PENITENTIARY BRANCH

A Late Archaic Cumberland River Shell Midden in Middle Tennessee

Patricia A. Cridlebaugh

Edited by Aaron Deter-Wolf

Department of Environment & Conservation

Division of Archaeology
Report of Investigations No. 4
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with contributions by
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PREFACE TO THE SECOND EDITION

Aaron Deter-Wolf

Human occupation of the Cumberland River Valley in Tennessee extends back to the end of the Pleistocene, when it was initially settled by small, mobile groups of foragers drawn to the ample fresh water, lithic sources, and plant and animal resources of the region. Over the ensuing 12,000 years, Native Americans continued to orient their lives around the waterways of the Cumberland River Valley, which they relied on for food, transportation, raw materials, and fertile floodplain soils. This sustained occupation resulted in a rich archaeological record including more than 5,000 recorded prehistoric sites situated across 32 counties.

One of the many archaeological site types that formed along the Cumberland and its tributaries over the course of prehistory consisted of dense accumulations of freshwater shellfish, including both gastropod and bivalve species. These deposits are typically found on remnant natural levees or lower terraces overlooking river and stream confluences, although they have also been identified at caves and rockshelters (e.g., Peres et al. 2016). Sites which exhibit intensive mollusc deposition have been historically labeled as either "shell mounds" or "shell middens," although more recent discussions from the interior Southeast employ the functionally-neutral descriptor of "shell-bearing" (Claassen 2010; Peres and Deter-Wolf 2016). A review of site file information housed at the Tennessee Division of Archaeology reveals that 51 of approximately 233 recorded prehistoric shell-bearing site locations in Tennessee are situated within the Cumberland River Valley (Figure A). At least 31 of the Cumberland River Valley sites include shell deposits which formed during the Middle and Late Archaic periods (Peres and Deter-Wolf 2016).

Archaic Shell-Bearing Sites

Similarly dense concentrations of freshwater mollusks appear during the Archaic at sites along other interior waterways of the Southeast, including the Green River and its tributaries in Kentucky, the Tennessee River in Alabama and Tennessee, and the Duck River in Tennessee. Archaic shell-bearing sites in these areas have been intensively investigated by archaeological projects including work by antiquarian scholars (Moore 1915, 1916), pre-inundation survey and salvage through the Works Progress Administration and Tennessee Valley Authority (e.g., Crites 1987; Klippel and Morey 1986; Lewis and Kneberg 1947, 1959; Lewis and Lewis 1961; Webb 1938, 1939, 1974; Webb and DeJarnette 1942), the Shell Mound Archaeological Project along the Green River (e.g., Crothers 1999; Marquardt and Watson 1983, 2005; Moore 2011), and finally through more recent reanalysis and reconsideration of the accumulated data (e.g., Baerreis 2005; Bissett 2014; Claassen 1991, 1992, 1996, 2010; Sassaman 2010; Thompson 2010).

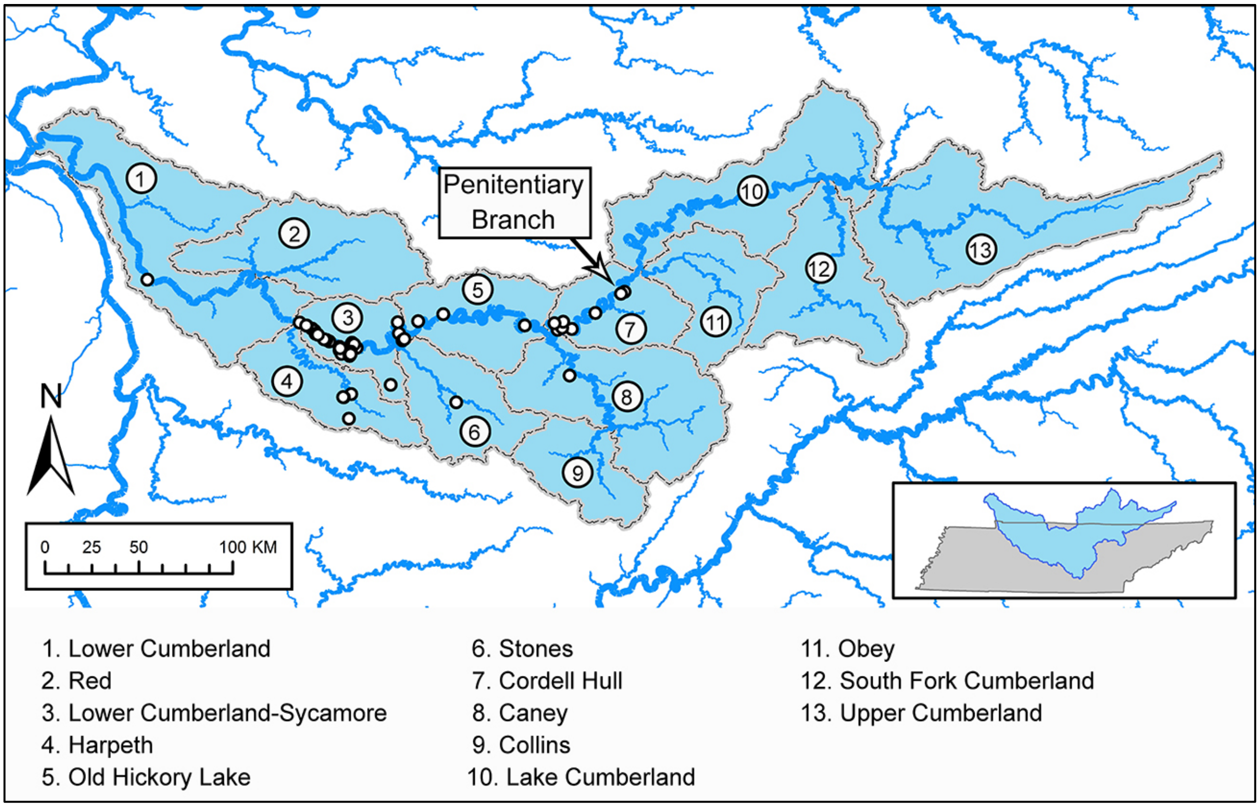

Figure A. The Cumberland River Valley, divided by subbasin and showing the location of Penitentiary Branch and prehistoric shell-bearing sites in Tennessee.

The terminology used to describe these sites —*shell middens* and *shell mounds*— reflects the two predominate theories as to their formation processes and function. In discussing *shell middens*, proponents focus on the accumulation of shell-bearing deposits as a result of seasonal occupation over hundreds or thousands of years (Hofman 1984; Jenkins 1974). According to this hypothesis, the selection of shell-bearing site locations reflects targeting of shellfish beds as sources of plentiful food during periods of drought and extreme environmental pressure during the Hypsithermal Interval, ca. 6500– 3000 BC (Brookes and Twaroski 2015). One of the seminal studies contributing to the shell midden hypothesis was the work by Lewis and Lewis (1961) at the Eva site on the Tennessee River in Benton County, Tennessee. Lewis and Lewis proposed that extended droughts during the Archaic caused terrestrial game populations to crash, while lower river levels simultaneously allowed site inhabitants greater access to nearby shellfish beds. Thus, while species such as deer dominated earlier and later midden contexts at Eva, Lewis and Lewis believed that low amounts of terrestrial fauna within the shell-bearing midden reflected a period of environmentally-determined reliance on molluscan species.

Conversely, the *shell mounds* model emphasizes the onset of sociopolitical complexity during the Archaic period. By this interpretation, Archaic populations deliberately harvested and re-deposited massive amounts of freshwater shell in order to construct above-ground monuments (e.g., Anderson 2004). The labor organization necessary for such an effort implies existence of a directed labor pool, hierarchical social organization, and architectural intent, all traits that until recently were not considered synonymous with Archiac forager societies. Further, it has been suggested that the presence of large numbers of burials within shell mounds on the Green River at sites such as Indian Knoll and Carlston Annis, and the perceived use of these locations for feasting events, constitute complex symbolic behavior intended to associate shell-bearing sites and their surrounding territories with particular groups or lineages (e.g., Claassen 1996, 2010).

Regardless of the *shell midden* or *shell mound* debate, discussions of Archaic shell-bearing sites in the interior Southeast have tended to focus on these locales as expressions of a pan-Southeastern cultural phase known as the "Shell Mound Archaic" (SMA), a term first employed by William Webb in reference to sites he excavated along the Green River in the 1930s and 1940s (Webb and DeJarnette 1942). While the SMA remains a useful reference point to discuss shell-bearing site formation, lumping of these various sites and regions within a single phase suggests a monolithic cultural expression that is not reflected in the archaeological data. As recently noted by Bissett (2014:6), there exist "appreciable differences in the age, scale, and composition of shell-bearing sites across the SMA's core regions."

Radiocarbon dates for Archaic shell-bearing sites in the interior Southeast span the period from approximately 6600 through 1000 cal BC (Bissett 2014; Claassen 2010; Peres and Deter-Wolf 2016). Specific site chronologies reveal that the beginning and duration of concentrated mollusc deposition vary both by river valley and by site. Additionally, while some shell-bearing sites have been determined to contain living surfaces, activity features, and/or extensive cemeteries, others do not. Theories regarding specific cultural and environmental forces which led to the formation of shell-bearing sites in the Southeast therefore remain the subject of ongoing debate (e.g., Anderson 2004, 2010; Claassen 1991, 1992, 1996, 2010; Marquardt 2010a, 2010b; Moore and Thompson 2012; Peacock 2002; Sassaman 2006). One recent re-interpretation of SMA sites along the Green River proposes that over centuries these habitation, resource, and cemetery locations became greater than the sum of their depositional history, transitioning into persistent places on the landscape (Moore and Thompson 2012). Meanwhile, Peres and Deter-Wolf (2013) have suggested that predominantly gastropod middens along the Cumberland River west of Nashville constitute possible evidence for mid-Holocene aquaculture or human management of gastropod beds. As compared to Green River SMA sites, Cumberland River sites such as 40DV7 may lack internal features or living surfaces, contain proportionally fewer graves, and contain a very light density of lithic tools or debitage.

Few formal archaeological studies have taken place at Archaic shell-bearing sites in the Cumberland River Valley prior to the past decade. The presence of prehistoric shell deposits along the Cumberland in Cheatham, Sumner, and Wilson Counties was noted in the 1940s and 1950s during pre-inundation survey of the Center Hill, Cheatham, and Old Hickory Reservoirs by the Smithsonian Institution River Basin Survey (Solecki 1954; Willey 1947). Unfortunately, those reports contain little useful information regarding the character, cultural affiliations, or in many instances even the specific locations of identified sites. Subsequent pre-inundation surveys of the Cordell Hull and J. Percy Priest Reservoirs by Dan Morse and colleagues from the University of Tennessee-Knoxville (Morse and Morse 1964; Morse and Polhemus 1963, 1964) investigated shell-bearing deposits at sites in Jackson and Smith Counties, including 40SM1, 40SM8, 40SM10, 40JK2, 40JK10, and culminated with Morse's dissertation on Robinson Shell Mound (40SM4) (Morse 1967).

While there have been numerous archaeological surveys and site-specific excavation projects throughout the Cumberland River Valley, few of those have specifically addressed Archaic shell-bearing sites beyond a cursory level. The Tennessee Division of Archaeology (TDOA) conducted informal examinations of nine Archaic shell-bearing sites in Davidson and Cheatham County in 1976 and 1977 as part of a statewide prehistoric site survey effort (Jolley 1978). Those efforts produced few written site descriptions or field notes, recovered little in the way of diagnostic artifacts, and did not include any formal analysis of faunal remains. More recently, Section 106 compliance work at sites 40CH50 and 40CH73 (Dicks 1999), 40CH171 (Barker 2010a, 2010b), 40CH191 (Barker 2002), and 40DV160 (Bentz 2012), burial removal at 40DV551 (Allen 2006), and salvage efforts at 40RD299 (Peres et al. 2016), have all contributed considerably more data regarding shell-bearing site distribution and associated artifact classes.

Since 2010 concerted efforts combining site survey and monitoring, salvage, targeted excavations, and examinations of radiocarbon chronologies at sites in Davidson and Cheatham Counties (Anderson et al. 2011; Deter-Wolf and Peres 2012; Deter-Wolf et al. 2010, 2011; Miller et al. 2012; Peres et al. 2011, 2012; Peres and Deter-Wolf 2013, 2014) have revealed significant new information about the SMA within the Cumberland River Valley. In a preliminary effort at synthesizing the associated chronological data, Peres and Deter-Wolf (2016) assembled 44 radiocarbon dates from a total of 11 shell-bearing Archaic sites on the Cumberland and Harpeth Rivers in the Middle Cumberland River Valley (that portion of the Cumberland and its tributaries in Tennessee between the Obey and Harpeth river confluences). That data reveals the formation and occupation of Archaic shell-bearing sites in the region took place between approximately 6000 and 1000 cal BC. The specific onset and duration of Archaic shellfish exploitation varies by site, with the earliest deposits occurring at the Anderson site on the Harpeth River (40WM9) (Dowd 1989). Along the Cumberland between its confluences with the Stones and Harpeth Rivers, Archaic shell deposition tapers off and in most cases ends by approximately 3400 cal BC. To the east of the Caney Fork confluence, shellfish deposition does not appear to commence until ca. 2000 cal BC, after which it continues for approximately 1,000 years (Peres and Deter-Wolf 2016:Table 3).

Penitentiary Branch: A Fresh Look

During the fall and winter of 1976, a TDOA field crew under the direction of Patricia Cridlebaugh conducted salvage excavations at site 40JK25, an Archaic shell-bearing deposit overlooking the confluence of the Cumberland River and Penitentiary Branch in Jackson County, Tennessee (Figure B). An initial artifact analysis was conducted over three months following the excavation, after which time Cridlebaugh went on to complete her MA degree at the University of Tennessee, Knoxville (Cridlebaugh 1977). Additional Federal Highway Administration funds were subsequently authorized to re-contract with Cridlebaugh from September 1980 through

September 1981 in order to complete the analysis. Due to the volume of artifacts recovered from the site, along with bureaucratic and financial issues, the laboratory effort was not completed as scheduled. In November of 1981 the Tennessee Department of Conservation authorized further monies to fund a final year of analysis, including both specialized zooarchaeological and ethnobotanical studies.

Figure B. Crew member Margaret McKean excavates the shell-bearing midden at Penitentiary Branch, September, 1976.

The camera-ready copy of the Penitentiary Branch report was delivered to the TDOA in March 1983, along with a 122-page appendix detailing the provenience of selected lithic and faunal materials. The report was published in 1986 as Volume 4 of the Tennessee Department of Conservation, Division of Archaeology's Report of Investigations series. The appendix was not included in that printing.

Although the Penitentiary Branch report appears frequently as a citation in the regional archaeological literature, actual copies of the work are difficult to locate due to a limited print run. Even with a copy in hand, meaningful interpretation of the original report is severely hampered by a combination of issues related to both printing and analysis. The original edition was produced in low-quality black and white, resulting in many photographs and elements of the site map being rendered virtually illegible. The omission of the appendix in the original printing made it impossible to determine the specific provenience of lithic tools or zooarchaeological remains.

From an analytical perspective, the discussion of lithic tool types relies on morphological traits to over-segregate the assemblage into numerous, cumbersome sub-categories that are for the most part likely unrelated to artifact use or function. Faunal materials are only recorded by species to vertical site level, and absent the original appendix there is no accounting of zooarchaeological element data. The full range of feature content, and the relationship of features to one another, is at best opaque. Despite possibly comprising a majority of the shell-bearing deposits in certain site levels and features, gastropod remains from Penitentiary Branch were never analyzed or tabulated. Finally, the treatment of skeletal elements and pathologies was unclear in several instances.

These critiques aside, the Penitentiary Branch report remains significant to the regional literature for its role as only the second effort to interpret an Archaic shell-bearing site in the Cumberland River Valley. With this in mind, a new edition of the Penitentiary Branch site report was produced from 2015–2017 as part of ongoing initiatives by the TDOA under State Archaeologist Mike Moore to facilitate online access to the “gray literature” of older TDOA publications and create a permanent digital archive of site data. The process began in 2015 with the complete transcription of the original report by TDOA Administrative Secretary Glendon Swann. The transcribed file was subsequently corrected and formatted to best accommodate digital text flow.

Editing of the second edition was conducted with intent towards providing clarity without altering the conclusions of the original work. Biological species names were corrected and/or updated, and general references to *mussel* were replaced with the more appropriate *bivalve*. Typographic errors were corrected in both text and tables, sentence structure was imposed onto paragraph-long analyses previously broken up by semi-colons, and both figure and table captions were clarified or updated as necessary. All data tables were relocated to appendices, and calculated values and totals were cross-checked and corrected as necessary. The original appendix prepared by Cridlebaugh is included in the edited report as Appendix G. Shannon Hodge of Middle Tennessee State University provided an essential review of the human skeletal analysis, which for the second edition has been separated from the general feature discussion as Chapter VI. Information on burial orientation and position was added from the original burial data sheets. Finally, footnotes were added throughout to provide additional clarity or highlight contemporary citations.

In 1998 the TDOA offices (then on Edmonson Pike in Nashville) suffered from a flash flood which impacted many archival records. While some documents were rescued during the flood or recovered in the following weeks, others were damaged beyond repair. Unfortunately, the original camera-ready illustrations, photo enlargements, black and white negatives, and some field data used to produce the original Penitentiary Branch report were not salvageable. Unit and feature forms completed in pencil, correspondences, artifact analysis sheets, and color 35mm slide film survived in better, albeit somewhat wrinkled condition.

Illustrations for the electronic edition were generated wherever possible by digitizing original photographic negatives or 35mm slides and hand-drafted images. Illustrations for which the originals did not survive the 1998 flood were updated using suitable replacements, and in some cases omitted if deemed unnecessary. Maps and drawings were recreated as native digital files, depending on the quality of the original archival materials. In some instances report figures were replaced with new versions in order to capitalize on the full-color capability of the electronic report format, or to correct typos and errors in the originals. Feature position and orientation on the site plan map (Figures 6 and 7) was verified using original field data wherever possible, and corrected if found to be in error. Finally, the digital report file was saved as a PDF file and optimized for online viewing, including the creation of tags for in-document navigation.

The 2017 edition of the Penitentiary Branch report is hosted on the TDOA web page along with other electronic report files for free download:

http://www.tennessee.gov/environment/article/arch-archaeology-publications

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I. INTRODUCTION

Proposed reconstruction of State Route 53 in northern Jackson County, Tennessee prompted a preliminary archaeological survey of the planned right-of-way in 1974. This survey, conducted by the Tennessee Division of Archaeology (TDOA), located three archaeological sites which would be adversely impacted by the highway construction. The Tennessee Department of Transportation (TDOT) mitigated impacts to two of these sites by altering construction plans; however, it was determined that the third, 40JK25, also known as the Penitentiary Branch site, would be destroyed by the proposed highway and bridge construction.

Site 40JK25 is located in northern Jackson County, Tennessee, on the left (descending) bank of the Cumberland River at its confluence with Penitentiary Branch (Figure 1). In March of 1976 the TDOA proposed to excavate the site which is situated on United State Army Corps of Engineers easement property, in order to mitigate its destruction. The proposal submitted to TDOT (Tennessee Division of Archaeology 1976) estimated the horizontal area of the site to be approximately 0.1329 ha, with a single homogeneous midden extending 20 to 40 cm below surface. The TDOA proposed 100 percent excavation of the site be conducted over an eight week period with a crew of eight laborers, a field assistant, and a field director. Laboratory analysis would not exceed 12 weeks. The proposed budget of $19,050.00 covered salaries, vehicle mileage, field camp rental and utilities, and miscellaneous equipment and supplies. It was also proposed that a final publishable report of investigations would be submitted within one year of the starting excavation date. Since it was anticipated that an in-house Division archaeologist would conduct the investigations, no budget for the laboratory analyses and report preparation was included in the submitted proposal and budget.

In June of 1976, an agreement was signed between the Tennessee Department of Conservation and the TDOT for the excavation of 40JK25 on or before November 15, 1976 with a budget of $19,048.54. As a temporary (five month) employee of the TDOA, I began excavations at the Penitentiary Branch site on September 21, 1976 with a crew of eight laborers and a field assistant. Over the initial eight week field season it quickly became obvious that due to time and labor contractual constraints and the actual size of the site, excavations would be salvage rather than total.

The vertical extent and complexity of the site had been grossly underestimated. Consequently, the site was only partially sampled and no additional funding was sought by the TDOA. Subsequent to the 1976 excavations, the site was completely destroyed by highway construction. The two agencies involved in this project are to be commended for scheduling archaeological excavations at Penitentiary Branch well ahead of the highway construction. It is unfortunate, however, that archaeological investigations could not be scheduled during a warmer season since the extreme cold during October and November created conditions which hampered field recovery.

From November 19, 1976 until February 1, 1977, Field Assistant Marion Drescher and I processed archaeological material collected during the excavations. This included the cleaning, cataloging, and preliminary classification of lithic, faunal, and historic remains as well as water flotation of archaeobotanical samples.

In November 1980 TDOT transferred funds for the laboratory analysis and preparation of a camera-ready report to the TDOA. It was at this time that I again became involved with the project under the terms of a personal services contract. The $9,405.00 budget included my salary (for report preparation and all analyses except faunal and human skeletal material) and funding for a zooarchaeological consultant, radiocarbon determinations, computer analyses, photography, professional typing, and miscellaneous supplies.

Figure 1. The Penitentiary Branch site at the confluence of the Cumberland River and Penitentiary Branch, view to the northeast.

II. ENVIRONMENT OF THE PENITENTIARY BRANCH LOCALITY

The Penitentiary Branch site, bisected by State Route 53, was located approximately 11 km northeast of Gainesboro in north central Jackson County, Tennessee. The site was situated at the confluence of Penitentiary Branch and the Cumberland River at River Mile 365 on the floodplain of the left (descending) bank (Figure 2), on the Burristown 7.5–minute Quadrangle within the Upper Cumberland River drainage.[1]

Environmental Setting

Geology

The Penitentiary Branch site was situated within the northeastern perimeter of the Outer Nashville Basin of the Interior Low Plateau physiographic province of Tennessee (Fenneman1938), immediately adjacent to the western escarpment of the Eastern Highland Rim (see Figure 2). The bedrock geology in the immediate vicinity of the site consists of a finger of folded and faulted units of Ordovician limestone (Bassler 1932; Hardeman et al. 1966) comprised of nodular, shaly, and thin bedded fine- to coarse-grained limestone (Hardeman et al. 1966). These deposits are surrounded by Devonian Chattanooga Shale, a black carbonaceous shale, and Mississippian Fort Payne Formation calcareous and dolomitic silicastone comprised of bedded chert, cherty limestone, shale, and scattered crinoidal limestone lenses (Hardeman et al. 1966). Two small deposits of dolomitic and cherty St. Louis and Warshaw Limestone outcrop approximately 4.5 km southeast of the site area. Quaternary alluvial sands, silts, clays, and gravels characterize the narrow Cumberland River floodplain.

The Cumberland River forms a series of meanders and oxbows where the river channel has incised against steep bluffs. The south side of the river in the site vicinity is characterized by steep bluffs which abruptly slope into a narrow floodplain. The narrow T0, T1 and dissected bluffs and hills are cut by Penitentiary Branch. This topographic pattern is repeated throughout the area due to the interface of the western escarpment of the Eastern Highland Rim with the Nashville Basin. Moreover, the regional topography is characterized by steeply dissected hills consisting of spur and hill outliers from the Highland Rim, which extend west into the Basin

[1] The United States Geologic Survey divides the Cumberland River watershed into Upper and Lower segments at its confluence with the Caney Fork in Smith County. However, Penitentiary Branch and 31 other Archaic shell-bearing sites located downstream have recently been identified as falling within the SMA tradition of the Middle Cumberland River Valley (Peres and Deter-Wolf 2016). That geographic culture area is oriented around the Cumberland River as it flows through Tennessee's Central Basin, from the confluence with the Obey River in Clay County downstream to the mouth of the Harpeth River in Cheatham County.

interior (Bassler 1932:16). Elevations within the immediate vicinity of the site area rise from 152.4 to 292.9 m (500 to 962 ft) above mean sea level (see Figure 2).

