	0	*
rm1	*	*	*
rc	*	0	*
ri2	*	*	*
ri1	0	*	*
li1	*	*	*
li2	*	0	*
lc	*	0	*
lm1	*	0	*
lm2	*	0	0

Carious Lesions, Location Coding:

Location Codes:
- * Not observed
- 1 Occlusal surface
- 2 Body face, non-occlusal
- 3 Cemento-enamel junction
- 4 Root

Subcodes:
- .1 Occlusal
- .2 Buccal
- .3 Lingual
- .4 Interproximal

APPENDIX F.
MORTUARY ATTRIBUTES
(Linear Enamel Hypoplasias)

	F. 192	Sk. 5	F. 195	Sk. 6	F. 195	Sk. 7	F. 195	Sk. 8	F. 216	Sk. 11	F. 241	Sk. 13	F. 243	Sk. 15	F. 253	Sk. 19
	count	location	count	location	count	location	count	location	count	location	count	location	count	location	count	location
MAXILLA																
RM3	*		*		*		*		*		*		*		*	
RM2	*		*		*		*		*		*		*		*	
RM1	*		*		1	0.09	*		*		*		0		*	
RP2	*		*		0		*		*		*		0		*	
RP1	*		*		*		*		*		*		*		*	
RC	*		*		2	0.28, 0.44	0		*		*		*		*	
RI2	*		*		2	0.31, 0.49	*		*		*		*		*	
RI1	*		*		2	0.29, 0.45	*		*		1	0.22	*		*	
LI1	*		*		2	0.30, 0.44	*		*		1	0.21	*		*	
LI2	*		*		2	0.26, 0.45	*		*		*		*		*	
LC	*		*		2	0.20, 0.37	*		*		*		3	0.26, 0.53, 0.69	*	
LP1	*		*		1	0.24	*		*		0		2	0.21, 0.43	*	
LP2	*		*		1	0.24	*		*		0		1	0.31	*	
LM1	*		*		1	0.18	0		*		1	0.39	*		*	
LM2	*		*		0		*		0		0		0		*	
LM3	*		*		*		*		*		0		*		*	
MANDIBLE																
RM3	*		*		0		*		*		*		*		*	
RM2	0		*		0		*		*		*		*		*	
RM1	*		0		0		0		*		*		*		*	
RP2	*		1	0.13	2	0.16, 0.44	*		*		0		*		*	
RP1	*		0		*		*		*		*		*		*	
RC	*		*		*		*		*		*		*		*	
RI2	*		*		*		*		*		*		*		*	
RI1	*		*		*		*		*		*		0		*	
LI1	*		*		*		*		*		*		*		0	
LI2	*		*		*		*		*		*		*		0	
LC	*		2	0.24, 0.41	2	0.31, 0.49	*		*		*		*		*	
LP1	*		0		*		*		*		0		0		*	
LP2	*		*		*		*		*		0		0		*	
LM1	0		*		1	0.15	0		0		0		*		0	
LM2	0		*		*		*		*		*		0		*	
LM3	0		0		*		*		*		*		0		*	

†Distance between LEH and cemento-enamel junction (cm).

APPENDIX F.
MORTUARY ATTRIBUTES
(Linear Enamel Hypoplasias-Subadults)

	F. 195 Sk. 8 count	location	F. 250 Sk. 18 count	location	F. 253 Sk. 19 count	location
MAXILLA						
rm2	*		0		*	
rm1	*		0		*	
rc	*		pits	0.44	*	
ri2	*		pits	0.34	*	
ri1	*		pits	0.33	*	
li1	*		pits	0.29	*	
li2	*		pits	0.37	*	
lc	*		0		*	
lm1	*		0		*	
lm2	*		0		*	
MANDIBLE						
rm2	*		0		*	
rm1	*		0		*	
rc	*		0		*	
ri2	*		*		*	
ri1	1	0.43	*		*	
li1	*		*		*	
li2	*		0		*	
lc	*		0		*	
lm1	*		0		*	
lm2	*		0		0	

†Distance measured (cm) between LEH and cemento-enamel junction.

APPENDIX F.
MORTUARY ATTRIBUTES
(Cranial Measurements)

Feature	F. 195 Sk. 6	F. 195 Sk. 7	F. 241 Sk. 13
Maximum Cranial Length	*	*	*
Maximum Cranial Breadth	*	*	*
Bizygomatic Diameter	*	12.4	*
Basion-Bregma Height	*	*	*
Maxillo-Alveolar Breadth	*	6.28	*
Maxilla-Alveolar Length	*	4.89	*
Biauricular Breadth	*	*	*
Upper Facial Height	*	6.03	*
Minimum Frontal Breadth	*	*	*
Nasal Heigth	*	5.04	*
Nasal Breadth	*	2.29	*
Orbital Height	*	3.37	*
Orbital Breadth	*	3.82	*
Biorbital Breadth	*	9.09	*
Interorbital Breadth	*	2.01	*
Foramen Magnum Length	*	2.91	*
Foramen Magnum Breadth	*	*	*
Mastoid Length	*	2.65	*
Mandible:			
Chin Height	2.95	2.89	*
Bigonial Width	9.95	*	*
Bicondylar Breadth	*	*	*
Minimum Ramus Breadth	3.07 (R)	3.32 (R)	2.94
Maximum Ramus Breadth	3.84 (R)	4.46 (R)	3.31
Maximum Ramus Height	5.04 (R)	5.91 (R)	5.99
Mandibular Length	10.5	9.8	*
Coronoid Height	5.68 (R)	5.97	*

†Standard measurements presented in Bass (1987) and Buikstra and Ubelaker (1994); all measurements taken on left side unless otherwise indicated

APPENDIX F.
MORTUARY ATTRIBUTES
(Postcranial Measurements)

Feature	F. 19 Sk. 1	F. 185 Sk. 3	F. 195 Sk. 6	F. 195 Sk. 7	F. 198 Sk. 9	F. 216 Sk. 11	F. 243 Sk. 15
Humerus:							
Maximum Length	*	*	*	29.5 (R)	*	*	*
Maximum Head Diameter	*	*	*	*	*	*	*
Maximum Midshaft Daim.	*	*	2.82 (R)	1.96 (R)	*	*	*
Minimum Midshaft Diam.	*	*	1.51 (R)	1.32 (R)	*	*	*
Circumference, Midshaft	*	*	5.9 (R)	5.6 (R)	*	*	*
Epicondylar Breadth	*	*	5.49 (R)	5.42 (R)	*	*	*
Radius:							
Maximum Length	*	*	*	20.5	*	*	*
A-P Diamter, Midshaft	*	*	1.05 (R)	0.93	*	*	*
M-L Diameter, Midshaft	*	*	1.51 (R)	1.23	*	*	*
Ulna:							
Maximum Length	*	*	24.2 (R)	*	*	*	*
A-P Diameter, Midshaft	*	*	1.01 (R)	*	*	*	*
M-L Diameter, Midshaft	*	*	1.51 (R)	*	*	*	*
Minimum Circumference	*	*	3.1 (R)	*	*	*	*
Clavicle:							
Maximum Length	*	*	14.0 (R)	12.8 (R)	*	*	*
Circumference, Midshaft	*	*	3.1 (R)	2.8 (R)	*	*	*
Scapula:							
Glenoid Height	*	*	3.56 (R)	3.14 (R)	*	*	*
Glenoid Breadth	*	*	2.53 (R)	2.39(R)	*	*	*
Pelvis:							
Breadth	*	*	*	12.2	12.7	*	*
Acetabulum Max. Diameter	*	*	*	*	*	*	*
Femur:							
Maximum Length	*	*	*	*	*	*	*
A-P Diameter, Proximal	*	*	*	2.29 (R)	2.62	2.49	*
M-L Diameter, Proximal	*	*	*	2.96 (R)	3.11	3.46	*
A-P Diameter, Midshaft	2.83	2.36	*	2.32 (R)	2.97	2.47	*
M-L Diameter, Midshaft	*	1.92	*	2.16 (R)	2.59	2.62	*
A-P Diameter, Distal	*	*	*	2.19 (R)	*	*	*
M-L Diameter, Distal	*	*	*	3.35 (R)	*	*	*
Midshaft Circumference	*	*	*	7.0 (R)	8.7	7.9	*
Neck Diameter, (Vert.)	*	*	*	2.87 (R)	*	*	*
Neck Diameter, (Trans.)	*	*	*	2.25 (R)	*	*	*

APPENDIX F.
MORTUARY ATTRIBUTES
(Postcranial Measurements)