Soils

No soil survey has been compiled for Jackson County; however, a general soil map (Edwards et al. 1974) for the Nashville Basin shows floodplain and lower terrace soil associations in the study area are the Armour-Lynnville-Arrington series. This association is comprised of fine-silty, mixed, and thermic Hapludolls and Haplaudalfs which occur on level terrain to slopes of no greater than 12 percent. These soils, which typically have high available water capacity and P, may be productive, valuable crop land.

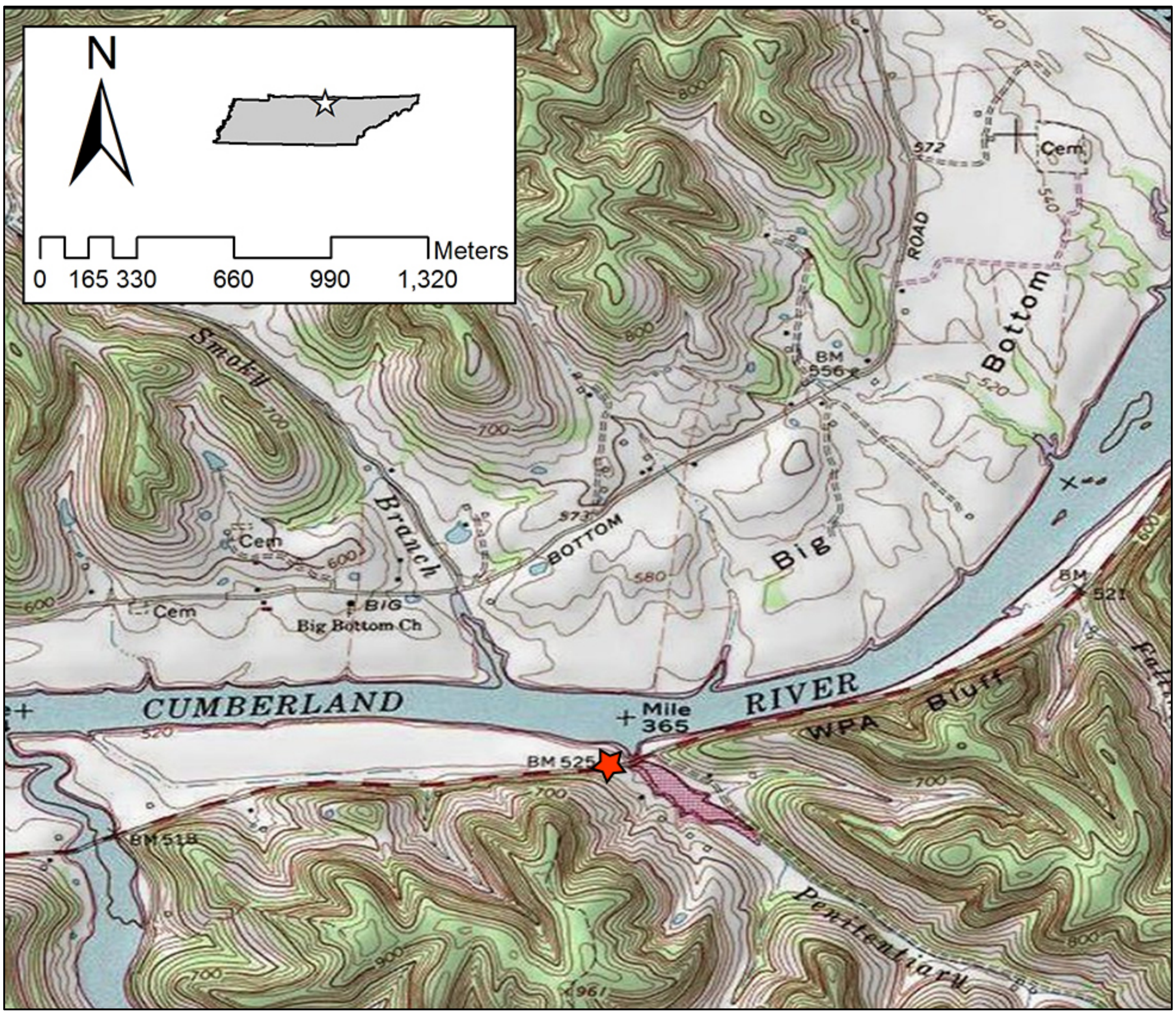

Figure 2. Location and contour map of the Penitentiary Branch site (40JK25), Jackson County, Tennessee.

The uplands south of the project area consist of the Dellrose-Bodine-Mimosa association (Edwards et al. 1974:11). These are fine-loamy, mixed, thermic; loamy-skeletal, siliceous, thermic; and fine, mixed, and thermic (Edwards et al. 1974:25–26) Hapludults, Paleudults, and Hapludalfs. Dellrose soils, a product of colluviums, occupy slopes with gradients ranging from 15 to 45 percent (Edwards et al. 1974:17). Bodine soils occur on narrow crests with slopes of 4 to 12 percent and steep upper slopes (12 to 40 percent gradients) of high ridges (Edwards et al. 1974:17) Although this loamy-skeletal and siliceous soil is permeable and deep to bedrock, the concentration of chert and low P indicate a poor soil unsuited for cultivation. The third soil, Mimosa, overlies limestone bedrock on slopes of 4 to 30 percent (Edwards et al. 1974:17). This fine, mixed, and thermic soil is characterized by a plastic subsoil and reaches depths of only 1.0 to 1.3 m; moreover, numerous limestone outcrops render this soil unsuitable for cultivation. This association, typically dissected by gullies 0.61 to 1.2 m deep, and shallow, cherty, and poor soils on steep slopes with limestone outcrops, is unsuitable for cultivation or residential sites.

Recent Vegetation

The topography and soil associations of the floodplain and lower terraces at the Penitentiary Branch site provide the most suitable areas for settlement and land use. However, the floodplain soil associations as well as the uplands and dissected hills with the Dellrose-Bodine-Mimosa associations and the humid mesothermal climate (Thornthwaite 1931) supported a vast array of plant taxa.

Using modern analogues and historical documents, it can be assumed that at the time of EuroAmerican settlement the deciduous hardwood forest consisted of taxa such as oak, maple, hickory, basswood, and beech. Arboreal taxa typically associated with Armour and Dellrose soils of the Nashville Basin include white oak (*Quercus alba*), red oak (*Quercus falcata*, Q.*rubra*), black oak (*Q. velutina)*, shagbark hickory (*Carya ovata*), red maple (*Acer rubrum*), sugar maple (A. saccharum), tulip poplar (*Liriodendron tulipifera*), basswood (*Tilia heterophylla*), American chestnut (*Castanea dentata*), American beech (*Fagus grandifolia*), hackberry (*Celtis occidentalis*), black walnut (*Juglans nigra*), American elm (*Ulmus* americana), and dogwood (Cornus florida) (Edwards et al. 1974:9). The rather plastic, shallow Mimosa soils support less luxuriant stands of many of these species; black locust (*Robinia pseudoacacia)* and redbud (*Cercis canadensis*) are more common on Mimosa soils. Several oak species such as postoak (*Q. stellata*) and blackjack oak (*Q. marilandica*) grow on the Bodine soils of steep upper slopes.

Taxa most suited to bottomland Arrington and Lynnville soils are oaks, hickories, elm, and beech as well as less productive green ash (*Fraxinus pennsylvanica*), river birch (*Betula nigra*), cherry (*Prunus sp*.), tupelo gum (*Nyssa aquatic*), sweet gum (*liquidambar styraciflua*), and sycamore (*Platanus occidentalis*) (Edwards et al. 1974:9). Disturbance indicators such as pine (*Pinus spp*.) would have dotted the lower terrace and upland landscape.

Braun (1950), mapping the recent forest, placed the Mixed Mesophytic/Western Mesophytic forest transition at the interface of the eastern Highland Rim escarpment with the Nashville Basin. Shelford (1963:35) encompasses this concept of a Mixed Mesophytic/Western Mesophytic forest in the recent tulip-deer-oak faciation for this region. Most dominant tulip-oak forest (mixed mesic) climax species include tulip poplar, white and red oaks, beech, basswood, sugar maple, American chestnut, and yellow buckeye (*Aesculus octandra*). Despite Braun's transition classification and the physiographic location of Penitentiary Branch, the site was not within an ecotone (cf. King and Graham 1981); moreover, and form of transitional gradient is doubtful.

Modern Climate

The mean annual temperature within the region is 14 degrees C; mean annual precipitation is 132 cm. Average date of the first freeze is October 25 and the last freeze is April 10 (Springer and Elder 1980:6–7).

III. RESEARCH STRATEGY AND EXCAVATION PROCEDURES

The Penitentiary Branch site was situated within the Cordell Hull Reservoir, where it was inundated by floodwaters approximately once every ten years. Although the reservoir impacted land in Smith, Jackson, and Clay Counties, Tennessee, a 1963 archaeological survey and testing program conducted by the University of Tennessee (Morse 1963a; Polhemus 1963) apparently did not extend upstream beyond Cumberland River Mile 348. Twelve sites in Smith County were identified and four were tested, while of the 14 Jackson County sites, one was tested. Eight of the Jackson County sites and nine of the Smith County sites were assigned Early to Late Archaic period cultural affiliations.

Testing results (Polhemus 1963:84–154) of the Cumberland River sites indicated most to be multicomponent. The West site (40SM1) was comprised of Paleoindian, Early Archaic, and Late Archaic period diagnostic artifacts. The multicomponent site 40SM8 yielded Early Archaic and Early Woodland period projectile points and ceramics. Apparently 40SM13, which produced diagnostic Early Archaic artifacts, was primarily a Late Archaic period occupation with Gary and Motley type projectiles. Artifacts derived from the Chambers site (40SM15) were poor diagnostic indicators but a Late Archaic period occupation was inferred (Polhemus 1963). Finally, the Sanders site (40JK10) yielded projectile points diagnostic of Early and Middle Archaic occupation. The most extensive occupation at Sanders was probably during the Late Archaic period. Artifacts recovered during the excavations included Gary, Cotaco Creek, and Motley type projectile points, knives, scrapers, limestone digging implements, ground stone axe fragments, and bone awls.

The primary excavation conducted in conjunction with the Cordell Hull Reservoir was at the Robinson Shell Mound (40SM4) (Morse 1963a:3–83; Morse 1967). This Late Archaic period site was located along the Cumberland River at River Mile 319.3 on an erosional remnant of a bluff near the river bottomland; nearby shoals and rapids (Morse 1967:8) would have provided optimal areas for the exploitation of riverine food resources. Over 6,000 mussel shells (taxa unidentified) were collected from the midden which reached a depth of no greater than 65 cm over a horizontal area of approximately 0.2024 ha.

Radiocarbon dates from the Robinson site span the period of approximately 1920–3 cal BC (Morse 1976:143).[2] The archaeological evidence, comprised of lithic and faunal remains, features, postholes, and burials, as well as Morse's (1967:247–250, 296) ecological deer yarding hypothesis resulted in interpretation of the Robinson site as a Late Archaic semi-permanent winter village.

[2] For recalibrated radiocarbon ages from Robinson using IntCal13, see Peres and Deter-Wolf (2016).

Morse (1967:143) proposes that the radiocarbon dates from Robinson cluster into three possible groups, given as 1265 BC, 973 BC, and 555 BC, and that these clusters represent separate occupations, each of which terminated after 40 to 50 winters (Morse 1967:298). Subsistence was based primarily on white-tailed deer and shellfish, with mussels acting as a supplemental resource when deer were not adequately available. Activities at the site included lithic and bone implement manufacture, hunting, fishing, gathering, and (possibly) trading. The 62 burials at Robinson suggest probable ceremonial activities surrounding those inhumations.

The archaeological survey, testing, and excavation efforts discussed above were the only extensive investigations conducted in the Upper Cumberland drainage of Tennessee prior to the identification of and decision to mitigate the impending loss of 40JS25. As relatively few archaeological investigations involving any cultural period have been conducted in this region, and with the subsistence-settlement questions raised by the Robinson site excavations, it was anticipated that work at 40JK25 would provide significant data on Late Archaic period subsistence and settlement patterns for the Cumberland River Valley and Middle Tennessee.

Research Goals

While archaeological surveys indicate prehistoric occupation of the Upper Cumberland River Valley beginning at least by 10,000 cal BC, the extent and patterns of prehistoric settlement are unknown. The 1963 and 1974 Smith-Jackson County surveys were biased riverine studies and little is known of upland or inter-riverine settlement patterns. Since few archaeological investigations have been conducted in the Upper Cumberland, the encompassing research goal was to obtain as much cultural data as possible from the Penitentiary Branch site excavations. More specific aims were to determine the cultural affiliation of the site, to derive subsistence and settlement data from all components, to define exploitation strategies, and to determine the relationship of the Penitentiary Branch site to Robinson Shell Mound. Accomplishment of these goals would require the collection of quantities of radiocarbon samples, the recovery of diagnostic lithic and bone artifacts in context, the recovery of extensive faunal material, the collection of numerous archaeobotanical samples for paleobotanical analysis, and the collection of subsurface disturbance data.

Site Description

The Penitentiary Branch site was situated on a narrow T0-terrace and the eroded colluvium of a 292.9 m-high bluff which rises immediately adjacent to the western edge of the occupation surface. The colluvial deposits, which formed a slight mound on a portion of the T0, probably overlay the Pleistocene floodplain and were a product of early Holocene erosion. The site, situated on this colluvial deposition, ranged from approximately 159.7–163.1 m above sea level. Prior to inundation a rocky shoal was presumably situated immediately to the northeast of the site at the confluence of Penitentiary Branch and the Cumberland River. The shell midden deposit consisted of a roughly circular 0.1764 ha accumulation with varying depths of plowzone underlain by layers of stratified shell-bearing deposits which extended from 5–145 cm in depth.

Excavation and Recovery Procedures

Deep backhoe testing was initiated to determine the horizontal perimeters of the Penitentiary Branch site and the vertical extent of the depositional material. Profiles cut by the original construction of State Route 53 through the site area were cleaned and examined for assessment of the internal midden stratigraphy. A Chicago type grid system (Cole and Deuel 1937:25), tied into geological survey BM 525 ft or 160 m (grid 100R200), was employed to establish 3x3 m excavation units. Forty-three units were fully excavated and six partially test-excavated (Figure 3), and named according to their southeast grid stakes.

Due to intermittent flooding of the lower elevations of the site, the upper deposition of units R194 through R203 was comprised of sterile alluvium. This material, mechanically removed down to the underlying zone of mixed alluvial and midden deposits, was discarded. The remainder of the site, previously utilized as a garden, was in pasture. The plowzone of units R218 through R233 was intensively mixed with the midden material; consequently, the ground cover was skim shoveled, examined for cultural remains, and discarded. Units were then skim shoveled in stratigraphic or in arbitrary 10-cm cuts. Despite the stratigraphic evidence provided by profiles in units 127R227, 136R227, 133R230, 136R230, and 139R230, the nature of the depositional layers made it difficult to detect the termination of one zone and the beginning of another during excavation. These units were comprised of numerous layers of dense concentrations of mussel shell and gastropods mixed with an unchanging soil matrix.

The concentration of dense mussel shell and fire-cracked limestone throughout the midden created additional recovery problems. A backhoe trench was excavated near the edge of the T0 to function as a settling basin for waterscreened sediments. A three-inch centrifugal pump provided water from the Cumberland River for the purpose of waterscreening all midden through graduated 6-mm and 12-mm mesh screens placed in the narrow end of each of three sluice box-design troughs. The accumulation of bivalves, gastropods, limestone, chert, and faunal material created a barrier and obstructed the screens. In addition, rootlets entwined in the mesh further prevented the evacuation of sediments and water. These factors resulted in an investment of at least 45 minutes to screen and pick each wheelbarrow load of midden. Alterations in the system such as use of 24-mm mesh did not appreciably alleviate the problem. Consequently, time and labor limitations resulted in the decision to randomly select one-half of the excavated levels for waterscreening through 12-mm and 24-mm mesh; the remaining levels were carefully shovel sorted. All subsurface disturbance fill not reserved for archaeobotanical samples was waterscreened through 6-mm and 12-mm mesh.

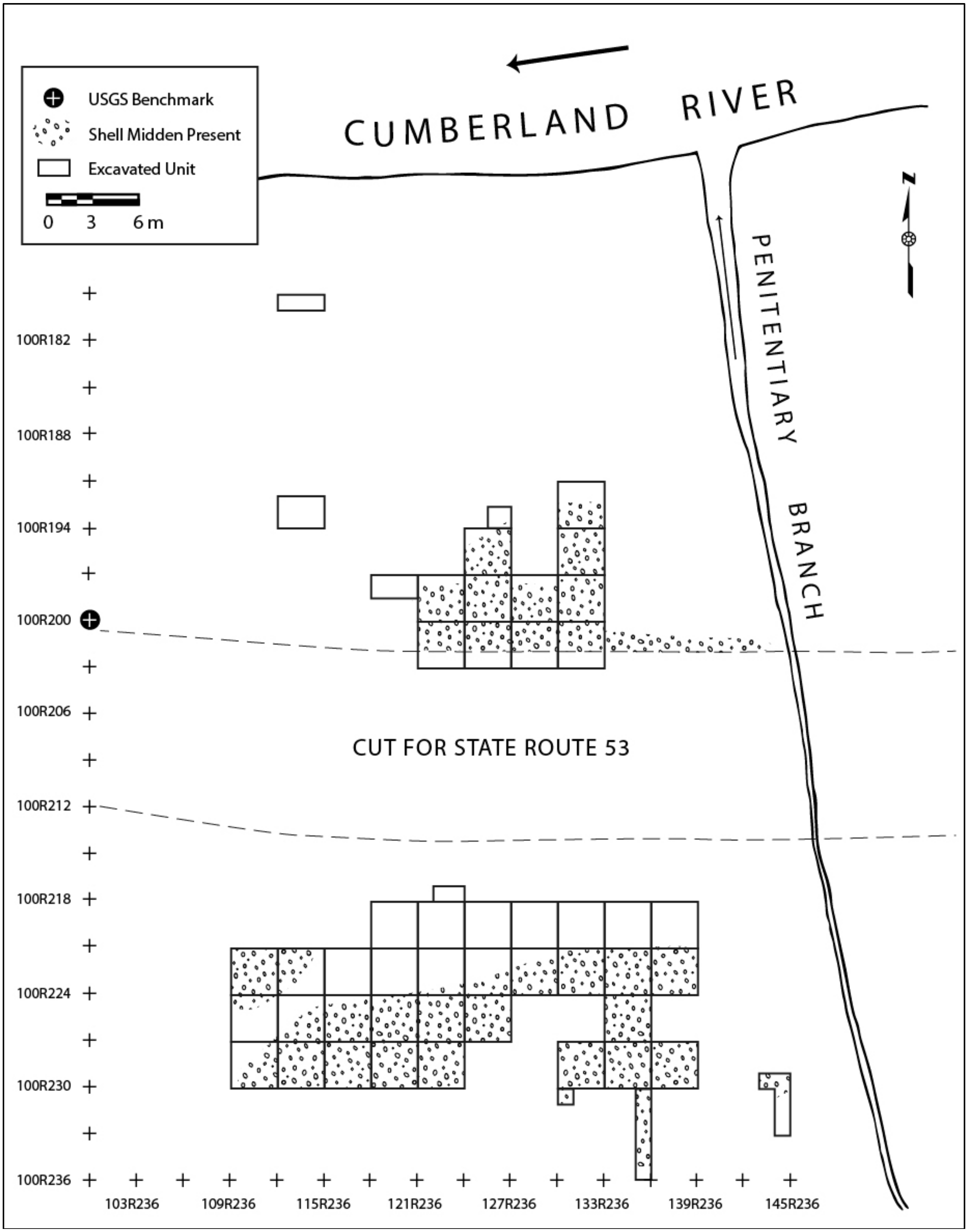

Figure 3. Plan view of excavation units at the Penitentiary Branch site.

IV. STRATIGRAPHY

The processes of shell midden formation are traditionally difficult to interpret (Marquardt and Watson 1976). Interpretation of the Penitentiary Branch site deposition and stratigraphy first requires an understanding of the natural topography of the site. As indicated in Chapter III, the midden accumulation was situated on a slight mound of colluvium derived from a bluff adjacent to the west and southwest of the Late Archaic period deposits. In the southern portion of the site, deposits between the bluff base and the channel of Penitentiary Branch which formed part of this landform had been dissected by an erosional gully. This gully had apparently been intentionally filled with shell and other midden debris during the prehistoric occupation of the site, and was comprised of at least 11 strata (Figures 4 and 5).

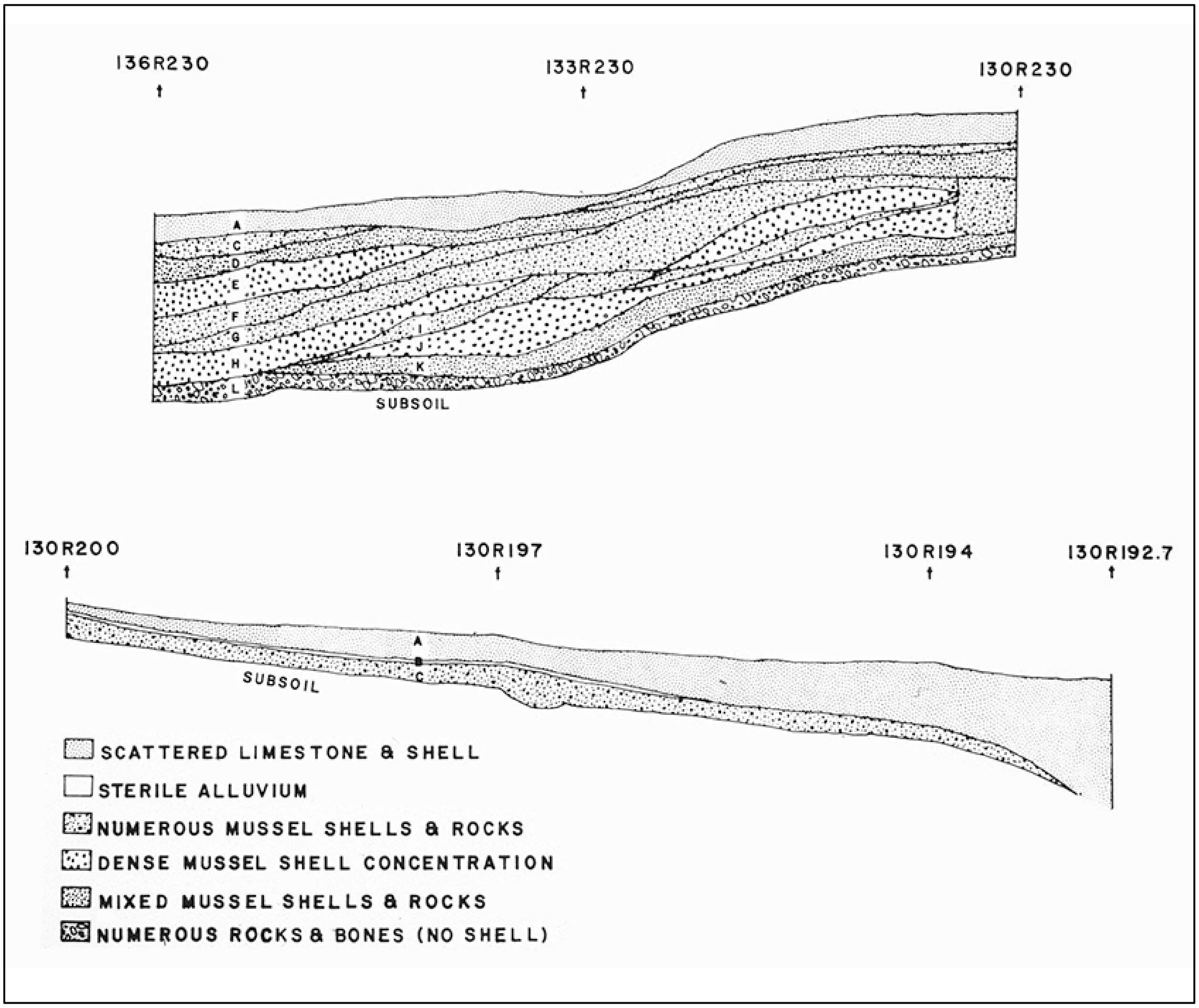

Figure 4. Stratigraphic profiles of midden accumulation.