Feature	F. 19 Sk. 1	F. 185 Sk. 3	F. 195 Sk. 6	F. 195 Sk. 7	F. 198 Sk. 9	F. 216 Sk. 11	F. 243 Sk. 15
Tibia:							
Maximum Length	*	*	*	*	*	*	*
A-P Diameter, Proximal	*	*	*	3.36 (R)	*	*	*
M-L Diameter, Proximal	*	*	*	2.77 (R)	*	*	*
A-P Diam., Nutr. Foramen	*	*	*	2.82 (R)	*	*	*
M-L Diam., Nutr. Foramen	*	*	*	1.96 (R)	*	*	*
A-P Diameter, Midshaft	*	*	*	2.62 (R)	3.62	*	2.39 (R)
M-L Diameter, Midshaft	*	*	*	1.85 (R)	2.19	*	1.89 (R)
Midshaft Circumference	*	*	*	6.9 (R)	*	*	*
Patella:							
Height	*	*	*	3.51 (R)	*	*	*
Breadth	*	*	*	3.44 (R)	*	*	*
Thickness	*	*	*	1.79 (R)	*	*	*
Calcaneous:							
Length	*	*	*	6.50 (R)	*	*	*
Breadth of Body	*	*	*	1.93 (R)	*	*	*
Talus:							
Length	*	*	5.06	*	*	*	*
Breadth	*	*	4.05	*	*	*	*
Height	*	*	2.84	*	*	*	*

†Standard measurements presented in Bass (1987) and Buikstra and Ubelaker (1994); all measurements taken on left side unless otherwise indicated.

APPENDIX F.
MORTUARY ATTRIBUTES
(Age Estimation-Buikstra and Ubelaker)

	F. 192, Sk. 5			F. 195, Sk. 6			F. 216, Sk. 11			F. 241, Sk. 13			F. 243, Sk. 15			F. 250, Sk. 18			F. 253, Sk. 19		
MAXILLA	LENGTH	WIDTH	HEIGHT	LENGTH	WIDTH	HEIGHT	LENGTH	WIDTH	HEIGHT	LENGTH	WIDTH	HEIGHT	LENGTH	WIDTH	HEIGHT	LENGTH	WIDTH	HEIGHT	LENGTH	WIDTH	HEIGHT
RM3																					
RM2																					
RM1														1.34	0.57						
RP2													0.67	0.95	0.61						
RP1																					
RC																					
RI2																					
RI1										0.85		0.86									
LI1										0.83	0.75	0.86									
LI2										0.74	0.67	0.69									
LC										0.78	0.93	0.73	0.81		0.89						
LP1										0.75	0.94	0.65	0.70	0.97	0.74						
LP2										0.69	0.97	0.68	0.71	0.98	0.69						
LM1										1.12	1.20	0.74				1.07	1.07				
LM2							1.15	1.44	0.75	1.00	1.12	0.96	0.96	1.14	0.70						
LM3										0.86	1.07	0.58									
MANDIBLE																					
RM3										0.99		0.58									
RM2	1.25	1.07	0.70																		
RM1				1.08	1.01	0.45				1.05		0.51				1.28	1.07				
RP2				0.74	0.92	0.57						0.59	0.70	0.84	0.57						
RP1				0.69	0.85	0.59							0.63								
RC																					
RI2																					
RI1													1.11	1.01	0.67						
LI1																			0.58		
LI2																			0.61		
LC				0.71	0.71	0.79													0.67		
LP1				0.71	0.84	0.55				0.71	0.81	0.65	0.64	0.77	0.69						
LP2	0.82	0.88	0.74							0.80	0.90	0.61	0.68	0.84	0.60						
LM1	1.26	1.11	0.75				1.19	1.13	0.58	1.25	1.00	0.63				1.16	1.06		1.14	1.05	0.75
LM2	1.25	1.09	0.69							1.12			1.10	1.06	0.49						
LM3				1.12	0.91	0.38							1.08	1.09	0.69						

* Standard methods presented in Buikstra and Ubelaker 1994

APPENDIX F.
MORTUARY ATTRIBUTES
(Dental Measurements-Subadults)