Figure 5. View of stratigraphic layers, east profile, 136R230.

Along with the plowzone, levels identified in the erosional gully were designated Strata A through L, and are described below. These levels were not continuous over the Penitentiary Branch site (see Figure 4). With the exception of Strata D–L (Levels 3–11) in the gully area, however, I believe those zones forming Strata A and C were primarily contiguous.

- Stratum A: Level 1, plowzone: Units R194 to R203, dark grayish brown (10YR4/2, moist) fine sandy loam with scattered fire-cracked limestone and mussel bivalves (1 percent); units R215 to R236, very dark brown (10YR2/2, moist) fine clayey silt loam with fire-cracked limestone and scattered gastropod and bivalve (5+ percent) fragments.

- Stratum B: Level 2: Units R194 to R218, 3–15-cm band of brown (10YR5/3, moist) silty sand.

- Stratum C: Levels 3 and 4: Units R194 to R203 and Level 2, units R215 to R236; dark grayish brown (10YR3/2, moist) clayey silt loam mixed with fire-cracked limestone, chert, bone, and numerous (20–30 percent) broken and unbroken gastropods and bivalves.

The following strata occurred in the gully area within excavated units 130R224, 133R224, 136R224, 139R224, 127R227, 136R227, 124R230, 133R230, 136R230, 139R230, 145R230, and 133–136R136:

- Stratum D: Level 3: Dark grayish brown (10YR3/2, moist) clayey silt loam mixed with scattered fire-cracked limestone, gastropods and bivalves (20 percent)

- Stratum E: Level 4: Dense concentration (60+ percent) of bivalves (primarily unbroken) and gastropods; very little dark grayish brown (10YR3/2, moist) clayey silt loam.

- Stratum F: Level 5: Approximately one half of the deposit was comprised of broken and unbroken bivalves, gastropods, bone, fire-cracked limestone, chert, and shale fragments; the remainder was very dark gray (10YR3/1, moist) silt loam.

- Stratum G: Level 6: Soil and components identical to Stratum F except the bivalve accumulation was more dense (25 percent) and appeared layered rather than scattered throughout matrix.

- Stratum H: Level 7: Dense concentration (60+ percent) of primarily unbroken bivalves and numerous gastropods; very compact with little dark grayish brown (10YR3/2, moist) clayey silt loam.

- Stratum I: Level 8: Dark grayish brown (10YR3/2, moist) clayey loam mixed with fragments of limestone, a thin band of fire-cracked rocks, numerous shale fragments, and scattered (20 percent) gastropods and bivalves.

- Stratum J: Level 9: Dense, compact concentration (60+ percent) of bivalves and bone, chert, and fire-cracked rocks; some large fragments of shale; minor amount of dark grayish brown (10YR3/2) clayey silt loam.

- Stratum K: Level 10: Dark grayish brown (10YR3/2, moist) clayey silt loam mixed with extensive layer of fire-cracked rock and bivalves (20 percent) and a large percentage of bone.

- Stratum L: Level 11: Dark yellow brown sandy clayey loam with scattered fire-cracked rocks, chert and bone; no bivalve.

Strata D through L were not continuous throughout the gully. The depositional pattern of the site, along with radiocarbon dates collected from Stratum K (Level 10), Stratum H (Level 7), and Stratum C (Levels 3/4 and 2) (see Chapter VII) indicate the gully began to be in-filled during the earliest occupation of the site, ca. 3600±195 BP.[3] Radiocarbon assays obtained from Stratum H (3375±345 BP), and Stratum C (3185±165 BP, 3050±140 BP, and 2975±145 BP; mean=3070±150 BP) indicate this pattern of in-filling continued throughout the occupation of the site.

[3] Unless noted otherwise, all radiocarbon dates in this report are given as originally presented by Cridlebaugh, using uncalibrated radiocarbon years BP.

Gastropod and Mussel Bivalve Density

A 1-m² stratigraphic column was excavated from the south profile of 139R230. Ten-liter samples from each stratum were collected from laboratory determination of the percentages of each component of the midden. Failure to conduct this analysis in the field proved to be a serious error in the salvage excavation methodology, as the percentage data from these samples were subsequently lost when the samples were inadvertently confused with archaeobotanical samples and screened through 6-mm mesh without recording the volume of chert, rock, shell, and bone greater than 6-mm in diameter. However, an indication of percentage of shell fragments to soil was determined from various midden samples (Stratum C) which were screened through 6-mm mesh. All material 6-mm or less was screened through 2-mm and 1-mm U.S. Standard screens. Bivalve and gastropod remains ranging from 6-mm to 1-mm in diameter comprised approximately 30 percent of the volume, compared to 70 percent soil.

As a consequence, the percentages of molluscan remains indicated in the above stratigraphic descriptions are based on field estimates of volume from the 1-m² stratigraphic column, field estimates of percentage of shell to all other midden material from each strata, the 30 percent shell fragments from the screened samples, and Meighan's (1970) definition of shell middens which range from:

> …archaeological deposits containing 1 percent or less of molluscan remains (by weight) as well as deposits composed almost entirely of shell. A midden containing more than about 30 percent shell (by weight) appears visually to be almost pure shell since the other main components (rock and soil) have a greater density and occupy a smaller volume. (Meighan 1970:415)

V. SUBSURFACE DISTURBANCES

Subsurface disturbances are comprised of features, postholes, and burial pits which were intrusive into the midden or subsoil and exhibited distinct horizontal and vertical limits. Subsurface disturbances which occurred within the midden comprised of scattered bivalve shell and/or subsoil were easily identified by the dark grayish brown shell-filled sediments in contrast to the surrounding midden or light yellow-brown sandy subsoil matrix. Disturbances occurring within zones of concentrated mussel shell midden, however, were difficult to discern from the surrounding matrix. Nevertheless, a total of 134 features, 17 burials, and four possible postholes were identified and excavated at the Penitentiary Branch site.

This midden/disturbance matrix similarity created interpretative problems. For example, the point of origin of numerous subsurface disturbances detected at the midden-subsoil interface may well have been 0.2 to 0.4-m higher than the recorded elevation. The majority of recorded features were concentrated within the sloping south and southwest portions of the site (Figures 6 and 7) where the shallow depth of the dark shell-filled midden ranged from 0.2 to 0.5-m. Three hypotheses may be offered as explanation of prehistoric site development and use.

- **Hypothesis 1:** Prehistoric occupation primarily occurred directly on the highly eroded subsoil surface upon which occupational debris accumulated through time.
    - o **Implication:** Most subsurface disturbances originated below accumulated midden.
- **Hypothesis 2:** Prehistoric occupation primarily occurred directly upon accumulated occupational debris.
    - o **Implication:** Most subsurface disturbances were excavated through midden accumulation into subsoil.
- **Hypothesis 3.** Prehistoric occupation occurred variously upon the erosional surface and midden accumulation.
    - o **Implication:** Subsurface disturbances originated variously upon erosional surfaces and midden accumulation.

Features

Features were assigned consecutive numbers as each was identified and excavated. Several intrusive features were assigned additional A- and B- designations. The desired excavation procedure for identified features consisted of dividing the feature along an east-west axis, followed by removal of half the fill in order to inspect the remaining profile for stratigraphic evidence. Unfortunately, this procedure was successfully achieved during the excavation of a small percentage of features. In respect to both salvage time and financial considerations it proved impractical to excavate large blocky limestone and chert, fire-cracked rock, and shell-filled features in this manner. Consequently, a large percentage of features were shovel and trowel excavated without initial profiling. Archaeobotanical samples for flotation were recovered from all features and radiocarbon samples were discovered when possible. All fill was waterscreened through 12-mm or 6-mm hardware mesh. While screening feature sediment through 12-mm mesh was not a preferred recovery method, the quantity and quality of some fill necessitated this mesh size in several instances. Excavated features were photographed and their depth, diameter, and plan views recorded.

Of the 134 excavated features, 84 were intruded upon (or intruded onto) other features or burials (Figure 8). The actual undisturbed horizontal perimeters of only 37.3 percent (*n*=50) of the features could be conclusively determined. Dimensions of most features, therefore, are the greatest length and width observable at the time of excavation rather than a reflection of prehistoric dimensions. The consistent intrusion of subsurface disturbances at the site is indicative of intensive seasonal reoccupation through time.

Gross feature categories consist of Fired Clay Deposits/Hearth, Surface Rock Concentrations with Fire Pit/Hearth, Pits, Basins, Depressions, and Linear Disturbances. These categories are identified in Appendix A, and further subcategorized below. Specific measurement data for all feature categories is presented in Appendix B. Feature function of most categories is primarily speculative.

<u>Fired Clay Deposits</u> (*n*=3)

Fired Clay Deposits consist of fire-oxidized clay deposits and/or ground surface areas. Degree of oxidation ranges from red-orange to yellow soil discolorations. Both charcoal flecks and scattered rocks are commonly associated with these areas. Fired clay may be directly on the living surface or associated with a subsurface disturbance such as a pit.

Feature 10 consisted of a fired clay deposit surrounded by scattered limestone rock and shale slabs. Underlying the fired clay and contained within a basin were stratified layers of dark ash and charcoal, a lighter ash, and finally, a mixture of charred hickory nutshell, charcoal, and soil. Feature 21 was comprised of a red-orange fired clay deposit which had been overlain by a concentration of rocks and charcoal. Surrounding the fired clay was an irregular area of yellow-orange oxidized ground surface and scattered rocks, charcoal, and mussel shell. Feature 41 consisted of an irregularly fired ground surface with a mixture of charcoal, limestone fragments, and mussel shell. All fired areas exhibited fire-cracked rocks covering or enclosing the clay, and may have functioned as hearths.

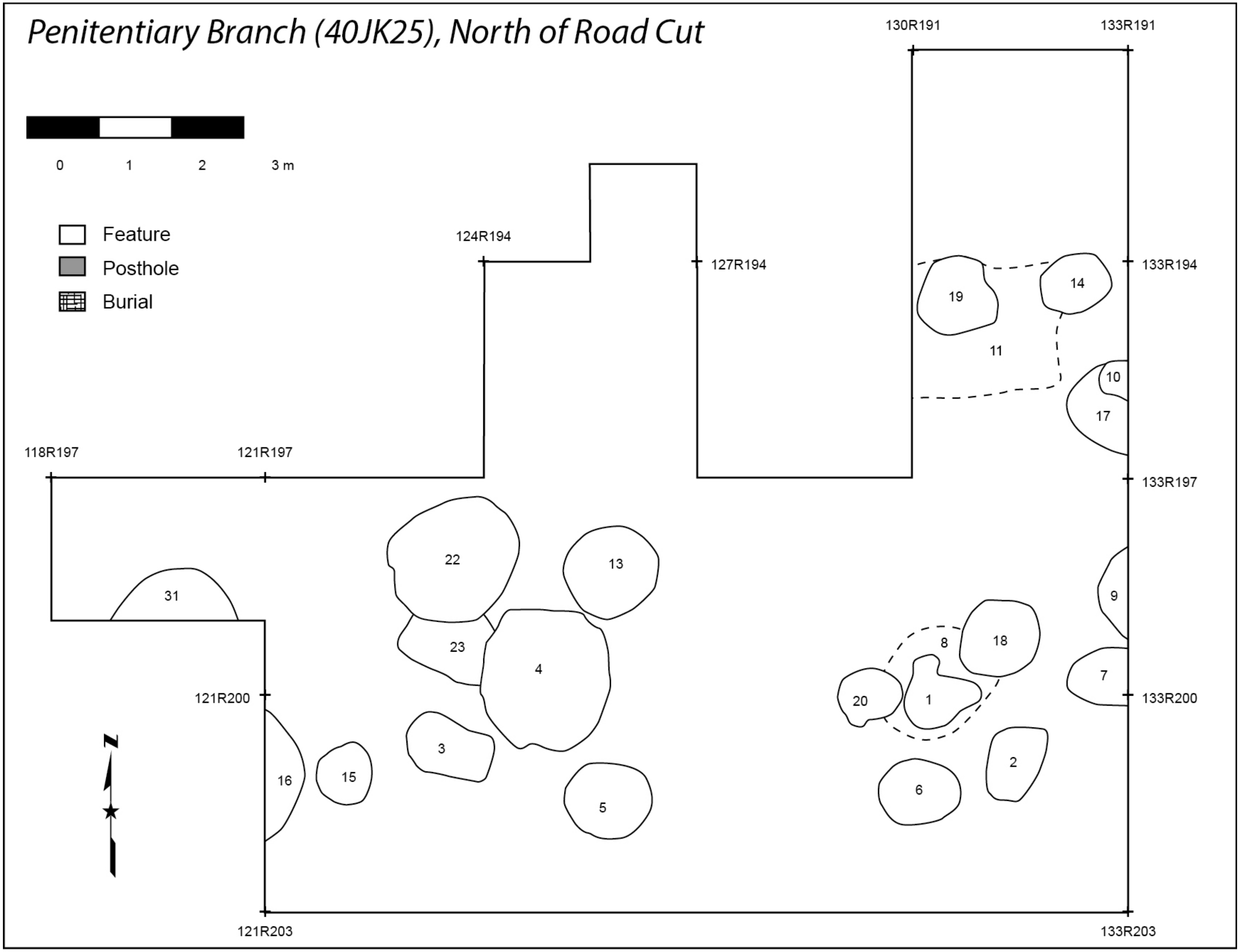

Figure 6. Plan view of cultural features, north of State Route 53.

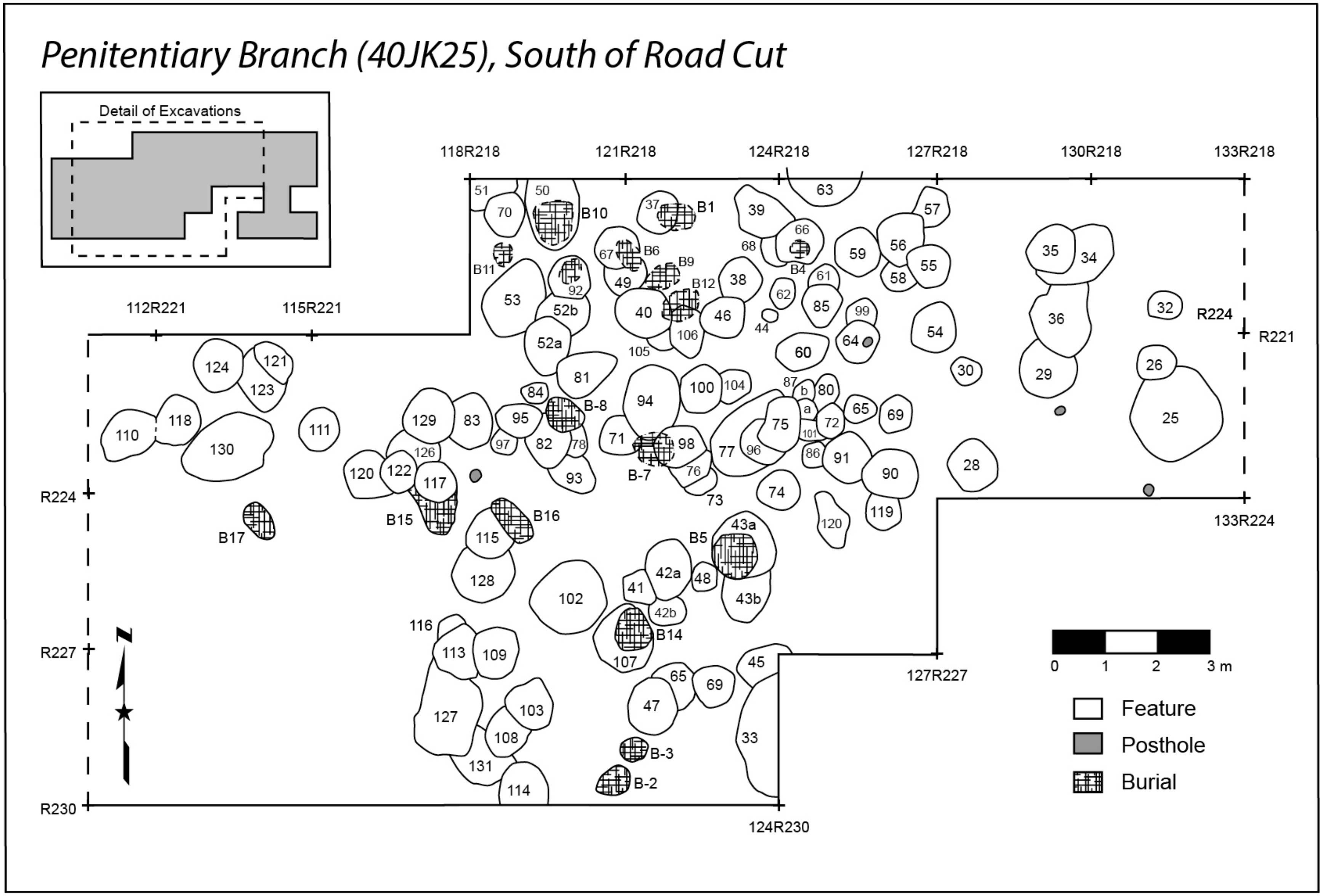

Figure 7. Plan view of cultural features, south of State Route 53.

Figure 8. Intrusive or superimposed subsurface disturbances.

Pits (*n*=73)

Pits are generally deep depressions exhibiting straight-sided to slightly sloping walls with flat or concave bases, and are oval or circular in plan view. Depositional material removed from pits consisted primarily of sediments mixed with limestone rocks, chert debitage, blocky chert, fire-cracked rock, and mussel and gastropod shells. Subcategories of pits are: Midden-filled; rock-filled/lined; Limestone and Shell-filled; and Mussel Shell-filled.

Midden-Filled Pits (*n*=32)

These pits contained a mixture of chert debitage, limestone, fire-cracked rock, charcoal, mussel shell, bone, and dark grayish brown clayey silt loam (Figure 9).

Rock Filled/Lined Pits (*n=25)*

These pits were characterized by large quantities of limestone, chert, and fire-cracked rocks concentrated near the pit base or mixed throughout the pit with lesser amounts of midden sediments than the Midden-filled pit category (Figure 10). The walls and bases of three of these pits (F-36, F-50, and F-103) were fire-oxidized displaying patches of red-orange clay. Contents were composed of rock and charcoal concentrations in the lower portion of the pits and mussel shell was dominant in the sediments of the upper fill.

Figure 9. Midden filled circular pits: Feature 25.

Figure 10. Rock filled/lined pit: Feature 14.

Rock and Shell Filled Pits (*n*=12)

This pit category contained fewer large rock concentrations than the Rock Filled/Lined Pits, and the fill was comprised of quantities of fire-cracked rocks, limestone, chert and whole bivalve shells (Figure 11).

Shell-Filled Pits (*n*=4)

These pits contained relatively no midden matrix or fire-racked rocks. Fill consisted of dense concentrations of bivalve shell, including both closed shells and single valves. These features are interpreted as possible shell caches (Figure 12).

<u>Basins</u> (*n*=52)

Basins are distinguished from pits in that they exhibit shallow sloping walls and rounded or flattened bases, and are oval to circular in plan view. In general, their depth is somewhat shallower than that of pits. Basin categories are similar to pit categories.

Midden-Filled Basins (*n*=21)

While practically all of the 52 basins contained some degree of midden matrix, this subcategory was predominantly filled with midden material comprised of a mixture of dark grayish brown clayey silt, bivalve shell fragments, bone, charcoal, chert, limestone and fire-cracked rocks. The most atypical of these features was Feature 88, composed of a concentration of limestone in the upper levels of the feature and a mixture of midden matrix underlying the limestone.

Rock Filled/Lined Basins (*n*=16)

This subcategory is characterized by fill comprised of large quantities of limestone, chert, and fire-cracked rocks concentrated at the base or throughout the feature. Features 45 and 58 showed greater evidence of serving as fire basins than the other features of this category. These two features were very shallow but filled with limestone rocks, charcoal, and ash; Feature 58 contained no bivalve shell.

Shell and Limestone Filled Basins (*n*=5)

This basin category may grade into the Rock Filled/Lined category, but the proportion of fire-cracked rock is less and there is a greater quantity of mussel shell.

Shell Filled Basins (*n*=9)

These basins contained dense concentrations of unopened and single bivalves. Like the Shell-Filled Pits, these features suggest shell caches.

Figure 11. Rock and shell filled pit, in profile: Feature 13.

Figure 12. Shell filled pit, in profile: Feature 3.

Depressions (*n*=5)

Depressions are shallow irregularly shaped features which fail to fall in either the pit or basin category due to their irregular shape. Depression fill was comprised of sediments similar to that of the midden: fire-cracked rocks, limestone, chert, broken bivalve shell, bone, and charcoal.

Linear Disturbance (*n*=1)

Feature 23, a deep linear disturbance, intruded to the north by Feature 22 and to the southeast by Feature 4. Fill consisted of fire-cracked rocks, limestone, chert nodules, chert debitage, bone, bivalve shell, and dark grayish brown clayey silt. It could not be determined if this feature presented a natural or cultural disturbance.

Tree Fall/Slump (*n*=1)

This midden-filled disturbance was highly irregular in shape and was determined to be associated with a tree stump or fall.

Discussion

The concentration of superimposed features at the Penitentiary Branch site is indicative of extensive occupational activities and seasonal reoccupation. Feature function was not readily revealed by shape or by artifact, sediment, or fire-cracked rock content. Varying concentrations of these items within the features suggest the majority of subsurface disturbances contained an undetermined percentage of primary or secondary midden material. No diagnostic feature patterning is identifiable in the lithic and faunal content.

The compacted concentration of bivalve shell within features classified as shell-filled pits and basins suggests these features were caches. Two similar clusters of disarticulated bivalves were excavated at the Robinson site (Morse 1967). At the Indian Knoll site on the Green River in Kentucky, concentrations of gastropod shell were associated with fire hearths and thought to have been deposited into piles subsequent to cooking (Webb 1946:243). However, no evidence of fire-oxidized soil was present within the shell-filled pits and basins at Penitentiary Branch. Of the 13 features in these categories, only two displayed characteristics which might be indicative of cooking. Feature 20, contained appreciable charcoal flecks and fired clay fragments, while Feature 110 was rock-lined in a manner suggestive of a cooking pit or earth oven. Instead, the majority of shell-filled pits and basins at Penitentiary Branch may have been created during food preparation, or as refuse pits employed subsequent to food processing/consumption. However, the presence of paired and unopened shells within these features casts a degree of doubt upon this latter interpretation.

Features classified as rock filled/lined pits and basins probably functioned as earth ovens. These features contained varying amounts of midden materials, but are uniformly characterized by extensive concentrations of fire-cracked rock, limestone, and charcoal fragments. The interior walls and bases of five of these features displayed fire-oxidized soil. That all 41 of these features functioned as earth ovens is likely an overly liberal interpretation. None of the Penitentiary Branch features exhibited evidence of clay lining as described for earth ovens identified at the Robinson site (Morse 1967:15).

The three fired clay deposits at excavated at Penitentiary Branch consisted of surface concentrations of fire-oxidized soil, charcoal, and fire-cracked rocks as well as small subsurface fire-oxidized pits which contained charcoal and ash. Based on their overall character these deposits are believed to represent hearths. Additional material recovered from Feature 10 consisted of one projectile point and one biface fragment. Fourteen faunal fragments were recovered from Feature 21, and one projectile point from Feature 41. Additional surface hearths may have been destroyed by later occupations or obscured by midden concentrations.

Postholes

Four postholes were identified at the Penitentiary Branch site (see Figure 7). Metric attributes for those features are provided in Appendix B. The points of origin within midden could not be distinguished for these features; consequently, measurements account only for the portion which extended into subsoil. Posthole 3 intruded into the base of Feature 64, a midden-filled pit. The few postholes at the site provide no indication of Late Archaic structure patterning. At the Robinson site, an arc of 10 postholes adjacent to a burned floor formed the basis for interpretation of a permanent round or oval house 9 to 12-m in diameter (Morse 1967:14). Burned areas and/or small numbers of aligned postholes arranged in an arc or single line have been reported from several other Late Archaic sites in the Mid-South, including at the Frazier, Cherry, and McDaniel sites in the western Tennessee River Valley. At Frazier a 24.2 m line of postholes was interpreted by Lewis and Kneberg (1947:2–6) as a windbreak. Along the Green River, Webb (1946:242) hypothesized similar features represented shelters erected to protect an open fire, but doubted they were indicative of enclosed structures.

At the non-shell midden Late Archaic Banks site (40CF34), located in the Nashville Basin on the T1 of the Duck River, an arc of at least seven postholes was associated with a living floor comprised of scattered burned clay and charcoal flecks (Faulkner and McCollough 1974:201; Figure 18). A similar posthole and living floor arrangement was identified at the Terminal Archaic Higgs site in the eastern Tennessee River Valley (McCollough and Faulkner 1973:58–59), where an arc of six postholes encompassed a living floor defined by a concentration of fire clay and charcoal fragments. Faulkner and McCullough (1974:207–211) theorize that these “partial” posthole patterns at numerous Late Archaic period sites in the Mid-South actually represent complete archaeological remains of simple structures such as windbreaks and cabanas. In this interpretation, these features constituted temporary protective structures utilized during milder seasons. Chapman (1981:129) has further cautioned archaeologists that the archaeological absence of postholes need not be interpreted as evidence for an absence of structures. For example, he postulates the use of existing trees as major supports in the construction of simple structures would have rendered additional support posts unnecessary.

VI. INHUMATIONS AND HUMAN SKELETAL REMAINS

Patricia A. Cridlebaugh, Emanuel Breitburg, and Deb Jones

Seventeen subsurface features excavated at the Penitentiary Branch site included human skeletal remains. Of those, 64.7 percent (*n*=11) were situated within nebulous burial pits. An additional three burials were within amorphous or partially defined formally prepared basins which extended into subsoil 0.1 to 0.2-m and were roughly rectangular in plan (Figure 13). The inhumations were located from approximately 0.15 to 0.6+ m below ground surface, and consequently several had been disturbed by historic cultivation. Four of the burials were primarily within the shell midden, while seven appeared to have been placed on unprepared subsoil. Whether these graves were actually placed on subsoil and subsequently covered with midden, or if the outlines of burial pits were obscured by the homogeneous midden matrix could not be determined.

Three burials were placed within well defined, formal features (Figure 14). Burials 5, 13, and 14 were interred within shallow oval (*n*=2) and circular (*n*=1) flat-bottomed basins which extended 0.45 m, 0.3 m, and 0.39 m into subsoil, respectively. These basins measured 0.55 x 0.42 m, 0.3 x 0.54 m, and 0.9 x 0.9 m in diameter, and were all situated at the base of larger pits (measuring 0.78 x 0.75 m, 1.3 x 1.25 m and 1.2 x 1.17 m in diameter at definition) which extended through the shell midden. One possible chain of feature formation process for these burials was as follows: A pit was excavated through the midden and/or into subsoil; a smaller burial feature was then excavated in the base of the pit; the body was placed within the smaller basin which was then infilled with a matrix of subsoil and midden; rocks were placed in the base of the larger pit atop the burial feature; and the larger feature was utilized as an earth oven.

The inhumations at Penitentiary Branch were situated within the southwest portion of the site on a slight rise immediately west of the intensive shell midden concentration. Within that area, seven burials were clustered within a radius of less than 3 m. The most isolated interment, Burial 17, was approximately 7 m west of this cluster. Approximately 3 m south of that cluster were seven additional burials in an area measuring 9 x 6 m (See Figure 7).

Remains of 17 individuals and three fetuses ranging from well preserved to fragmentary were excavated under the supervision of Cridlebaugh and Deb Jones. Final laboratory analyses and evaluation of the skeletal remains was conducted by TDOA skeletal biologist Emanuel Breitburg. Each burial is described below. Metric attributes for recovered skeletal elements are presented in Appendix C.

[redacted]

Figure 13. Burial 1 within questionable burial pit.

[redacted]

Figure 14. Burial 5 within round burial pit.

Burial 1

Unit: 124R2221, Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 39–44 years
Position: Tightly flexed	Sex: Male

Description:

Interment: No discernible burial pit (see Figure 13); interment was 55 cm below ground surface within the dark brown shell-filled Level 2 midden; inhumation partially intruded into F-37, a feature which was not discerned until removal of Burial 1.

Preservation: Well preserved but fragmented; nearly complete.

Position: Interred on right side and oriented to 94° with the head pointed southeast; left arm tightly flexed (0°) with left hand terminating at shoulder; right arm partially flexed (100°) and extending beneath legs; legs drawn to chest; left leg tightly flexed (20°); right leg tightly flexed (0°).

Pathology: *Dental*: Occlusal carie of right maxillary M1; moderate development of hypercementosis of dental roots. *Vertebral*: Degeneration of vertebra bodies most advanced on L-I, L-IV, and L-V of lumbar region; L-I angulated along anterior inferior margin and anterior superior margin; L-IV exhibits anterior inferior lipping; L-V exhibits pronounced lipping of inferior and superior borders of anterior aspect.

Anomalies: Lambdoid ossicle; Allen's fossa on right femur.

Discussion: The age assessment for Burial 1 is based on the smooth and inactive symphyseal surface of the pubis with a clearly visible oval outline and absent rim formation. These traits fit the criteria for Phase III of Todd's (1920) phases of pubic symphysis age. Factors indicative of a male include stature of 1.65 m, a flattened sacro-iliac surface, narrow sciatic notch, absence of a preauricular sulcus, V-shaped subpubic angle of the innominate, large mastoid processes, well-developed inion, and well developed supra-orbital ridges.

Burial 2

Unit: 121/124R230, Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 25–28 years
Position: Tightly flexed	Sex: Female

Description:

Interment: No burial pit discernible. Interment appears to be directly within Level 2 shell midden.

Preservation: Fair to fragmented. Skull and mandible absent and destroyed by historic cultivation. Recovered elements include: (Cranial) one mandibular molar; one maxillary incisor (Post-Cranial) vertebrae; sternum; right clavicle; right humerus; left and right ulnae; tarsals; metatarsals; phalanges of left hand; rib cage; right innominate; right limb elements; right foot tarsals, metatarsals, and phalanges.

Position: Interred on right side and oriented to 245° with the head pointed southwest; right arm tightly flexed (15°) right leg tightly flexed (0°).[4]
Pathology: None on recovered elements.
Anomalies: None.

Discussion: Intact skeletal elements of Burial 2 indicate the skull was deposited directly above Burial 3. Plow disturbance and lack of burial pit outlines render determination of the exact relationship of the two inhumations impossible. Age assessment of Burial 2 is derived from the sternal aspect of the clavicle which is not glazed over. Metrics of the femur head and the small gracile aspect of the bones suggest the individual was female.

Burial 3

Unit: 124R230, Level 2	Burial Type: Primary
Number of Individuals: 1	Age: Subadult
Position: Tightly flexed	Sex: Indeterminate

Description:
Interment: No burial pit discernible. Inhumation resting directly on subsoil and partially associated with/adjacent to Burial 2.
Preservation: Fair. Lower limb elements destroyed by possible intrusion. Recovered elements: (Cranial) frontal bone; right temporal bone; right maxilla with dentition; left mandibular portion with dentition; 39 cranial fragments (Post-cranial) 17 vertebrae portions; rib cage; right scapula; left and right humeri, ulnae, and radii.
Position: Interred on right side and oriented to approximately 220° with the head pointed southwest; left arm tightly flexed (0°); right arm flexed (45°).
Pathology: None.
Anomalies: Septal aperture of left humerus.

Discussion: Complete crown development of the maxillary and mandibular central incisors and the length of the humerus diaphysis indicate the child's age was between 3.5 and 5.9 years. The septal aperture of the humerus may indicate a female.

Burial 4

Unit: 130R221, Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 35–50 years
Position: Semi-flexed	Sex: Male

Description:

[4] No information on the positioning of Burial 2 was included in the original report.

Interment: Burial pit is an irregularly shaped amorphous pit with sloping walls and a slanted but relatively flat base which extends into the subsoil.

Preservation: Fragmentary and plow disturbed. Recovered elements: (Cranial) fragmentary occipital, parietal, right temporal, and malar portions (Post-cranial) all cervical vertebrae; thoracic vertebrae I-XII; lumbar vertebrae L-I and L-II; right arm and hand bones; partial left arm; highly fragmentary rib cage; left and right foot elements; ramus portion of left innominate.

Position: Interred on back right side and oriented to 160° with the head pointed southeast; left arm partially flexed (80°) with lower arm extending across abdomen; right arm tightly flexed (0°) with hand at shoulder; lower legs tightly flexed (0°) and drawn to chest.

Pathology: The atlas exhibits osteoarthritic conditions. C-III shows pronounced osteophytosis on the anterior inferior margin. C-IV shows arthritic involvement of superior and inferior anterior margins and lateral aspects and inferior and superior angulation of the body. C-V exhibits angulated superior aspect and pronounced osteophytic outgrowths of inferior and superior anterior margins. C-VI shows moderate deterioration and angulation of body. C-VII exhibits deterioration of lateral and anterior margins of superior aspect. Articular aspects of ribs exhibit osteophytic involvement. Moderate arthritic conditions of T-XI and T-XII.

Anomalies: Bipartite right cervical foramen of C-VI.

Discussion: Well-developed and robust mastoid processes, well-developed inion, a wide sciatic notch and presence of a preauricular sulcus, and the femoral head diameter are indicative of a male. Absence of critical skull and mandible elements creates age assessment difficulties; however, a dense diploë, osteoarthritis of cervical and thoracic vertebrae, and the deteriorated and flattened sacro-iliac articular surface of the innominate suggest an age range of 35–50 years.

Burial 5

Unit: 124R227, Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 50 years
Position: Tightly flexed	Sex: Male

Description:

Interment: Placed within a circular pit, F-43A (see Figure 14). Inhumation lay on subsoil at base of stratified pit including fire-cracked rock layer and dark soil with shell-filled matrix.

Preservation: Well preserved, nearly complete skeleton.

Position: Interred on right side and oriented to 137° with the head pointed southeast; left arm tightly flexed (0°); right arm semi-flexed beneath chest at 50°; both legs tightly flexed (0°) and drawn to chest.

Pathology: *Cranial*: Posterior aspect of maxillary dental arcade severely abscessed; mandibular dentition nearly complete with apical abscesses at right P3 and M2; exostosis of left mandibular fossa. *Post-cranial*: Pronounced osteoarthritic vertebral involvement; *C-II:* osseous build up on the dens of the epistropheus; *C-IV*: severely distorted by arthritic involvement with degeneration of left and right lateral aspects of body; *C-V*: pronounced lipping on inferior margin; lateral articular surface distorted. *C-VI*: lateral aspect of body involved. *T-I*: marginal lipping of superior margin. *T-II*: osseous development of lateral articular surfaces. *L-I*: marginal lipping of inferior and superior aspects. *L-II*: pronounced lipping of anterior margin extending 16.5 mm from body; anterior angulation of vertebra body. *L-III and L-IV*: osteophytosis of anterior margin of vertebral bodies. *L-V*: body angulated in a posterior direction with pronounced lipping of right lateral inferior margin. *Innominata*: sacro-iliac articular surfaces exhibit nodular outgrowths and a deterioration of articular surface.

Anomalies: Incomplete supra-orbital foramen; left parietal foramen.

Discussion: This inhumation was interred at the base of a straight-walled circular pit 1.2 x 1.17 m in diameter and 0.3 m deep. Pit matrix consisted of dark charcoal-filled soil, random chert nodules, and mussel shell. Underlying this matrix was a layer of fire-cracked rocks indicative of a hearth. Removal of the rocks from the base of the hearth revealed a mixture of midden and mottled burial fill and the inhumation. The inhumation lay within a shallow circular sub-basin 0.9 x 0.9 m in diameter; depth from base of F-43 to base of burial pit was 15 cm.

Male sexing of Burial 5 was based on pronounced supraorbital ridges, large mastoid processes, well-developed inion, and robust square-chinned mandible, long bones, and femoral head diameter. Factors indicative of an individual 50 years of age included severe and uneven wear of the maxillary and mandibular arcades; maxillary wear extended to or below the cervical neck of the right I1, I2, C1 and P3 with extensive abscessing, tooth loss, and alveolar resorption. In addition, deterioration of the symphyseal rim and rarefaction of the deeply pitted face conform to Phase X (Todd 1920) indicative of an individual in the fifth decade of life.

Burial 6

Unit: 121/124R221, Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 35–50+ years
Position: Semi-flexed	Sex: Female

Description:

Interment: No burial pit discernible; skeletal remains deposited in subsoil. Features 49 and 67 were intrusive over the burial, post-date the inhumation.

Preservation: Well preserved and nearly complete.

Position: Interred on back left side and oriented to 125° with the head pointed southeast; right arm semi-flexed (59°) with lower arm extending across abdomen; left arm semi-flexed (105°) with hand at left knee; right leg tightly flexed (25°); and left leg tightly flexed (20°).

Pathology: *Cranial*: Dentition worn to dentin; maxillary dentition exhibits loss of left M1 and M2; occlusal caries of M2 root; right P3, P4, M1, M2, and M3 lost and alveolus healed; all mandible dental elements retained; apical abscessing of left I2, right I1, and healed apical abscess of right M2. *Post-cranial*: Osteoarthritic involvement of cervical, thoracic, and lumbar vertebrae.

Anomalies: Small septal aperture of right humerus; supra-orbital foramina notched.

Discussion: Despite a well-developed inion and supra-orbital ridges, post-cranial elements suggest a female. These characteristics included the following: presence of the preauricular sulcus of the right innominate; maximum diameter of the femoral head (38.0 mm); a wide sciatic notch; and a short femur (423.0 mm). Fragmented, worn, or absent elements hamper age determination. Age degenerative characteristics include: extensive tooth loss, extreme alveolar resorption of the maxilla, apical abscessing, moderate Pacchionian granulation, the depth of depression of the meningeal arterial network, the density of diploë, and osteoarthritic involvement of vertebrae. Height is estimated at 1.57 m.

Burial 7

Unit: 124R224, Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 35+ years?
Position: Tightly flexed	Sex: Female?

Description:

Interment: Amorphous rectangular (?) pit excavated into subsoil.

Preservation: Poor; numerous elements destroyed by plowing activity; recovered elements include: 11 vertebrae portions, left rib sections, left radius and phalanges; left and right innominate bones; fragmented left and right femora, fibulae, and tibiae.

Position: Interred on left side and oriented to approximately 18° with the head pointed northeast; left arm flexed tightly at 0°; left and right legs tightly flexed (0°).

Pathology: Osteoarthritic involvement of lumbar vertebrae.

Anomalies: Osseous development along articular rim of left distal radius.

Discussion: Fragmentary cranial and post-cranial elements require approximated ageing and sexing. Age assessment of 35+ years is based on osteoarthritic involvement. The individual is assumed to be female on the basis of small bones and stature estimate of 1.54 m.

Burial 8

Unit: 121R224, Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 35+ years (?)
Position: Indeterminate	Sex: Female

Description:

Interment: Indeterminate.

Preservation: Poor; severely disturbed by plowing; remains include: three portions of the left femur, portions of left and right tibiae; an innominate portion; a right calcaneum; one first metatarsal.

Position: Indeterminate.

Pathology: None observed on fragmentary remains.

Anomalies: Osseous development along iliac crest and sacro-iliac articular surface.

Discussion: Deep pitting of the preauricular sulcus of the left innominate is indicative of a female. An age assessment of greater than 35 years is based upon osseous development of the iliac crest and sacro-iliac articular surface.

Burial 9

Unit: 121/124R221, Level 2	Burial Type: Primary
Number of Individuals: 4 (1 Adult, 3 Prenatal)	Age: 30–35 years
Position: Semi-flexed	Sex: Female

Description:

Interment: No discernible burial pit; possible association with Burial 6, the skull of which overlays the left innominate and forearm of Burial 9; neither burial disturbed the other.

Preservation: Well represented but fragmented.

Position: Adult interred on right side and oriented to approximately 239° with the head pointed southwest; left arm slightly flexed (149.5°) with hand at left hip; right arm slightly flexed (120°) with hand in abdominal region; left leg tightly flexed (25°) and right leg flexed (12°) and drawn to chest.[5]

Pathology: None.

Anomalies: Complete multiple supra-orbital foramina; wormian bone at lambda; bilateral bipartite foramina C-VI; additional cusp on buccal aspect of left mandibular M3; septal aperture of left humerus.

Fetal remains: Incomplete and fragmented remains of at least three prenatal individuals were located near but not within the abdominal region of Burial 9. Remains include fragmented cranial, vertebrae, rib and long bone portions. *Clavicles*: one left and three right (three individuals).[6] *Humeri shafts*: two left; one right. *Ulnae shafts*: three. *Femora*: two matching pairs. *Tibia*: two matching pairs.

[5] The position and orientation of the fetal remains is not noted in the original report or on skeletal analysis forms.

[6] Examples of triplets are extremely rare in the archaeological record of prehistoric eastern North America, raising the possibility that one of the three right fetal clavicles from Burial 9 was sided incorrectly.

Discussion: The adult's dentition was complete but the pubic symphysis was absent. Calculation of the individual's age is based upon complete dentition which shows moderate dentin exposure of the occlusal surfaces and no degeneration of the alveolar portions of the maxilla and mandible. Although the third molars are worn flat, dentition and the absence of osseous development suggest an age of less than 35 years. Criteria for female sexing are undeveloped inion, mastoid processes, and supra-orbital ridges. In addition, a gracile skull and mandible, presence of preauricular sulcus, and the femoral head diameter are indicative of a female. Stature of this individual is approximately 1.54 m.

The location of at three prenatal individuals near the abdominal region of the adult female may indicate she died while gravid or as a result of spontaneous abortion of the fetuses which were at an early stage of development (see metrics). Two tibiae of eastern box turtle (*Terrapene carolina*) were associated with the fetal elements.

Burial 10

Unit: 121R221, Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 35–39 years
Position: Tightly flexed	Sex: Male

Description:

Interment: Inhumation resting on subsoil, with no burial pit discernible; F-50 intrusive with skull at base of feature.

Preservation: Well preserved and nearly complete; cranium intact.

Position: Interred on right side and oriented to approximately 38° with the head pointed northeast; situated with chest and face down; left arm tightly flexed (0°); right arm flexed (90°) under the chest; left and right legs tightly flexed (0°) and drawn to chest.

Pathology: Osteophytic involvement of vertebral margins of T-I and L-I.

Anomalies: Septal aperture of left humerus slightly greater than 1.0 mm.

Discussion: Although the skull of Burial 10 was at the base of the intrusive F-50, it was undamaged and recovered intact. Support for age assessment of 35–39 years includes the following: a fragment of the pubic symphysis of the innominate conforms to Todd's (1920) Phase VII. The teeth exhibited moderate wear, while the skeleton showed marginal osteophytic involvement of the inferior and superior margins of the T-I and L-I vertebrae. This individual exhibited a robust and well developed cranium, mastoid processes, inion, protruding supra-orbital ridges, ruggedly everted gonial angles, and large long bones indicating a male individual. Stature is estimated at 1.63 m.

Burial 11

Unit: 121R221 , Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 0.5 years
Position: Tightly flexed	Sex: Indeterminate

Description:

Interment: No discernible burial pit; inhumation was in Stratum C midden and immediately below plowzone; shovel excavation disturbed.

Preservation: Poor and fragmented, including 240 fragments and portions of left and right arms and hands, left and right innominate bones, and left and right femora and tibiae.

Position: Interred on right side and oriented to approximately 335° with the head pointed northwest; arms and legs tightly flexed at 0°.

Pathology: None observed

Anomalies: None

Discussion: Mandible, maxilla, and dental elements are absent. Age assessment is based on analogous long bone (femur, ulna, and radius) lengths of Arikara Indians ages 0.5 years (Merchant and Ubelaker 1977). The measurements of the Penitentiary Branch individual also correlate well with those of similar age assessment from Indian Knoll.

Burial 12

Unit: 124R221, Level 2	Burial Type: Primary?
Number of Individuals: 1	Age: 40+ years
Position: Tightly flexed	Sex: Female

Description:

Interment: No burial pit discernible; lower torso and legs of inhumation disturbed and commingled by intrusion of F-40.

Preservation: Disturbed and fragmented; *Cranial*: 20 left and 18 right portions of frontal, parietal, and occipital bones: three fragments of left mandibular ramus; five fragments of right mandibular ramus with dentition. *Post-cranial*: 30 vertebrae and 72 rib fragments; left and right humerus, ulna, and radius; portions of femur; left and right tibiae and metatarsals.

Position: Interred on the back and oriented to approximately 63° with the head to the northeast[7]; arms tightly flexed (0°).

Pathology: Mandibular dentition heavily worn; dentin exposed to cervical necks of left P3, P4, M1, M2, M3 and right P4, M1, M2, and M3; pulp cavities exposed by attrition on buccal aspects of left M1, M2, and right M2[8]; massive resorption of alveolus; some

[7] According to burial notes the head was turned at 180° to the axis of the body, facing south.
[8] See Hodge and Davis (2013) for a discussion of potentially similar dental pathologies.

teeth held by apex of root; apical abscessing on buccal aspect of left M1 and right C1; advanced hypercementosis of dental roots. Osteoarthritis on phalanges.

Anomalies: None

Discussion: Age assessment is based on the degenerative pathologies of dentition and osteoarthritis discussed above. Designation of the individual as female is derived from characteristics which include moderate development of the inion, supra-orbital ridges, and mastoid processes; and gracile bone development.

Burial 13

Unit: 121R221 , Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 5.5–6.0 years
Position: Tightly flexed	Sex: Indeterminate

Description:

Interment: Inhumation at base of oval shallow pit (F-92); underlying rock lined base;

Preservation: Fragmentary but nearly complete.

Position: Interred on right side and oriented to approximately 54° with the head to the northeast; left arm flexed (69°) with hand terminating at left knee: right arm flexed (90°) with hand in abdominal region; left leg tightly flexed (22°); right leg tightly flexed (24°).

Pathology: None detectable

Anomalies: Bilateral Carabelli's cusps on left and right maxillary M1; cusp is distinct.

Discussion: Burial 13 was interred at the base of a shallow oval pit filled with shell-filled midden and lined with a layer of fire-cracked rocks; the inhumation underlay the rocks and rested within the subsoil. The pit diameter was 55 x 42 cm with a depth of 30 cm; depth from burial surface to base was 10 cm.

Both deciduous and permanent dental elements were recovered from Burial 13. The left mandibular M1's exhibit ¾ root development indicative of 5.5 years; 6.5 years is indicated by complete crown/cleft of the left and right mandibular M2's. An age assessment of 5.5–6.0 years was derived as a result of this combination of characteristics.

Burial 14

Unit: 121/124R227, Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 50+ years
Position: Moderately flexed	Sex: Male

Description:

Interment: Interred in shallow, oval burial pit at the base of F-107.

Preservation: Well preserved and nearly complete.

Position: Interred on left side and oriented to approximately 80° with the head to the south; right arm flexed (70°) with hand terminating at knees; left arm flexed and hand terminated at shoulder; both legs tightly flexed (30°); body in fetal position.

Pathology: *Cranial*: Erratically worn dentition; maxillary dentition worn below cervical neck; pulp cavities of right maxillary M1 and M3 exposed by attrition; distal caries on occlusal surface of right maxillary M3; severe abscesses in apical regions of right mandibular M1, M2, and M3; massive resorption of alveolus; abscessing and alveolar resorption on buccal aspect of left M2. *Post-cranial*: T-VIII through T-XI and L-I through L-V exhibit distorted bodies and varying degrees of arthritic involvement; lipping on left lateral aspect of inferior margin of L-I; pronounced lipping on anterior superior margin and left lateral inferior margin of L-II; moderate superior margin lipping and pronounced lipping on inferior aspect of anterior margin of L-III; anterior superior and inferior margins of L-IV involved; slight osteophytosis of lateral inferior and superior aspect of vertebral body margin of L-V; osseous manifestations on radius, innominates, and phalanges.