	F. 195, Sk. 8			F. 250, Sk. 18			F. 253, Sk. 19		
MAXILLA	LENGTH	WIDTH	HEIGHT	LENGTH	WIDTH	HEIGHT	LENGTH	WIDTH	HEIGHT
rm2				0.91	1.00	0.55			
rm1									
rc				0.64	0.59	0.74			
ri2				0.53					
ri1				0.67	0.53	0.63			
li1				0.69	0.53	0.65			
li2									
lc									
lm1				0.68	0.98	0.46			
lm2				0.92	1.02	0.62			
MANDIBLE									
rm2				1.01	0.87	0.64			
rm1									
rc				0.57	0.50	0.71			
ri2									
ri1	0.39	0.36							
li1									
li2				0.48	0.44	0.68			
lc				0.59	0.54	0.69			
lm1				0.75	0.77	0.68			
lm2				0.99	0.86	0.79	1.04	0.94	0.59

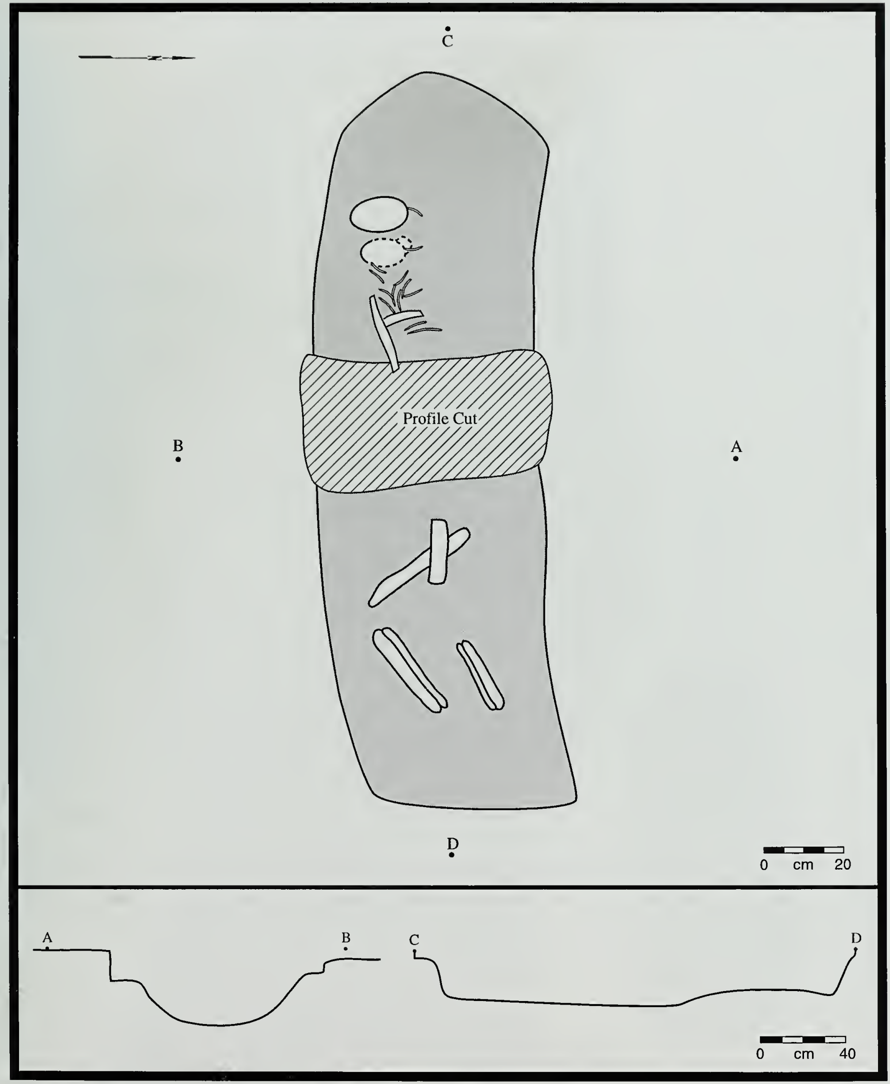
* Standard methods presented in Buikstra and Ubelaker 1994

APPENDIX F.
MORTUARY ATTRIBUTES
(Nonmetric Measurements)

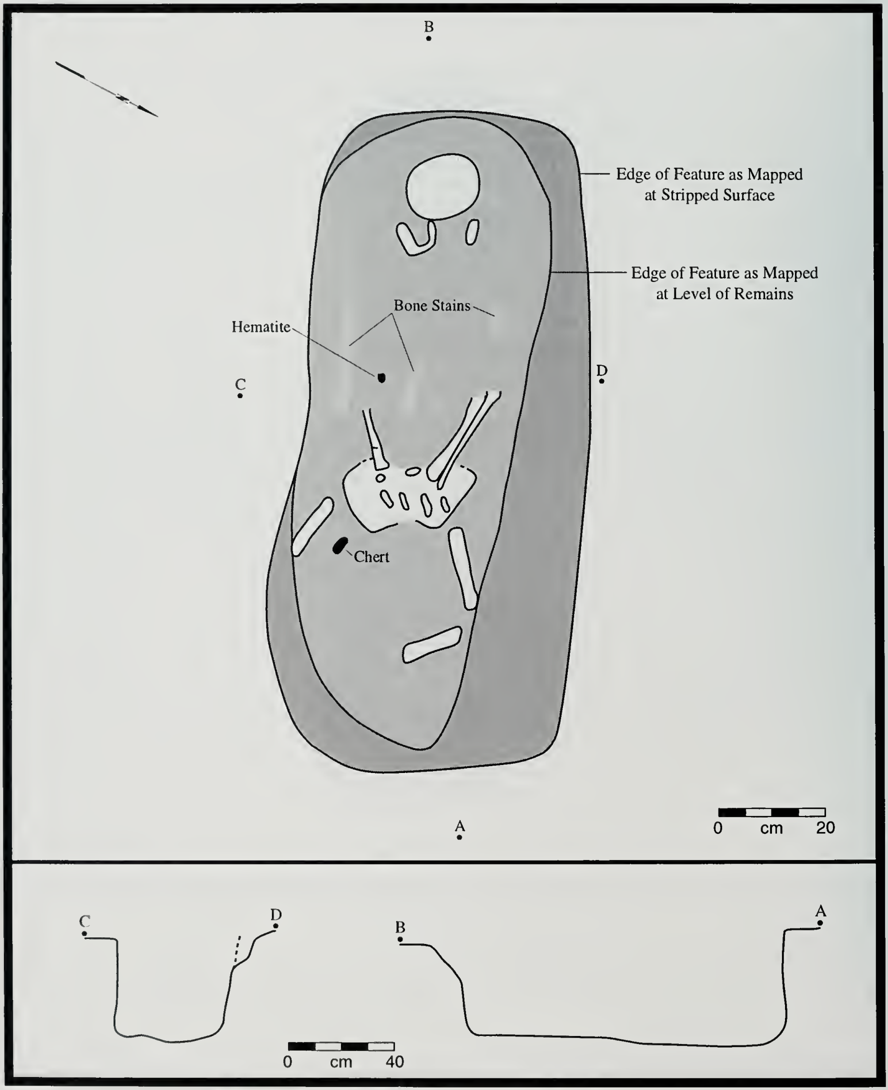
FEATURE	F. 192 Sk. 5	F. 195 Sk. 6	F. 195 Sk. 7	F. 241 Sk. 13	F. 250 Sk. 18	F. 252 Sk. 19
Presence (1), Absence (0), Undetermined (*):						
Inion Hook	*	*	0	*	*	*
Longus Capitus Depression	*	*	0	*	*	*
Guttered Lower Nasal Border	*	*	0	*	*	*
Nasal Overgrowth	*	*	0	*	*	*
Zygomatic Posterior Tubercle	*	*	1	*	*	*
Malar Tubercle		*	1	*	*	*
Inca Bone	*	*	0	*	*	*
Wormian Bones	*	*	*	*	*	*
Other Ossicles	*	*	*	*	*	*
Metopic Suture	*	*	0	*	*	*
Venous Markings	*	*	*	*	*	*
Supra-Orbital Notch	*	*	0	*	*	*
Supra-Orbital Foramen	*	*	1	*	*	*
Multiple Infra-Orbital Foramina	*	*	0	*	*	*
Parietal Foramina	*	*	*	*	*	*
Divided Hypoglossal Canal	*	*	*	*	*	*
Tympanic Dehiscence	*	*	0	*	*	*
Auditory Exostosis	*	*	*	*	*	*
Congenital Absence of M3	*	*	1	0	*	*
Shovelled Incisors	1	*	1	1	1	1
Incisor Rotation	*	*	0	*	*	*
Premolar Rotation	*	*	1	*	*	*
Enamel Extentions	*	1	1	*	*	*
Enamel Pearl	*	0	*	*	*	*
Buccal Pits	1	1	0	1	1	1
Carabelli's Cusp	*	0	0	*	*	*
Molar Crenulations	*	*	0	*	*	*
Septal Aperature	*	1	1	*	*	*
Qualitative Observations:						
Orbital Shape	*	*	round	*	*	*
Nasal Sill	*	*	shallow	*	*	*
Nasal Opening	*	*	all flared	*	*	*
Zygomatics	*	*	retreating	*	*	*
Prognathism	*	*	slight	*	*	*
Dental Arcade	*	*	elliptic	*	*	*
Chin	*	blunt	blunt	*	*	*
Chin Profile	*	prominent	prominent	*	*	*
Mandibular Border	*	straight	straight	*	*	*
Ascending Ramus	*	wide	wide	*	*	*
External Auditory Meatus	*	*	elliptic	*	*	*
Palatine Suture	*	*	straight	*	*	*
Zygomatic Suture	*	*	angled	*	*	*