Anomalies: Multiple complete and incomplete supra-orbital foramina.

Discussion: The shallow, oval grave shaft of Burial 14 was excavated into the base and side of F-107, a rock and shell filled pit measuring 1.3 x 1.25 m in diameter and 0.29 m in depth. Burial fill was identical to the dark soil, rock, and shell-filled matrix of F-107. The depression containing the inhumation measured 30 x 54 cm in diameter.

Age determination of the individual is based on a dense diploë; persistent Pacchionian granulation along the sagittal suture (some large and deeply depressed); lightly depressed meningeal arterial network cranial sutures closed endocranially and ectocranially for the coronal, sagittal, and lambdoidal sutures; dental wear and deterioration; and osteoarthritic involvement (see pathology).

Characteristics which classify this individual as male are robust and well developed mastoid processes, supra-orbital ridges, and a slightly developed inion. The gonial angles are everted; the chin is square; and the mandible is rugged. The long bones are those of a robust individual whose stature was 163.5 ± 3.147 cm.

Burial 15

Unit: 118R227, Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 50+ years
Position: Tightly flexed	Sex: Female

Description:

Interment: Inhumation within a depression of indeterminate shape or dimension which extends 0.1 m into subsoil; intruded by F-117.

Preservation: Post-cranial elements well represented; cranial elements destroyed by F-117 intrusion.

Position: Interred on right side and oriented to approximately 43° with the head to the northeast; left arm semiflexed (50°); right arm tightly flexed (0°) and drawn towards the chest; legs are tightly flexed approaching 0°.

Pathology: Extensive arthritic involvement of distal aspect of left ulna or possibly traumatic fracture remodeling of bone; pronounced lipping of inferior and superior margins (extends 5–8 mm from original margin) of two vertebral body fragments; osteophytosis of anterior margins of superior and inferior aspects and compression and distortion of the body of two lumbar vertebra portions; osteophytic involvement of anterior margins of one thoracic vertebra.

Anomalies: Septal aperture of left humerus.

Discussion: A superior fragment of symphyseal face of the left innominate displays a deteriorated ventral border and a severely eroded face conforming to Phase X of pubic symphysis age changes (Todd 1920). In addition, extensive osteophytic involvement indicates an individual of 50+ years. Long bone measurements suggest height of 1.482 ± 0.38 m in height. The size of the femoral head; a small septal aperture on the humerus; and left and right innominate bones which display a deeply pitted preauricular sulcus and a deep wide sciatic notch are all indications of a female.

Burial 16

Unit: 121R227, Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 50+ years
Position: Tightly flexed	Sex: Male

Description:

Interment: Somewhat indeterminate burial pit of indeterminate width but possibly rectangular shape 1.1 m in length and 0.2 m deep intruded by F-115.

Preservation: Disturbed vertebra column by F-115 intrusion but good preservation; all elements recovered.

Position: Interred on left side and oriented to approximately 337° with the head to the northwest; both arms tightly flexed (0°) and drawn to chest; both legs tightly flexed (0°) and drawn toward chest.

Pathology: *Cranial*: Dentition of right maxillary C1 worn below cervical neck with pulp exposure from attrition; occlusal caries and mesio-distal wear of right P4; left maxillary P4 worn to and decayed within pulp cavity; apical abscess of M2; mandibular C1 pulp caries; P3 and P4 erratically worn; apical abscess of M2; right mandibular attrition of I1 and I2 below cervical neck; occlusal caries of C1; antemortem loss of P3, P4, and M1; severe hypercementosis of tooth roots. *Post-cranial*: Atlas, thoracic, and lumbar portions exhibit osteoarthritic involvement; osseous involvement of articular aspects of ribs; severe arthritic involvement of elbow and knee joints.

Anomalies: Left parietal foramen perforates vault; multiple complete and incomplete supra-orbital foramina.

Discussion: Characteristics of an individual 50 years or older include: the coronal, sagittal, and lambdoid sutures are complete endocranially and ectocranially; dense diploë; Pacchionian granulation is moderate with occasional deep pitting; the meningeal arterial depressions are insignificant in depression; extensive toothwear and loss; bone remodeling; and pronounced post-cranial osteophytosis. A well-developed cranium, protruding supra-orbital ridges, large molars, a pronounced inion, large mastoids, a pelvis characteristic of a male, large long bones, and stature of 1.677 ± 0.28 m (based on tibia length) are indicative of a male.

Burial 17

Unit: 115R227, Level 2	Burial Type: Primary
Number of Individuals: 1	Age: 6± years
Position: Flexed	Sex: Indeterminate

Description:

Interment: No discernible burial pit; burial severely damaged by plowing; inhumation within Level 2 midden and subsoil. Preservation: Poor; fragmented and incomplete due to tilling disturbance.

Position: Interred on left side and oriented to approximately 135° with the head to the southeast; left arm semi-flexed (90°); right arm flexed (50°); left leg flexed (40°); right leg flexed (45°).

Pathology: None observed on recovered fragmentary remains.

Anomalies: None observed

Discussion: The mandibular dm1 and dm2 are those of a 5.5 to 7.0 year old while the mandibular permanent molar development is that of a 6.0 to 6.5 year old.

Interpretation

The Penitentiary Branch site mortuary sample is relatively small (*n*=17), but provides valuable information pertaining to the behaviors of the site occupants. Moreover, it contributes additional comparative Late Archaic period mortuary data for the Southeast.

All of the Penitentiary Branch interments were articulated primary inhumations in a flexed position, resting primarily on the right or left side. Eleven individuals were tightly flexed, three were semi-flexed, two moderately flexed, and one indeterminate flexed. Body position showed no covariation in relationship to age, sex, or pathology. However, male (*n*=6) body orientation was northwest-southeast (*n*=5) or northeast-southwest (*n*=1); female (*n*=7) orientation was northeast-southwest (*n*=4), northwest-southeast (*n*=1), and indeterminate (*n*=2) while children (*n*=4) were oriented in a variety of directions.

Criteria for age, sex, and stature estimates involved a variety of variables, however, those criteria established by Todd (1920), Hunt and Glesier (1955), Genovés (1966), and Trotter and Gleser (1952; 1958) were stressed. Age estimates indicate the average male life expectancy was approximately eight years greater than females. Age assessments for males range from 35–50+ years with a mean of 45+ years. Females range from 25–50+ years with a mean of 37+ years, while children range from 0.5–6+ years and a mean 4.2 years. In comparison, the mean ages of the Late Archaic population at the Late Archaic Robinson site were 29.4 years for males and 30.6 years for females (Morse 1967:135).[9]

Adult male stature ranged from 1.63 to 1.67 m with a mean 1.65 (*n*=6) (SD ± 1.63 cm); females ranged from 1.48 cm to 1.56 m with a 1.53 m (*n*=4) mean (SD ± 3.69 cm). On the basis of mean stature estimates, Penitentiary Branch males were 11.9 cm taller than females. Robinson site males and females were slightly taller with respective means of 1.67 and 1.54 m (Morse 1967:135).

Extensive tooth loss, wear, and caries were characteristic of the adult Penitentiary Branch population. This dental attrition may be partially attributed to a diet which included grit derived from such sources as bivalves. Morse (1967:135) noted similar dental attrition among the population at the Robinson site, which he attributed to this same cause. All of the Penitentiary Branch adult males and four of the older females exhibited various stages of osteoarthritic involvement. None of the skeletal remains exhibit evidence of trauma. Consequently, with the exception of Burial 9, the assumed primary causes of death were disease and age degenerative factors. The presence of at least three fetuses near the pelvic region of Burial 9 indicates cause of death may be related to pregnancy complications.

No grave goods were associated with any of the Penitentiary Branch site inhumations. Two eastern box turtle tibiae associated with fetal elements of Burial 9 were unmodified and are not believed to represent a cultural inclusion. The absence of grave furniture is unusual in comparison to the evidence of utilitarian, ceremonial, and exotic artifacts which accompanied burials from Late Archaic cemeteries at the nearby Robinson site, the Indian Knoll site in Kentucky, and the Eva and Cherry sites on the Lower Tennessee River. The percentage of burials accompanied by grave goods at these sites was less than 50 percent. For example, 37 percent of the Eva and 40 percent of the Cherry site (Magennis 1977) burials included grave offerings, while 21 percent of the Robinson site burials were accompanied by associated artifacts. An additional dissimilarity was the absence of dog burials at Penitentiary Branch. Those canid elements that were recovered are described in Chapter IX.[10]

Other than body orientation, no mortuary patterning was evident. With the exception of

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[9] See Deter-Wolf (2004); Deter-Wolf et al. (2004); and Hodge and Davis (2013) for additional data on Archaic skeletal populations from the Cumberland River Valley.
[10] See Peres et al. 2013; and Fleming 2006 for additional discussion of Archaic dog burials in the Cumberland River Valley.

the slightly isolated Burial 17 (see Figure 7), males, females, and children were interred without differential treatment in an area measuring approximately 12 x 12 m that may perhaps represent an intentional cemetery grouping. While human skeletal remains provide skeletal, mortuary, and demographic data regarding the Penitentiary Branch site, the exact number of interments present at this location prior to historic agriculture and road construction cannot be positively ascertained.

VII. CHRONOLOGY

Material collected for radiocarbon dating from unit levels and features at Penitentiary Branch consisted of charred wood and nutshell. Six samples comprised primarily of carbonized wood fragments were submitted to the University of Georgia and Geochron Laboratories for radiocarbon assay. Each reported carbon date was corrected on the basis of dendrochronological calibrations established by Damon and colleagues (1974).[11]

Table 1. Radiocarbon dates from the Penitentiary Branch site.

Sample	Feature	Unit	Level	C-14 Age BP	Corrected Age BP	Calibrated Age BC
GX-8584	91	127R224	2	2975±145	3211±277	1261
UGA-1628*	94	121R224	2	3185±165	3478±336	1528
UGA-1627*	10	133R197	3/4	3050±140	3307±293	1357
GX-8583	--	136R231	6	2370±205	2453±221	503
UGA-1626*	--	133R224	7	3375±345	3727±493	1777
GX-8582	--	136R230	11	3600±195	4021±464	2071

* Originally reported in Cridlebaugh 1981:4

Samples GX-8582, UGA-1626, and GX-8583 consisted of charred wood and nutshell fragments collected from stratified layers exposed in the profiles of units excavated within the midden-filled erosional gully. Each of the major stratified layers was comprised of varying concentrations of bivalves and midden sediments (Chapter IV).

Sample GX-8582 was collected from one of the lowermost cultural strata, Stratum L (Level 11) of Unit 136R230. This zone, which underlay a layer of bivalve shell and fire-cracked rock, was comprised of yellow-brown clayey soil mixed with large rocks, charcoal and shale fragments, bone, and lithic debris. An uncorrected radiocarbon determination (BP) of 3600±195 confirms this as the earliest depositional zone at the site.

Sample UGA-1626 returned a date of 3375±345 BP from Stratum H (Level 7) one of the earlier depositional layers within Unit 133R224/227. The matrix of this lens was comprised of a dense concentration of mussel shells and gastropods, dark grayish brown clayey silt loam, bone, chert, and charcoal fragments.

Sample GX-8583 presented an incongruous date of 2370±205 BP for Stratum G, Level 6, Unit 136R231. The two earlier dates discussed above, the depositional sequence of Stratum G, and dates from levels discussed below suggest this date is unreliable. Level 6 was comprised of dark gray silt loam with quantities of fire-cracked rock, mussel, shell, bone, lithic material, and small patches of buried clay.

[11] See Peres and Deter-Wolf (2016) for a re-examination and INTCAL-13 calibration of radiocarbon dates from Penitentiary Branch, Robinson Shell Mound, and other shell-bearing Archaic sites throughout the Cumberland River Valley.

Sample UGA-1627 returned a date of 3050±140 BP for carbonized wood and nutshell from Feature 10, Level 3 (Stratum C). This feature was a hearth or fire pit with a surface rock concentration. The fire pit, directly underlying the rock concentration, was filled with four layers of ash thus indicative of successive firing. The pit walls and base exhibited red-orange discoloration indicative of oxidation. A Category 3 (Big Sandy) projectile point was recovered from one of the ash lenses.

Sample UGA-1628 was recovered from Feature 94, a large circular pit which had been capped with a layer of fine sandy light brown soil with large pieces of charcoal. The fill above and below this layer was comprised of blocky limestone, chert, burned and unburned mussel shell, bone, lithic debitage, and charcoal. Charcoal, derived from the lower half of the pit, was dated at 3185±165 BP.

Sample GX-8584 was recovered from Feature 91, a circular pit which exhibited oxidation on the interior walls, and a base lined with large fire-cracked rocks and limestone. Fill consisted of dark brown clayey soil mixed with scattered fire-cracked rocks, mussel shell, bone, lithics, and charcoal. The radiocarbon assay of 2975±145 BP also provides a date for cucurbit remains identified in feature sediments.

A mean date of 3093 BP may be derived from the radiocarbon determinations. With the exception of the 2370 BP date, all remaining assays appear to complement the archaeologically interpreted sequence of deposition, and yield a mean date of 3237 BP. Radiocarbon analysis therefore suggests the site was utilized for approximately 625 years from 3600 to 2975 BP. These dates, which compare favorably to those from the Robinson site (Morse 1967:143), place Penitentiary Branch in the Late/Terminal Archaic period, with Penitentiary Branch settlement only about 400 years earlier than Robinson.

VIII. PALEOENVIRONMENTAL EXPLOITATION PATTERNS: PALEOBOTANICAL DATA

Time transgressive pollen diagrams have provided the evidence for paleoenvironmental reconstructions which document dramatic changes in the regional distribution of forest types in the Southeastern United States (Delcourt and Delcourt 1981). On the basis of palynological analyses (Delcourt 1979; Delcourt and Delcourt 1981) the Penintentiary Branch areal forest vegetation from 25,000 to 200 yr BP can be extrapolated. The study area was dominated by jack pine-spruce forests at 25,000 and 18,000 BP. By 14,000 BP, during the later glacial and the onset of the Laurentide retreat, vegetation was primarily spruce-jack pine.

The increase in Holocene temperatures and precipitation forced the dramatic replacement of the spruce-jack pine forest by Mixed Mesophytic forest taxa at approximately 10,000 BP. Continued climatic change resulted in a predominantly oak-hickory forest with remnant mesophytic species by the year 5000 BP. Around that time, the mixed mesopytic forest retreated to the east forming the dominant vegetation of the Eastern Highland Rim. This pattern of oak-hickory forest in the outer Nashville Basin and Mixed Mesophytic taxa on the Highland Rim persisted and formed a regional forest interspersed with cove hardwoods or remnants of mixed mesic forest growing in favorable moist forest habitats such as low terraces, ravines, and gorges dissecting the hills and bluffs. The forests of the Penitentiary Branch locale during the approximate 4500 to 2700 BP site occupation, therefore, were dominated by oak-hickory species intermixed with Mixed Mesophytic taxa.

The Archaeobotanical Sample

Major quantities of archaeobotanical samples (*n*=145) were systematically recovered from features and excavation levels during the Penitentiary Branch site excavations. These 9.5-liter sediment samples were collected primarily from features (*n*=130). Due to extremely cold water temperatures during field excavations, the preferred flotation method of immersing each sample in a reinforced mesh-bottomed tub within free running water (Struever 1968) could not be conducted. Instead, samples were stored in plastic collection bags and subsequently performed in a laboratory setting utilizing running tap water and a small barrel-type flotation device (Watson 1976). Initial attempts at flotation revealed that the extensive bivalve and gastropod remains within the soil matrix hampered and/or prevented recovery of charred plant debris. To alleviate this problem, sediment samples were dry screened through 6-mm hardware mesh, thereby removing all shell greater than 6-mm. Nevertheless, extensive amounts of fragmentary shell (approximately one third of the matrix volume) continued to suppress the flotation of charred plant fragments, and shell and rootlets obscured/contaminated those that floated to the surface. Ultimately as a result of these issues and both time and financial restrictions, approximately 50 percent (*n*=70) of the collected samples were processed.

Laboratory Analyses

Laboratory analysis of the carbonized nutshell, seed, and fruit material was conducted by Cridlebaugh, while the wood charcoal was identified by Andrea Shea. Comparative collections for wood charcoal and seeds were employed as identification aids in conjunction with reference literature (Martin and Barkley 1961; Panshin and de Zeeuw 1964). Each paleoboanical sample was dry sifted through a series of U.S. Standard screens with mesh sizes of 2 mm, 1 mm, and 500 microns. Material with diameters greater than 2 mm was sorted by genus and species, and the weight of each plant taxon was determined for each sample. The remaining sieved fractions were examined for seeds, fruits, and cucurbit fragments. Each fraction was examined at 7X–30X magnification with a binocular microscope. Identified wood charcoal, nutshell, and seed and fruit remains were counted and the total weight or number of specimens for each sample was calculated.

Results

The sample of carbonized woods, nutshell, fruits, and seeds consists of 37 taxa, including four species represented by the nutshell, 22 species identified from the wood charcoal, and 17 species of seed and fruit remains. Provenience and quantification of plant tax categorized by habitat are presented in Appendices D, E, and F.

While certain plant species may occur within several habitats, the approach employed in the evaluation of carbonized plant macrofossils from Penitentiary Branch places each plant taxon in the context of the habitat with which it is most typically associated. Bar graphs of taxa categorized by habitat facilitate interpretation of exploitation strategies (Figure 15). Habitat requirements were derived from Radford et al. (1968) and Harrar and Harrar (1962). Plant genera represented by carbonized seeds and fruits are assigned to bottomlands, disturbed uplands, while cultivars and cultigens including taxa such as maygrass (*Phalaris caroliniana*) are placed in lower mesic terraces/bottomlands (Asch and Asch 1977, 1978; Cowan 1978; Harrar and Harrar 1962; Martin and Barkley 1961; Reed 1971).

Wood Charcoal

Approximately 27 percent of the wood charcoal specimens (*n*=1,545) is comprised of unidentifiable wood (see Appendix D). The greatest representations of taxa identified to genus or species are ash (*Fraxinum sp.*) at 19.3 percent, red and white oak (*Quercus spp.*) at 17.0 percent, honey-locust (*Gleditsia triacanthos*) at 7.8 percent, and hickory (*Carya spp.*) at 6.7 percent. Although taxon from bottomland, mesic upland, and xeric upland habitats were exploited, the most extensive exploitation was of genera from bottomlands (52.4 percent; *n*=559), and mesic uplands (31.5 percent; *n*=336). A relatively high species diversity (*n*=11) characterizes the bottomland habitat which was most extensively exploited. It is also noteworthy that few arboreal disturbance indicators (*n*=2) are represented and comprise merely 0.4 percent of the total or 0.7 percent of the sample identified to taxon.

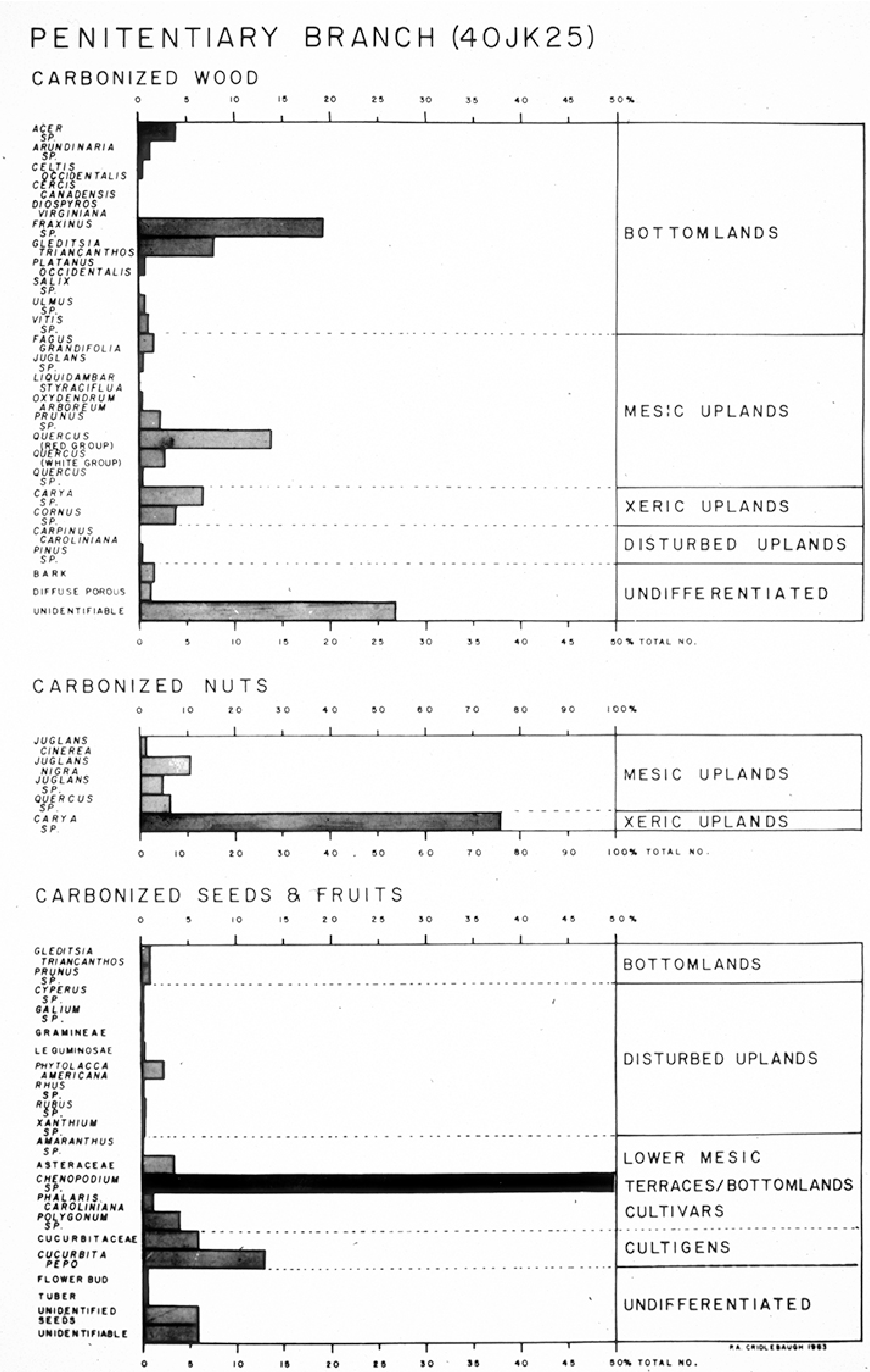

Figure 15. Percentages of carbonized wood, nutshell, seeds, fruits, and associated species habitats.

Carbonized Nutshell

Carbonized nutshell is tabulated by feature and habitat in Appendix E. Hickory nutshell (*Carya spp.*), which is most commonly associated with a mesic uplands habitat, represents 76 percent (40.091 g) of the sample The remaining 24 percent is derived from mesic upland walnut, including *Juglans cinerea* (1.4 percent; 0.743 g), *Julans nigra* (11.2 percent; 5.841 g), *Juglans spp.* (5 percent; 2.682 g), and acorn (6.4 percent; 12.607 g).[12]

Carbonized Seeds and Fruits

A total of 353 whole and fragmentary seed and fruit remains were recovered (see Appendix F). Eight-seven percent (*n*=307) were identifiable to genera or species. Of the identified specimens, 3.6 percent (*n*=11) are derived from arboreal and herbaceous bottomland taxa; 5.2 percent (*n*=45) are weedy herbaceous taxa characteristic of disturbed land. The greatest number of nonarboreal plant remains are representative of cultivars (*n*=176; 70 percent) and cultigens (*n*=65; 21.2 percent), and are derived from lower meric terrace/bottomland habitats. Goosefoot (*Chenopodium spp.*) represents 81.9 percent of the cultivars or 49.9 percent (*n*=176) of the total carbonized seed simple.

Squash (*Cucurbita pepo*) is the only cultigen recovered from Penitentiary Branch. The 65 fragments, comprising 21.2 percent of the identified seeds and fruits, were recovered from 17 features and three excavation unit levels. Four Cucurbit fragments were from Level 7, suggesting squash was associated with the Penitentiary Branch site occupation at least as early as 3375 BP.