†Presented in Gill and Rhine (1990)

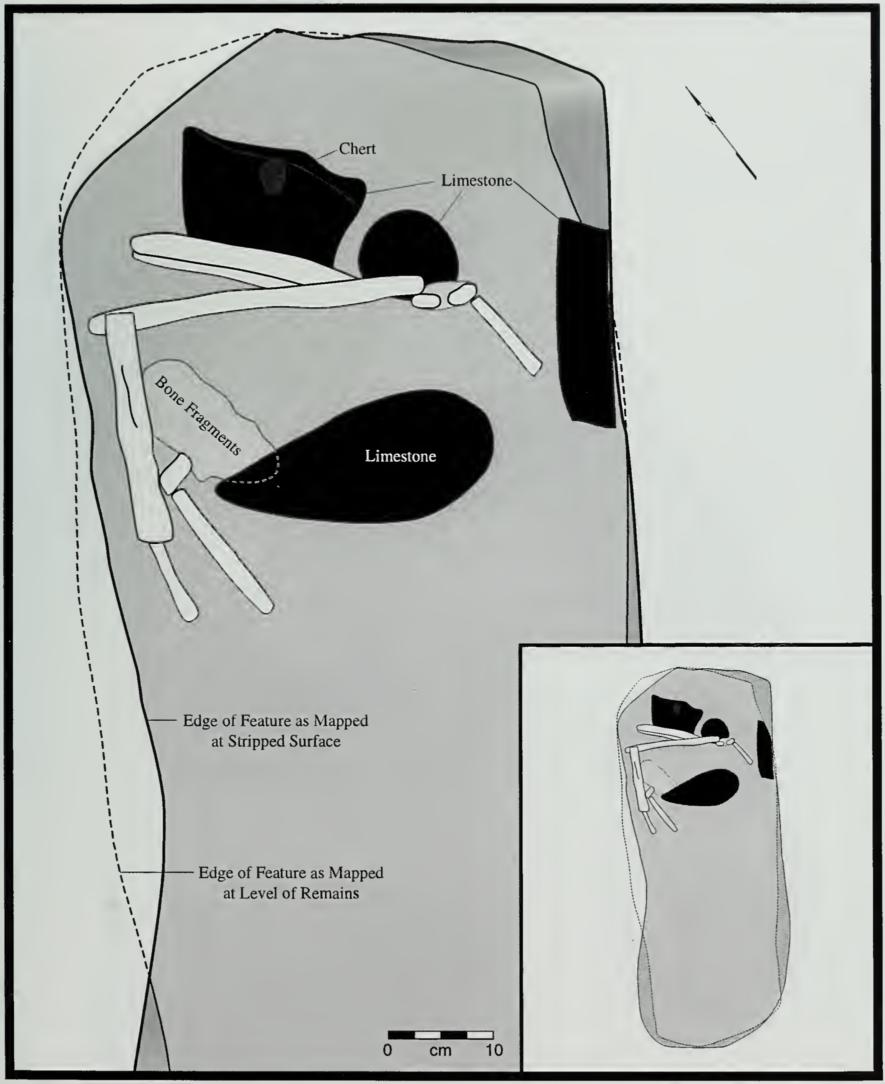
APPENDIX F.
MORTUARY ATTRIBUTES
FEATURE 19
PLAN AND PROFILE



APPENDIX F.
MORTUARY ATTRIBUTES
FEATURE 216
PLAN AND PROFILE



APPENDIX F.
MORTUARY ATTRIBUTES
FEATURE 198 PLAN



APPENDIX F.
MORTUARY ATTRIBUTES
FEATURE 195 PLAN