Interpretation of Plant Exploitation

Plausible subsistence and economic potential of the nuts, seeds, fruits, and the plants they represent can be inferred from ethnographic sources and archaeological occurrence (Yanovski 1936; Yarnell 1974, 1976). Nutshell, seeds, and fruits are presumed to represent prehistoric food resources. That 91.2 percent of the identified seed and fruits remains from Penitentiary Branch are cultivars or cultigens supports this presumption. Wood was utilized for fuel, construction material, tools, and containers. The percentage of each genus within the above plant categories is assumed to reflect prehistoric utilization as well as the variables of deposition, preservation, recovery, and identification (Begler and Keatinge 1979; Ford 1979; Minnis 1981; Munson et al. 1971; Yarnell 1982).

The Archaic period inhabitants of Penitentiary Branch exploited plant taxa native to bottomlands, lower mesic terraces and uplands, xeric uplands, and disturbed habitats. Nutshell percentages in particular suggest xeric uplands were important for the procurement of hickory nut food. However, charred wood and both seed and fruit indicate that primary exploitation

[12] Weights in this section reflect recalculation of data tables; see Appendix E.

was of taxa occurring in bottomland and lower mesic terrace/upland habitats. The paleobotanical data and its application to specific habitats indicate that the Penitentiary Branch occupants procured plant material from bottomland, terrace, and upland habitats within the site locale. Primary exploitation of plant resources was within the immediate vicinity of the immediate occupation area along the lower river terraces. Exploited arboreal taxa are also indicative of an oak-hickory forest heavily interspersed with mixed mesic genera such as maple, ash, beech, and dogwood.

Despite the fact that Penitentiary Branch is the first Cumberland River site where squash has been recovered from a Late Archaic context,[13] perhaps the most significant information derived from the paleobotanical data pertains to the paucity of disturbance indicators. Only 0.7 percent of the wood charcoal and 5.2 percent of the carbonized seeds and fruits represent arboreal and nonarboreal taxa which commonly invade disturbed land. Less than 1 percent (*n*=5) of the wood charcoal is pine (*Pinus spp.*). The indication is therefore that within the vicinity of the Penitentiary Branch site prehistoric occupation and land use had not been sufficient to encourage the growth of secondary, disturbance species.

[13] An earlier *Cucurbita pepo* rind and seed were subsequently recovered along the Harpeth River from Middle Archaic levels at the Anderson site (40WM9)(Crites 1991:72).

IX. PALEOENVIRONMENTAL EXPLOITATION STRATEGIES: THE FAUNAL DATA

Emanuel Breitburg

The Penitentiary Branch site was situated within the upper reaches of the Nashville Basin and at the west base of the Eastern Highland Rim (Fennemen 1938). From 29–40 km to the east of the site is the escarpment of the Allegheny/Cumberland Plateaus. The site, moreover, was located within the tulip-deer-oak faciation at the southern terminus of the northern temperate deciduous biome (Shelford 1963:36). The rather unique location of the site and the recovery of over 27,000 bone and shell specimens therefore provide an excellent opportunity to examine the animal exploitative strategies of Late Archaic lowland/plateau hunter and foragers occupying a seasonal encampment along the Cumberland River. The density of cultural debris and the superimposition of features suggest that extensive procurement, consumption, and disposal activities were conducted at the site. These activities included stone, bone, and wood manufacture, plant and animal food processing, and mortuary activities.

In spite of impediments such as previous site destruction, the salvage nature of the excavations, and excavation/recovery problems (see Chapters I and III), a subassemblage of 10,600 vertebrate and 16,600 bivalve specimens were recovered from the unit levels and subsurface disturbances within a 378-m² excavation (Appendix G). Dr. Paul Parmalee, Department of Anthropology, University of Tennessee, provided assistance in identifying some of the faunal remains, while Patricia Coats of the Tennessee Division of Archaeology assisted in the tabulation of faunal remains from Penitentiary Branch. This material represents one of the most comprehensive collections of faunal remains from a Late Archaic site along the Cumberland River, and provides a comprehensive representation of the animal procurement and animal utilization activities at the site.[14]

Methods and Objectives

The methods employed to assess the faunal material involved the categorization of each specimen as identifiable or indeterminate mammal, bird, reptile, amphibian, fish, or bivalve. Each specimen was classified according to species, and if possible by element, anatomical position (i.e., left or right), and whether the specimen exhibited butchering cuts or modification. Notes pertaining to each species were recorded in a faunal inventory (on file, Tennessee Division of Archaeology) according to excavation unit, level, midden, and feature

[14] For recent examinations of Archaic faunal assemblages in the Cumberland River Valley, see Deter-Wolf 2013; Deter-Wolf and Moore (2015); and Peres et al. (2016)

affiliation. The inventory was employed to generate a table of the frequency of skeletal portions for each occupational level and by each identifiable taxon. The tables of frequencies for skeletal portions were employed to determine the minimum number of individuals (MNI) represented for each species and identified for each level. The number of fragments of identified species, indeterminate remains, and MNI associated with each level is summarized in Appendices G and H.

Analysis of the faunal remains was oriented toward identifying the animal species used by site occupants, assessing the skeletal composition of represented species, assessing the MNI of identified species, and calculating the potential meat yield of edible species. Additional objectives of the analysis involved establishing a model of butchering strategies of various utilized species, and establishing a model of bone implement manufacture and utilization. The most significant objective of the analysis was to evaluate subsistence variety and econiche breadth (Hardesty 1977:109–120). Subsistence variety or the number of resources to the inhabitants' subsistence economy provides a measure of adaptability of site occupants to local resources and surrounding environmental zones. Subsistence variety was examined from the standpoint of quantity (meat yield estimates and dietary ratios), temporal variety (seasonality of site occupation and the seasonal procurement strategies of site occupants), and spatial variety (the environmental zones exploited by site occupants and the importance of these zones to the subsistence economy).

Distribution of Faunal Remains

Archaeological investigations recovered more than 27,208 specimens of vertebrate and invertebrate remains. The analysis, however, was limited to a sample of 27,208 specimens. The distribution analysis of examined faunal remains was limited to the vertical (i.e., diachronic) distribution of the material. Vertebrate remains were primarily associated with Levels 1 through 4 deposits (80 percent [*n*=8,480]). The remaining specimens were derived from the first seven levels of occupation (Levels 11 through 5). Of the 10,600 vertebrate specimens, approximately one half were derived from feature context and the other half from midden deposits. Bivalve fragments account for 16,608 specimens, and about 80 percent (*n*=13,233) of this material was associated with the last four levels of occupation (Levels 4 through 1). Seventy percent or 11,577 specimens were recovered from two separate 1 x 1 m sampling units placed in a filled gully possibly used as a shell dump. These units were located adjacent to grid coordinates 131R231 and 136R233. No bivalve utilization is indicated for the first three levels of occupation (11 through 9). Although gastropods were recovered during site excavation, analysis of shell was limited to vertebrate and bivalve species only.

Based on fragment counts alone, the peak of site activity occurred between Levels 2 and 4. These levels account for 75 percent (*n*=20,481) of all remains. The frequency and concentration of the vertebrate and invertebrate remains suggests that site occupants initially were oriented toward the procurement of large vertebrates such as white-tailed deer, elk[15], black bear, and turkey. The large quantity of molluscan material implies that shellfishing eventually became a major activity at the site. Molluscan utilization, however, does not become prevalent until the eighth level of occupation and continues to increase in quantity until the fourth occupational level, after which there is a moderate decrease in recovered specimens. Based on the vertical distribution of the faunal remains, the period of greatest activity was documented for levels 2 through 4.

The vertical distribution of the remains implies that the site was initially a hunting camp for large game mammals and birds (i.e., turkey) and a later source of bivalves and gastropods. The absence of bivalves in the earliest levels of occupation suggests limited use, if any, of the phylum. The later appearance of large quantities of molluscan remains may possibly indicate a concomitant development of bivalve habitat at the confluence of the Cumberland River and Penitentiary Branch, and site processing activities that enriched the organic quality of adjacent aquatic habitats, allowing molluscan populations to thrive.

Species Composition

Classification and tabulation of the 27,200 specimens recovered during 6-mm and 12-mm waterscreen processing recorded a total of 75 orders, families, genera, and species (see Appendices G and H). Vertebrate remains account for 39 percent (*n*=10,600) of the material and were keyed to taxa in 3,488 cases (about 13 percent identifiable). A total of 19 mammal species representing 125 individuals were identified. These include white-tailed deer, the most frequently identified species with 2,540 specimens (9.3 percent of the total remains) representing 59 individuals. Other mammal remains were identified as human, elk, bobcat, bear, striped skunk, mink, raccoon, gray fox, domestic dog, gray wolf, porcupine, beaver, gray squirrel, woodchuck, chipmunk, rabbit, and opossum. The 246 fragments representing these species account for less than 1 percent of all remains.

Avian species are represented by five species and one genus. A total of 142 specimens (about 0.5 percent of all remains) were identified as raven, barred owl, turkey, red-tailed hawk, Cooper's hawk, and an indeterminate species of duck. A total of 20 individuals represent these species. Reptilian remains account for seven families, genera, and species of snakes and turtles. A total of 489 (1.8 percent) specimens represents 35 individuals identified as poisonous and non-poisonous snake families, eastern snapping turtle, possibly red-eared slider, painted or map turtle genera, eastern box turtle, snapping turtle, and spiny-softshell turtle. Amphibian remains are represented by 27 specimens and at least three individuals keyed to bullfrog and indeterminate frog and/or toad species. Piscine remains are represented by 44 specimens and

[15] Although elk are identified as comprising a significant portion of the faunal material from Penitentiary Branch, these animals are otherwise entirely absent from Archaic faunal assemblages in the Cumberland River Valley (see Deter-Wolf 2013; Deter-Wolf et al. 2004; Dowd 1989; Morse 1967; Peres et al. 2016). Pending reanalysis, the identification of elk in this context should be regarded skeptically.

18 individuals, and account for two families, two genera, and three species. Catfish remains were identifiable in 14 cases, drum in 11 cases, river redhorse or redhorse species in 13 cases, sucker family in three cases, and garfish in a single case.

Indeterminate vertebrate remains of mammals account for 6,481 specimens or about 24 percent of all recovered remains. Indeterminate bird remains represent 333 pieces (1.2 percent), and reptiles account for 224 specimens or less than 1 percent of all remains. Amphibian and fish remains were indeterminate in two and 72 cases, respectively.

Molluscan specimens were identifiable to species or genus in 16,608 cases. The bivalve material accounts for 61 percent of all observed remains and was keyed to one genus and 33 species (see Appendix H). Of the 16,600 recorded bivalves, representing 9,062 individuals, *Pleurobema spp.*, dromedary mussel (*Dromus dromas*), Mucker (*Actinonaias ligamentina carinata*), spike (*Elliptio dilatata*), and *Dysnomia spp.* account for 4,902 (10.5 percent), 2,857 (10.5 percent), 2,752 (10 percent), 2,680 (10 percent), and 2,465 (9.0 percent) specimens, respectively, of all examined molluscan remains.

Accounts of Species

Mammals

Zooarchaeologists who study prehistoric site faunal assemblages and subassemblages within the eastern deciduous forest have unquestionably demonstrated that the white-tailed deer was the single most important exploited species. The analysis of the recovered faunal remains from Penitentiary Branch continues to support this observation. Deer remains account for the most numerous identifiable remains and the greatest number of individuals. Among the 2,540 identifiable specimens, fetal, neonatal (newborn), juvenile, and adult remains account for 58 individuals. The MNI was determined independently for each level (see Appendix I). The elements employed to ascertain the MNI varied with the frequency of represented skeletal remains. The total MNI was determined by summing the MNI for each level. It is assumed that the presence of natural stratigraphy and the absence of intrusion from succeeding levels of occupation justify using this approach to determine the MNI.

The skeletal composition of deer remains demonstrates that antler and cranial remains account for 27.4 percent (*n*=695) of the material, while postcranial remains of the vertebral column and thoracic region, forequarter, hindquarter, undifferentiated metapodial remains, and undifferentiated phalangeal and sesamoid fragments respectively account for 10.3 percent (*n*=261); 17.8 percent (*n*=451); 27.3 percent (*n*=694); 6.5 percent (*n*=165); and 9.2 percent (*n*=233). Approximately 7 percent of the remains display cut marks (*n*=184) and about 7 percent (*n*=174) exhibit modification resulting from implement manufacturing procedures or tool use.

Exclusive of white-tailed deer and human remains, all other identified mammal species were sparsely represented among the levels of occupation. The remaining identified mammals listed in Appendices G and H account for 209 specimens. These specimens represent 8.0, 2.0, and less than 1 percent of all mammal remains, all vertebrate remains, and all remains, respectively. Although most of the species are common to the region both in prehistoric and historic times, porcupine is a notable exception.

The recovery of two portions of porcupine maxilla from Level 3 and a left calcaneum from Level 4 provides the first known record of the species in Jackson County. Evidence of the species occurring in the southern United States was reported by Parmalee (1963:267–268) and Parmalee and Guilday (1966:81–82), who reported the species as present in Pleistocene cave deposits in Tennessee and Late Archaic/Early Woodland deposits in Tennessee and Alabama. Hall and Kelson (1959) listed the eastern half of Tennessee as the most southern distribution of the species, but no living specimens had been recorded for the state. Parmalee has suggested that the species was probably never common and was exterminated by Indigenous inhabitants in marginal areas of its range. The other alternative is that the species was present during European settlement of the region and logging and agricultural activities may have contributed to their extirpation from the area.

Birds

Of the five species and one genus of identified avian remains, turkey was most commonly represented by both MNI and number of represented specimens. The species was associated with all levels of occupation. Of the 142 bird fragments, turkey remains account for 136 pieces. Duck species are represented by a single fragment, a coracoids, recovered from Level 1. Two species of hawk, red-tailed hawk and Cooper's hawk, were identified in Levels 1 and 2, respectively. Both species are represented by tarsometatarsi. A left femur shaft recovered from Level 1 was identified as barred owl. The most unusual species identified as the raven. A left distal carpometacarpal was recovered from Level 4. The species more commonly frequents the southern Appalachian mountains today and prefers high cliffs or well-shaded crevices as nesting sites.

Reptiles

Of the 489 specimens identified to the reptile class, 393 specimens (80 percent) represent the eastern box turtle. The species was identified as present in all levels of occupation. Specimens of spiny-softshell turtle (n=49) were recovered from all levels of occupation except Levels 7 and 11. Thirty-one fragments of turtles of the map and/or painted turtle genera were recovered from Levels 2 and 3. Snapping turtle is represented by a single modified costal fragment recovered from Level 2. Vertebrae of poisonous snakes and nonpoisonous snakes were recovered from Levels 3 through 5 and Level 11.

Amphibians

The only identifiable species of the amphibian class was bullfrog. The identified specimens were associated with Levels 2 through 4. Other amphibian remains identified as frog and/or toad genera were recorded for Levels 2 and 4. A total of 21 of the 27 recorded specimens were classified as frog and/or toad genera, while the other six specimens represented bullfrog.

Fishes

Forty-four specimens of identifiable fish were recovered from Levels 2 through 8. Drum, catfish, suckers, and gar are represented by cranial elements. Suckers prefer deep and swift waters running over gravelly riffles of small and medium-sized rivers. They are intolerant of silt and turbid waters. Drum prefer turbid waters over a bottom of mixed sand and silt. Adults feed on mollusk. Catfish are most abundant in clear fast-flowing water with a bottom composed of sand and gravel in medium and large rivers. The presence of the species suggests that site inhabitants procured fish in several different types of aquatic zones.

Bivalves

Of the 33 species of identified bivalves (Appendices G and H), dromedary mussel, Mucker, spike, *Pleurobema cordatum pyramidatum*, and *Dysnomis propinqua/sulcata* were the most commonly identified species. These species account for a little more than one half of the examined invertebrates. Almost all the species recorded in the sample are considered riverine species and are common in larger river systems. Almost all identified species may be found in water depths ranging from 30 cm to 91 cm, and most prefer a strong current and a substrate composition of gravel or gravel and sand. It is likely that the represented species were recovered from a single habitat which was probably located near the site. The large quantity of bivalves associated with the deposits suggest that shellfishing was a major activity at the site. The most likely period of collections would have been during the summer and fall when river depths are low, facilitating access to shellfish beds.

Butchering Strategies

Only a single species, white-tailed deer, provides a large enough sample to discern the methods employed during the butchering of animals. Judging from the frequency of the recovered deer remains, the entire carcass of the animal was processed at the site for hides, meat, and bone. Specimens bearing marks indicative of butchering procedures or hide removal appeal on examples of three cranial and mandibular remains and 181 postcranial remains. The marks may be easily discerned as incised lines at strategic points of the skeleton to remove skin and flesh and to disarticulate the carcass into smaller portions for distribution. Cut marks were located on a drawing of a deer skeleton (Figure 16) to determine the areas treated during the butchering process.

Cranial and mandibular remains displaying cut marks consist of an occipital portion, a calvarium of a doe recovered from Feature 94, and a portion of a ramus. The recovered doe calvarium exhibits a series of cuts on parietal bones, frontal bones, and at the site of the nuchal attachment of the occipital protuberance (cut no. 1).[16] Marks appearing on the occipital portion were observed along the medial aspect of the condyle. The mandibular specimen exhibits a cut along the lateral aspect of the ascending ramus (cut no. 3). These cuts suggest that the head was defleshed and/or skinned. Marks appearing on the occipital portion indicate that the head was removed by treating the ligament attachments at the occipital condyle, while the doe calvarium indicates that further treatment or alternative treatment of the nuchal attachment was also practiced to detach the head from the carcass.

The observation of postcranial remains demonstrates that the carcass was cut into portions at a number of different points and stripped of meat. Eighteen specimens of atlas (*n*=4), axis (*n*=6), other cervical (*n*=1), thoracic (*n*=2), and lumbar (*n*=1) vertebrate and ribs (*n*=4) bear evidence of butchering procedures relating to the treatment of the neck, back, and rib cage.

Observations of atlas vertebrae indicate that the ventral, dorsal, and lateral aspects of the element were treated (cut nos. 2, 4, and 5). Cuts appearing in these areas imply the lateral ligaments of the atlanto-occipital ligament were severed to release the head at the parmastoid processes and the funicular part of the nuchal ligament was cut to release the head at the dorsal aspect of the neck. Cuts appearing along the ventral aspect also aided the head removal procedure. Another alternative point to release the head from the neck involved treatment of the axis vertebra. Cuts appear along the dorsal and lateral aspects of the four examined axis vertebrae. These cuts suggest that the ventral atlanto-axial ligament and dorsal interspinous ligament were alternative or collateral methods of head removal (cut nos. 6 and 7). Treatment of the cervical vertebrae is evident in a single case (cut no. 8). The element exhibits a cut across the base of the dorsal spine. This possibly indicates that the spinous ligament was cut and also implies that the neck was separated from the rest of the carcass or sectioned into smaller pieces.

Specimens bearing cuts on thoracic elements indicate that both thoracic vertebrae and ribs were treated during the butchering process (cut nos. 20, 21, 22). Cuts appearing along the thoracic spinous process in two cases suggest that the back may been defleshed, while an element with a cut along the ventral aspect of the body may indicate that the vertebral column was sectioned into smaller pieces for removal of the thoracic viscera. In three cases cut marks on the lateral aspect of rib shafts and along the proximal aspect of one specimen suggests that the sides of the thoracic cage were defleshed and the ribs disarticulated at the proximal aspect.

Evidence of butchering appears on one example of a lumbar vertebra. The specimen exhibits a cut along the ventral aspect of the body, implying that the abdominal viscera were removed (cut no. 23).

[16] All cut mark numbers refer to Figure 16.

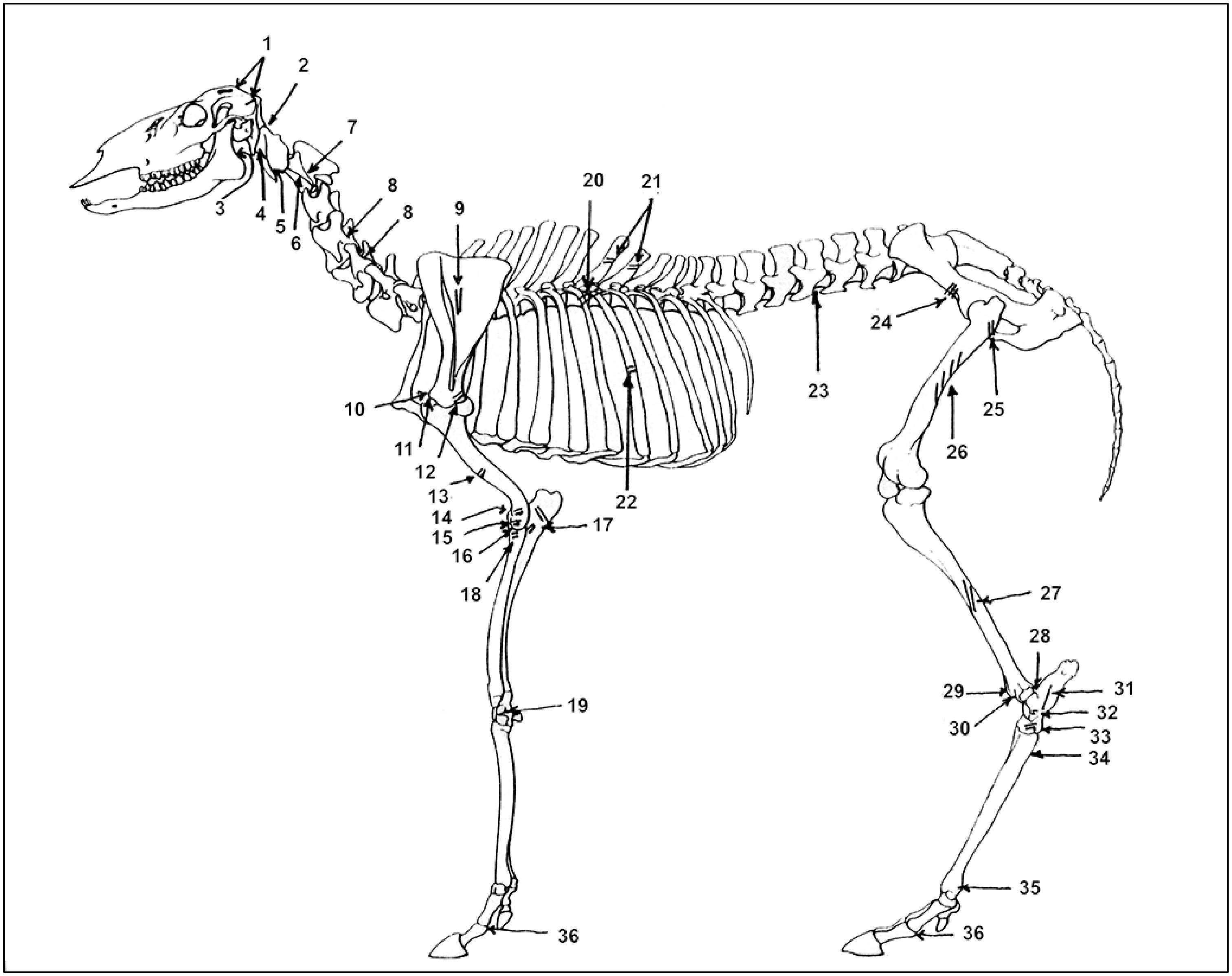

Figure 16. Locations of cut marks on deer bones.

Forequarter remains of the scapula, humerus, radius, ulna, carpus, metacarpus, and phalanges exhibit marks in 82 cases. Cuts appearing on scapulae suggest that the element was treated along the dorsal and ventral aspects of the blade, the neck, within the region of the glenoid rim and its respective tubercle. Many of the specimens exhibit a variety of these cuts. The cuts imply that the scapula as defleshed (cut no. 9) and separated at the distal aspect by treating the ligament attachments (cut nos. 10, 11, and 12). Twenty-five specimens of humeri exhibit cuts along the deltoid crest (cut no. 13), cuts across the anterior fossa of the distal aspect (cut no. 16), and cuts at the medial and lateral epicondyles (cut nos. 14 and 15). These cuts suggest that the element was separated from the forequarter by cutting the origins and insertions of muscles and ligaments at the anterior, medial, and lateral aspects.

Twenty-six specimens of radius elements exhibit cuts along the anterior, medial, and lateral aspects, below the proximal articular rim. These cuts indicate that site occupants separated the element from the forequarter by treating the long medial ligaments, and the insertion of the biceps brachii and brachialis muscles (cut no. 18). Collateral treatment appears on 12 specimens of ulnae. Cuts were observed along both the lateral and medial aspects of the proximal extremity (cut no. 17). These cuts sever the lateral and medial ligaments of the elbow. All of the cuts relating to the distal aspect of the humerus and proximal aspects of the radius and ulna serve to separate the forequarter at the elbow. In ten cases cuts were observed along the proximal extremity of the metacarpus. The cuts, appearing along the medial and lateral aspects, serve to remove the low part of the limb (cut no 19). Finally, cuts observed on undifferentiated phalanx fragments suggest that first and second phalanges were, on occasion, cut along the ventral aspect (cut no.6). These cuts indicate that the phalanges were removed by severing ligaments at the ventral and proximal aspects.

Hindquarter elements exhibit cuts on pelvic, femoral, tibial, tarsal, metatarsal, and phalangeal remains in 80 cases. In two cases cuts appear along the depression for the rectus femoris tendon (cut no. 24) and in two cases cuts appear along the ischial fragments. These cuts imply that the hindquarter was released from the carcass by cutting the tendon of the rectus femoris in some cases. The cuts appearing along the ischial specimens may suggest that the hindquarter was also released by treating the origins of muscles and ligaments. Femoral elements exhibit cuts in three cases (cut nos. 25 and 26). The knife cuts run along the entire anterior and posterior sides of the shaft, indicating the element was defleshed. Ten tibial elements display cuts along the shaft (cut no. 27). As in the case of femoral specimens, tibial specimens also indicate that the shaft was stripped of meat. Cuts also appear along the medial malleolus of the distal extremity of nearly all of the tibial specimens. These cuts indicate that the medial ligaments that articulate the ankle were cut to separate the lower leg from the tarsal complex (cut nos. 29 and 30). Central and fourth tarsal (n=2), astragali (n=30), and calcanea (n=26) indicate that the ankle was also treated along the anterior, medial, lateral, and posterior aspects to sever short and long ligaments to release the lower leg from the metatarsus (cut nos. 28, 31, 32, and 33). Eight specimens of metatarsi exhibit cuts along the proximal and distal extremities (cut nos. 34 and 35). Both points of treatment release the element as a single unit.

In summary, the observation of 184 elements bearing cuts suggests that deer were treated to remove the hide, deflesh elements, and disarticulate the carcass. The portions that were derived from the butchering procedures include the head, sections of the neck, the thoracic body; shoulder, upper arm, lower arm, and pes of the forequarter, while the hindquarter yielded portions composed of the rump, thigh, lower leg, and pes. In all, 11 portions were obtained from a single carcass for distribution.

Modified Bone

In addition to providing meat, mammals, birds, and reptiles were an important source of bone for the manufacture of implements and ornamental beads or charms and pendants. Deer bone was the most important source for the manufacture of awls, chert-working tools, hide-working tools, projectile points or awls and bone pins. A total of 174 specimens exhibiting modification represent tools or discarded manufacturing residue. Indeterminate large mammal long bone shafts were a source of awls and possibly fishhooks. Forty specimens were classified as deriving from large mammal bone. Other mammals that were a source of bone used for manufacturing purposes include the skull of gray wolf, the skull and long bones of gray fox, and the skull, jaw, and long bones of raccoon. Eleven pieces of manufacturing residue and finished pieces were identified to these species. Bird bone served as a material from which to make beads, awls, and other types of both utilitarian and nonutilitarian items. Turkey appears to be the most important source of bird bone used for manufacturing purposes. A total of 20 specimens exemplify the utility of bird bone. Finally, turtles were identified as an important source in the manufacture of cups, plates, or bowls. A total of 34 specimens indicate that box turtle was the primary species employed to make cups or bowls and soft-shell turtle, snapping turtle, and turtles of the map and/or painted genera were also used. The results of the analysis of modified bone are discussed below.

Modified Deer Bone

Upon completion or during the butchering procedure, elements of white-tailed deer were curated to manufacture utilitarian and non-utilitarian items. The sample of 174 modified deer bones exhibits modification indicative of manufacturing procedures or modification attributable to human race. Modified antler portions compose 41.8 percent (*n*=76) of 182 recorded specimens. Of the 261 vertebrae and ribs, two ribs exhibit modification. The sample of 451 forequarter remains contained 23 modified specimens (5.1 percent) and the sample of 694 hindquarter remains consists of 12 modified elements (1.7 percent). Undifferentiated metapodial fragments (*n*=165) were modified in 20 cases (12.1 percent). Of the 233 undifferentiated phalangeal and sesamoid remains, one specimen was modified. Finally, 41 modified specimens, although not attributable to species or element, probably represent deer bone also.

Antler was one of the most import elements of bone used to manufacture tools (Figure 17). Classification of the artifacts suggests that the material consists of manufacturing debris (*n*=26), long handled antler chert-working implements (*n*=9), two different-sized groups of antler tine chert-working implements (*n*=7 and 5, respectively), other miscellaneous chert-working implements (*n*=17), antler drifts or hammers (*n*=8), and one possible projectile point, one awl, one handle, and one carved cylindrical piece of antler.

Antler manufacturing debris (Figure 17d) demonstrates that the portions that were employed for manufacturing purposes were obtained by employing three techniques. The desired portions amenable for implement manufacture were obtained by scoring the outer layer of antler and around the circumference of the shaft in an even plane until trabecular bone was reached. At this point the portion was snapped or broken. This method of treatment appears on 15 of the 26 specimens of manufacturing debris. The number of scoring marks and the angles of incision varied from two to five lines. The second technique involved the application of a semi-circular incision that ended in a V-shaped cut that in some cases crossed and in other cases did not cross at the terminations of the strokes. At least three separate lines of scoring were employed. The first cut involved a semi-circular incision. The V-shaped incision was produced by beginning a line of incision at the respective ends of the termination of the semi-circular cut and creating the V-shaped pattern. At this point the desired section was probably snapped along the semi-circular cut. Eight specimens exhibit this method. The third method was uncommonly employed and two specimens exemplify the method. The method involved literally chopping and hacking the circumference of the shaft to separate the desired portion from the element.

Based on the size of observed specimens, a long-handled variety (*n*=9) and two groups of smaller flaking tools were distinguished (Figure 18 and Figure 19a and b). Four long-handled specimens were recovered in a complete state. The lengths range from 147.0–175.0 mm and the average is about 162.5 mm in length. All of the specimens retain some evidence of the initial stages of manufacture such as scoring, scraping striations, or breakage. The working ends of the implements either display concave working facets below the tip or display blunted and flattened working ends from extensive use of intentionally blunted for specific chert-working procedures.

The second group of antler chert-working tools (see Figure 19a and b) consists of two different-sized tools. The tools are identified as separate from other categories because they are complete (i.e., there is both a working end and scored base). The first group consists of seven specimens. They range from 34.0 mm to 46.8 in length. The average length is 41.3 mm (SD 4.8 mm). The average diameter of six specimens ranges from 10.0 mm to 13.0 mm, the mean being 11.2 mm (SD 1.2 mm). The second group consists of five specimens that range from 55.3–69.0 mm in length. The average length is 61.7 mm (SD 5.3 mm). The diameter of four specimens ranges from 12.0–7.5 mm and the average diameter is 14.4 mm. All of these specimens exhibit varying degrees of modification attributable to manufacturing procedures or human use. Finally, 17 miscellaneous fragments of tips or shaft portions of chert-working tools were also recorded.

Figure 17. White-tailed deer antler: a) Incised handle; b) Projectile point blank; c and d) Modified antler exhibiting butchering marks.

Figure 18. Long handled deer antler chert-working implements.

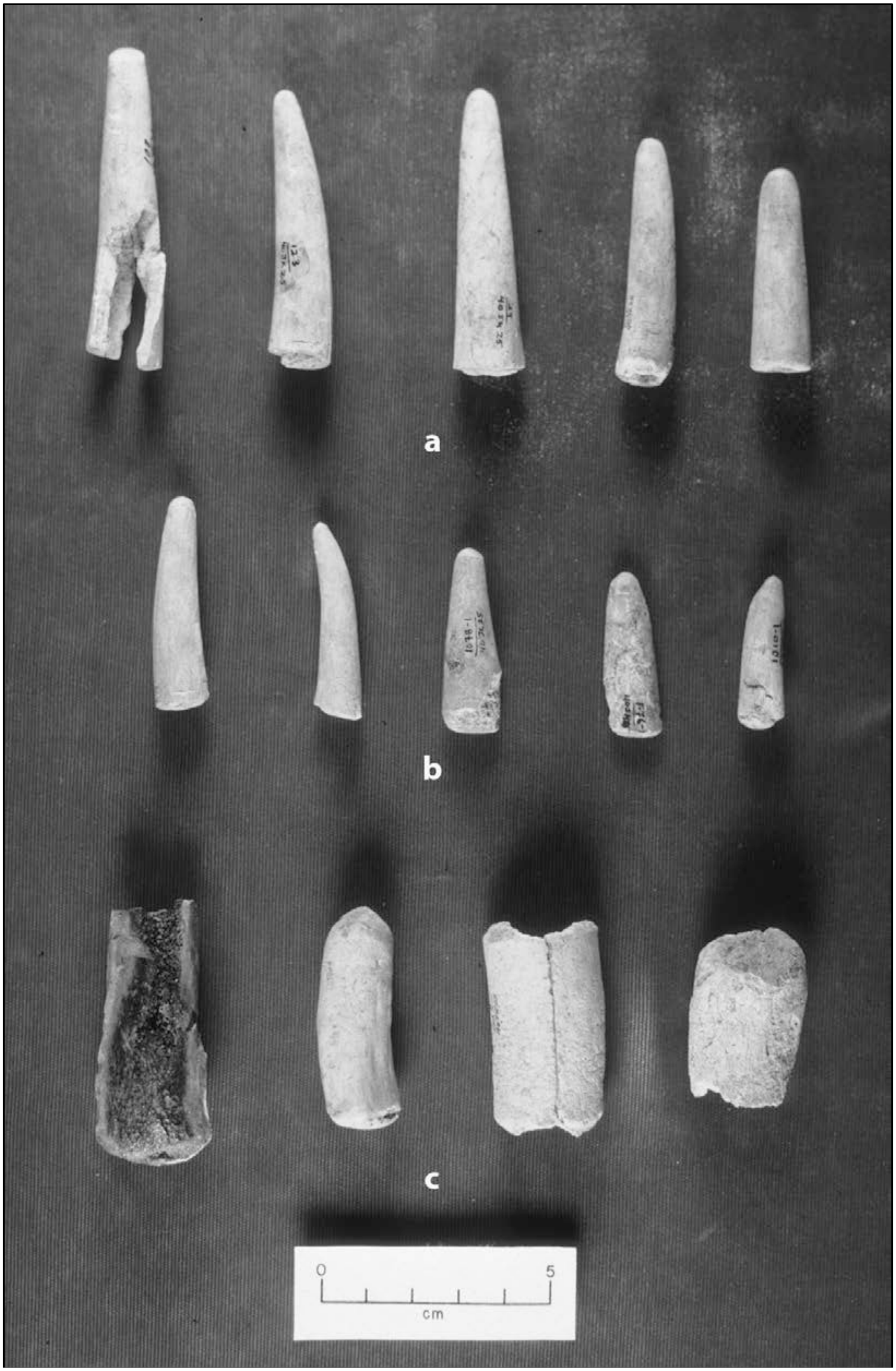

Figure 19. White-tailed deer: a-b. Antler tine chert-working implements; c. Modified beam sections (drifts).

In addition to the use of the tine and shaft tools, antler beams were also employed to make chert-working implements (see Figure 19c). Eight specimens include five artifacts that displayed heavily blunted end, and classified as drifts. Additional artifacts of antler consist of a complete antler handle. The specimen is complete and measures 11.2 cm in length (see Figures 17a and 20). A cross-hatched design was incised along each side of the handle and extensive polish is visible from use. The hafting element is 6.0 mm wide and 29.0 mm deep. The hafting element was produced by continuous longitudinal scoring. The specimen also displays a beveled end produced by scoring and breaking away the antler tine tip during the manufacturing process. The handle may have been used to haft a blade, point, or biface.

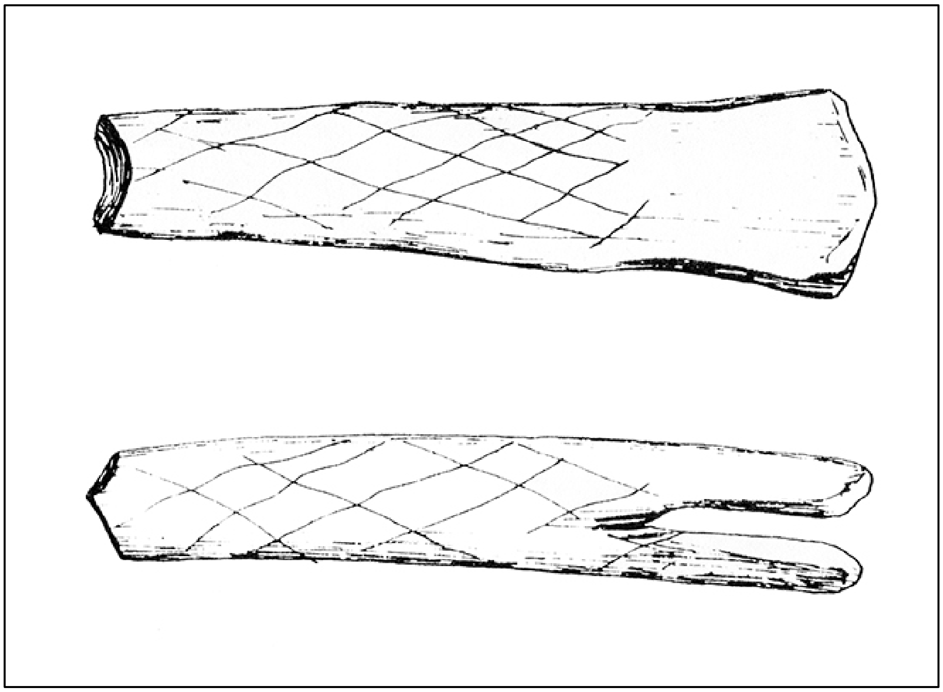

Figure 20. Drawing of incised white-tailed deer antler handle with incised pattern. Not to scale.

One possible antler projectile point was recovered from F-20 (see Figure 17b). The point was whittled from an antler tine for the entire length of the surface and a sharp point was fashioned at the end. There is no indication that the specimen was ever used and may have been discarded for some unknown reason. Additionally, an antler awl was identified from Level 5. The specimen exhibits a high degree of polish from use and numerous fine longitudinal striations.

Implements manufactured from forequarter elements include awls and end scrapers for working hides. These tools were fashioned from scapular and humeral elements, respectively. Specimens identified as awls and produced from the distal portions and blades of scapulae consist of 12 artifacts (Figure 21a). The awls were fashioned by modifying the blade into a handle and fashioning a point toward the distal extremity. The spine was incorporated within the main axis of the point and contributed to the structural durability of the implement.

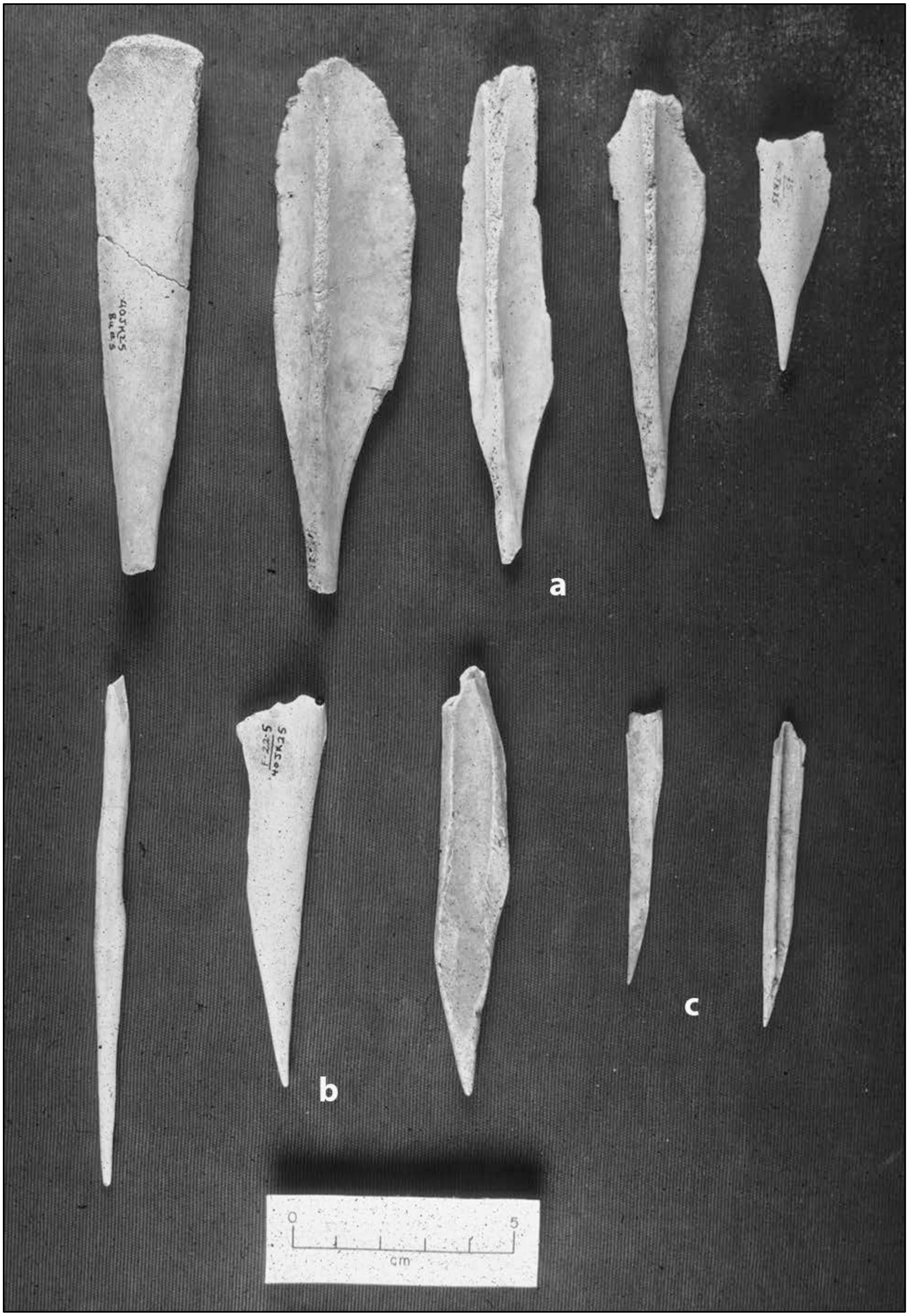

Figure 21. Awls: a. Modified scapula section awl, white-tailed deer; b. Splinter awl, mammal; c. Bird bone awl.

Five examples of bone end scrapers recovered from the site (Figure 22a and b; Figure 23) were fashioned from humeri. These include examples associated with Feature 21 (Level 4), distal portions recovered from units 133R230 and 133R230 (Level 4); and proximal portions recovered from Feature 33 (Level 2) and Feature 50 (Level 2). These tools are characterized best by the specimen recovered from Feature 21, which was made by scoring and breaking the proximal head of the humerus from the shaft perpendicular to the deltoid crest. The length of the resulting implement is 160.0 mm and it exhibits a very pronounced degree of polish from extensive use and handling. Modification of the implement is restricted primarily to the proximal area where the interior surface of the edge or rim was beveled by reaming processes to form a sharp edge. Beveling is apparent for 5.0 mm in the reamed area. Very fine striations define the working-edge of the implement.

Similar artifacts have been identified at Saltpeter Cave in Campbell County, Tennessee (Webb 1938:Plate 14b) and the Bluff Creek site west of Florence, Alabama (Webb and Dejarnette 1942: Plate 147). Webb and Baby (1957) concluded that these tools likely used to clean and dress hides. An additional report of these artifacts appears in Morse's dissertation (1967:Plate XXV, Fig. 2) on the Robinson site in nearby Smith County, Tennessee.

Although no additional implements may be specifically identified as being made from humeral elements, the recovery of two distal humeri which exhibit scoring and breakage suggests that the elements were used for other unknown purposes (see Figure 21d). Two modified ribs were recovered associated with Feature 35 (Figure 24b and c). One specimen represents manufacturing debris where the proximal aspect was scored and removed. The second specimen is a shaft fragment which exhibits abrasion of the anterior and posterior sides. Implements manufactured from ribs were not identified in the assemblage.

Modified postcranial remains such as femur, tibia, and phalanges appear to be uncommon to the sample of modified deer bones. One femoral portion (see Figure 21c) was identified as a possible hide-working tool. The specimen exhibits a highly polished cutting edge and shaft. One left tibia shaft fragment (Figure 25b) was fashioned into an awl. Finally, a fragment of a first phalanx (see Figure 24a) exhibits modification that included reaming the interior and perforating the distal articular surface. The specimen may be a dangle or related to a cup-and-pin gaming piece reported by Guilday (1963:159–163).

White-tailed deer metacarpi, metatarsi, and undifferentiated metapodial fragments indicate these elements were important sources of bone to make awls and bone pins. Manufacturing debris and awls manufactured from metacarpi and metatarsi consist of 32 specimens, while bone pins consists of 41 specimens. Manufacturing debris suggests that both bone pins and awls were made by scoring longitudinal sections from the posterior, medial, and lateral sides of metapodial shafts (Figure 26a and b).

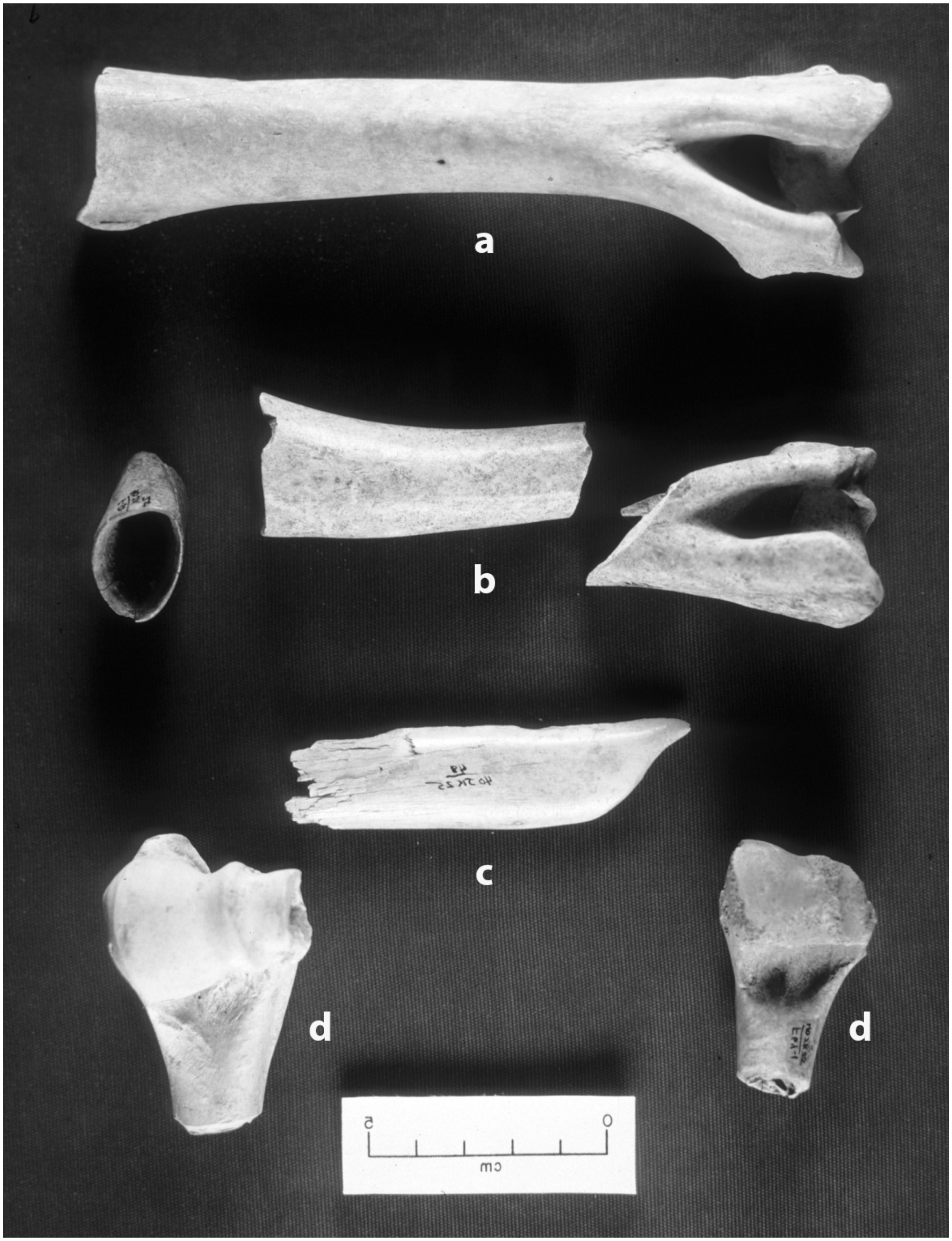

Figure 22. White-tailed deer humeri: a-b. End scraper or flensing implement; c. Beveled end scraper fragment; d. Modified humeri– groove and snap.

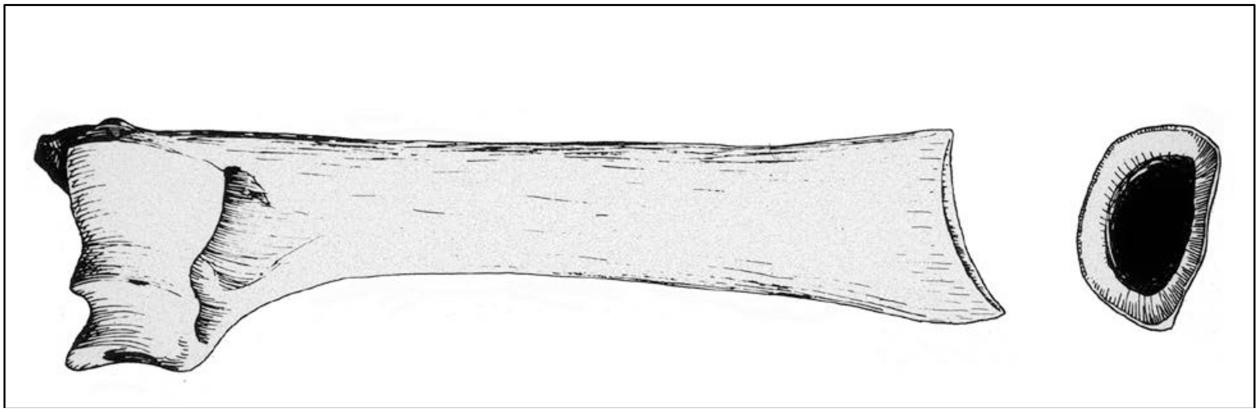

Figure 23. Line drawing of white-tailed deer humeri end scraper.

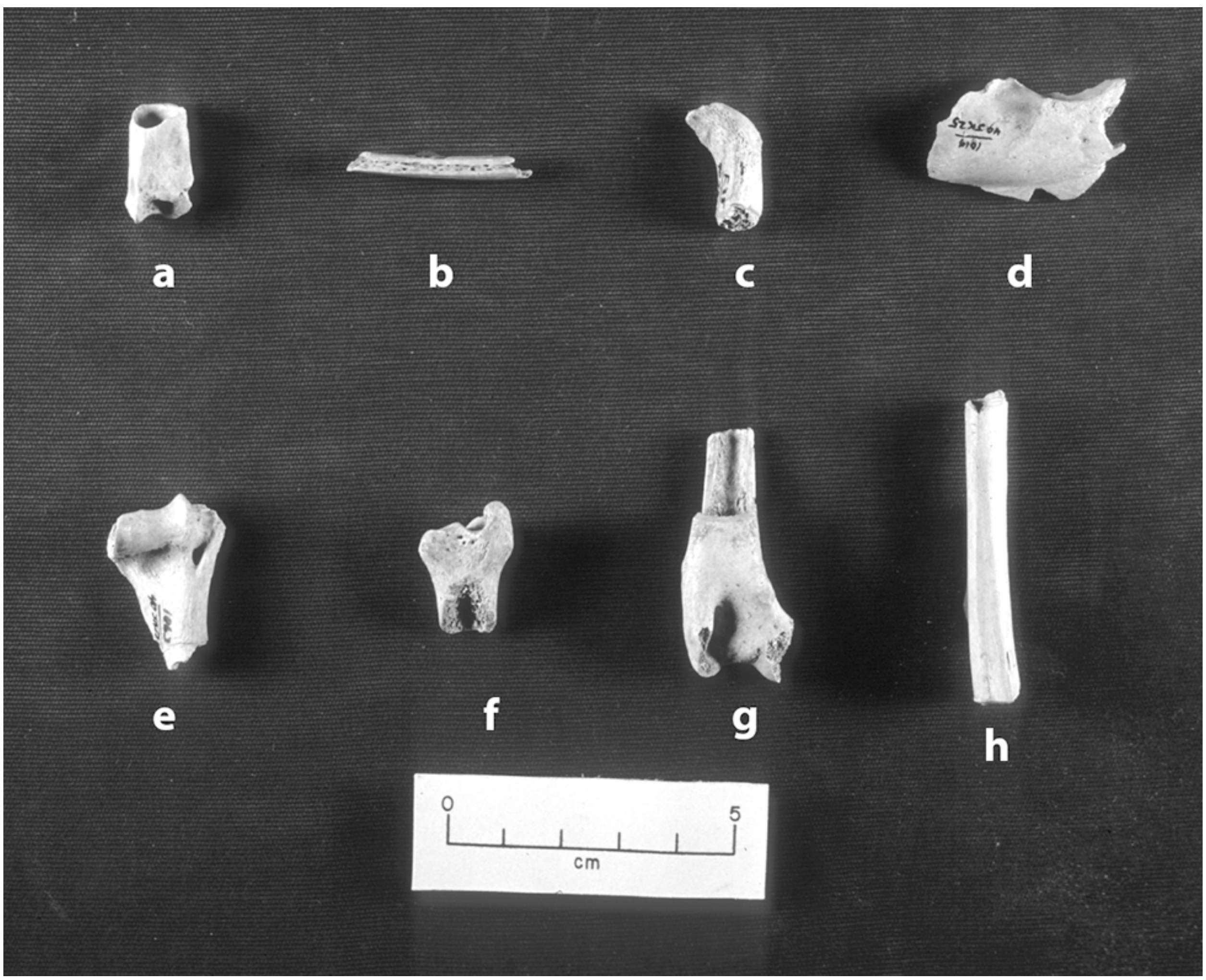

Figure 24. Modified bone: a. Phalange with drilled hole; b-c. Modified rib sections; d. Raccoon frontal with deep score marks; e. Raccoon humerus, scored and snapped; f-h. Modified raccoon bone.

Two awls fashioned from metacarpal portions measured 10.2 cm and 7.3 cm in length. Eight metatarsal portions consist of three pieces of manufacturing debris and four complete awls measuring 54.2 mm to 106.0 mm in length. Undifferentiated metapodial portions consist of three specimens of manufacturing debris and 12 complete awls ranging from 65.5–115.0 mm in length. Two specimens of metacarpals exhibit modified intertrochlear spaces (Figure 27a and b). The modification of the area is characterized by enlargement of the space and polished surfaces indicating that the implement held a dowel. The purpose of the tool is unknown. An additional specimen of a metacarpus (Figure 27c) exhibits an abraded posterior side for the entire length of the element; the element exhibits polish along the anterior side. The use of this specimen is unknown.

Undifferentiated metapodial portions indicate that bone pins were fashioned from the element in the same manner as awls. A total of 41 pieces were recovered. In some cases the heads of bone pins flared, in others they were round (Figure 26a-e, Row 1, 2, 3). Complete pins were recovered from Features 25 and 53 and measure 77.2 mm and 155.0 mm, respectively, in length. Some specimens exhibit lightly incised designs.

Indeterminate Modified Large Mammal Bone

Sixty-seven fragments of large mammals were classified as awls or components of awls (see Figure 21b). Two bipointed large mammal bones, possibly needles (see Figure 27b), measure 83.0 mm and 85.0 mm in length. Possible fishhook components (Figure 28c) were recovered from Features 8, 90, and 111. Nine miscellaneous fragments exhibiting polish, incised marks, or other modification were associated with deposits also.

Modified Gray Wolf, Gray Fox, and Raccoon Bone

Gray wolf was identified by the recovery of a cranial portion associated with Level 2, unit 133R230. The portion consists of the parietal and interparietal sections of the skull which were perforated or drilled through the interparietal bone. The diameter of the hole is 5.0 mm. The portion exhibits a high degree of polish and the posterior aspect of the section was truncated by abrading processes. The artifact may be a pendant or charm.

Gray fox bones were modified in three cases. Each specimen was classified as manufacturing debris. Feature 102 contained a frontal bone that exhibited fine scraping striations. Feature 17 contained a portion of a zygomatic arch that was scored and broken. The excavation unit adjacent to grid coordinates 136R230 (Level 1) contained a distal right humerus that was scored and broken 30.0 mm from the distal extremity.

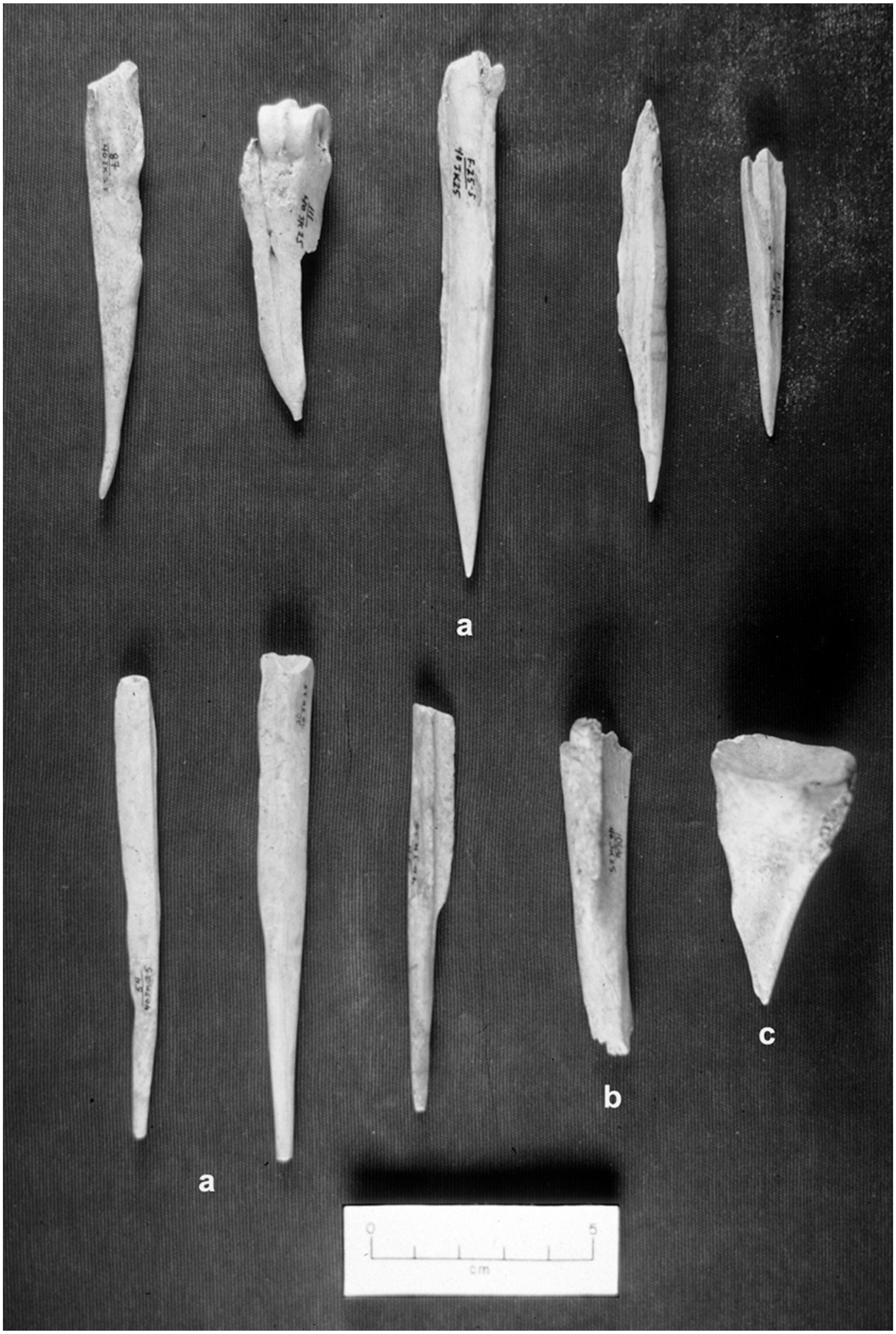

Figure 25. White-tailed deer awls: a. Metacarpal awls; b. Tibia awl; c. Scapula awl.

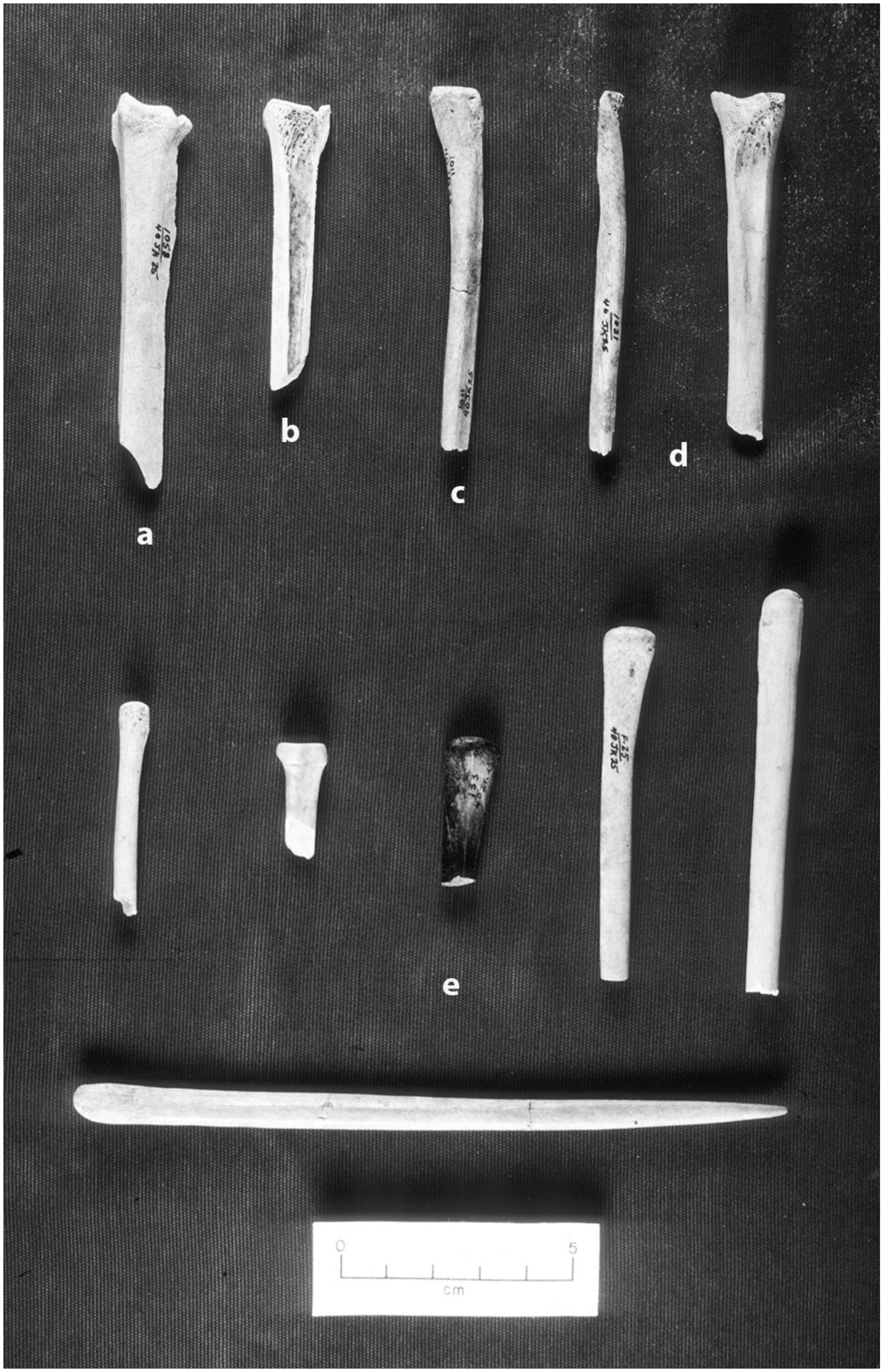

Figure 26. White-tailed deer metacarpi: a-b. Modified metapodial shafts, manufacturing stage; c-d. Manufacturing stage of bone pins; e. Metapodial and metacarpal bone pins.

Figure 27. White-tailed deer modified metacarpi: a-c. Modified metacarpal implements; d. Manufacturing debris.

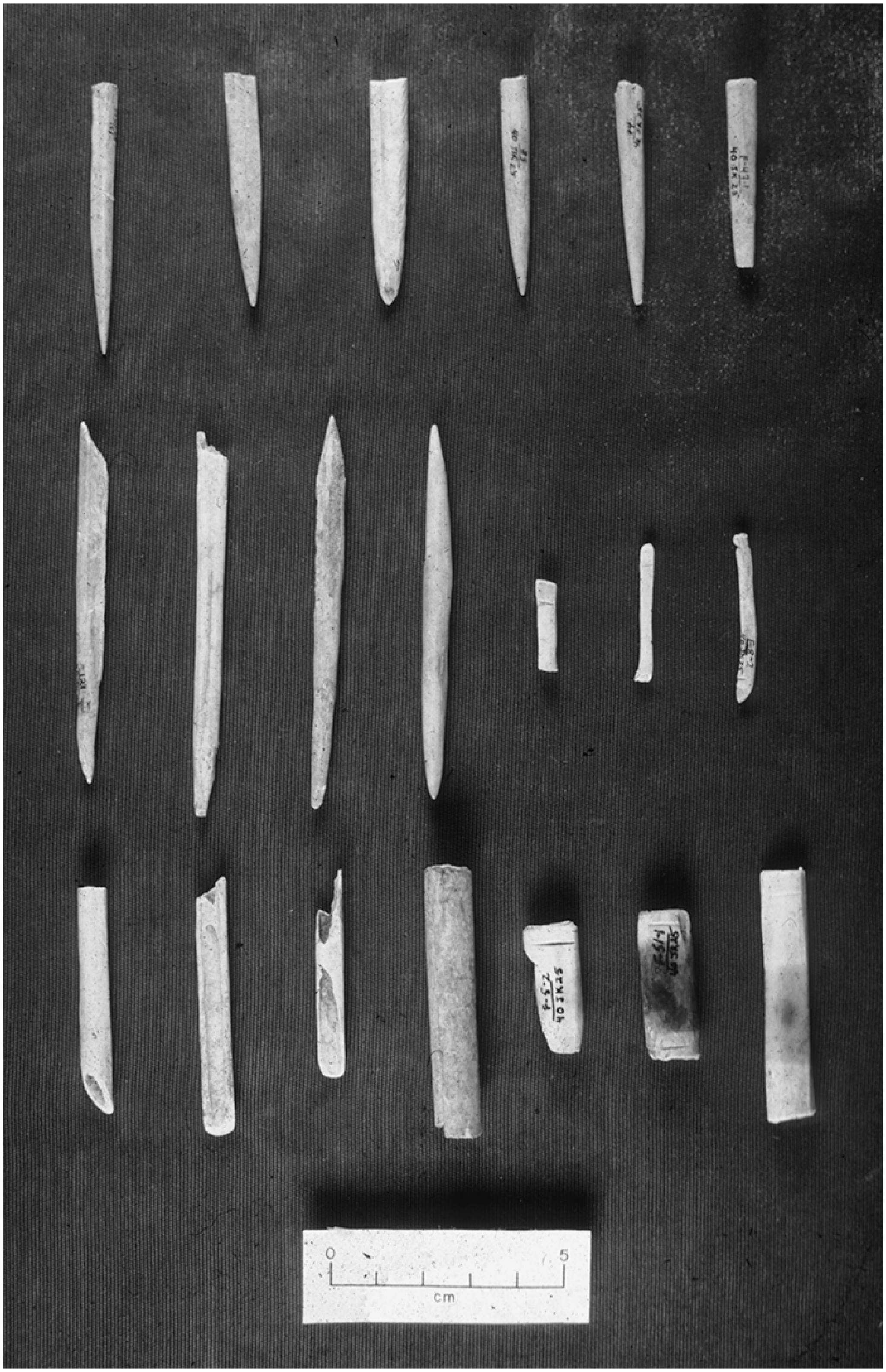

Figure 28. Bone implements: a. White-tailed deer metapodial bone pins; b. Large mammal bipointed needle; c. Fishhooks; d. Manufacturing process, bird bone; e. Turkey bone bead with long, deep score mark; f. Turkey bone beads, broken.

Seven modified specimens identified as raccoon elements represent manufacturing debris. Two frontal portions exhibit scoring marks and a right parietal bone exhibits polish from use or handling. A right ramus associated with Feature 100 was scored and broken between the third and fourth premolars. Three postcranial remains, exhibiting modification, consist of a left distal humerus which was scored and broken 25.0 mm above the distal extremity, a left distal tibia was scored and broken 23.0 mm above the medial malleolus, and a left proximal femur was scored and broken along the posterior and anterior aspects (see Figure 24e-g).

Modified Turkey Bones

Eight specimens identified as turkey bones were observed to be modified. Three specimens were identified as manufacturing residue. These include portions of a coracoid, tibiotarsus, and tarsometatarsus that exhibit scoring and breakage. The other five specimens were identified as turkey tibiotarsi and probably represent beads or portions of beads. The artifacts have been modified at both ends where the portion was scored and broken. In addition to these, two specimens exhibit scoring marks along the medial and lateral lengths of the bead. The beads measure 28.0–58.0 mm in length, with diameters from 10.0–12.0 mm. Three examples of beads appear in Figure 24f.

Modified Indeterminate Bird Bones

Bird bone was also employed to make awls and gouging tools. Four examples of awls range from 30.0– 72.0 mm in length. Five specimens represent some type of gouging tools (see Figure 28d). The specimens were modified by abrasion processes to form a cutting or gouging edge.

Modified Turtle Bone

Box turtle remains exhibit modification on 28 specimens of neural, costal, and plastral portions. Most of the fragments probably represent portions of bowls or cups. Carapaces were prepared as cups or bowls by removing the neural arches and scraping the area smooth. Seven specimens exhibit this process. Costal bones were scraped along the interior. Sixteen specimens exhibit this type of treatment. The cup or bowl was then formed by scoring along the marginal bones. At this point the marginal bones were broken away from the carapace, leaving a shallow bowl or cup. No complete specimens were recovered. Portions of bowls and manufacturing residue appear in Figure 29. Eastern snapping turtle carapaces were also amenable toward the manufacture of plates. A costal portion recovered from Feature 35 (Figure 29f) exhibits a smoothed interior and polished exterior.

Plates were also fashioned from soft-shell turtle carapaces. Only one specimen, recovered from Feature 14, exhibits modification. The fragment is a complete costal bone that exhibits smoothed interior and polished exterior surfaces. The rim of the element was tapered by abrading processes. A rocker-incised design is visible for the entire length of the interior surface. The specimen appears in Figure 29k and Figure 30.

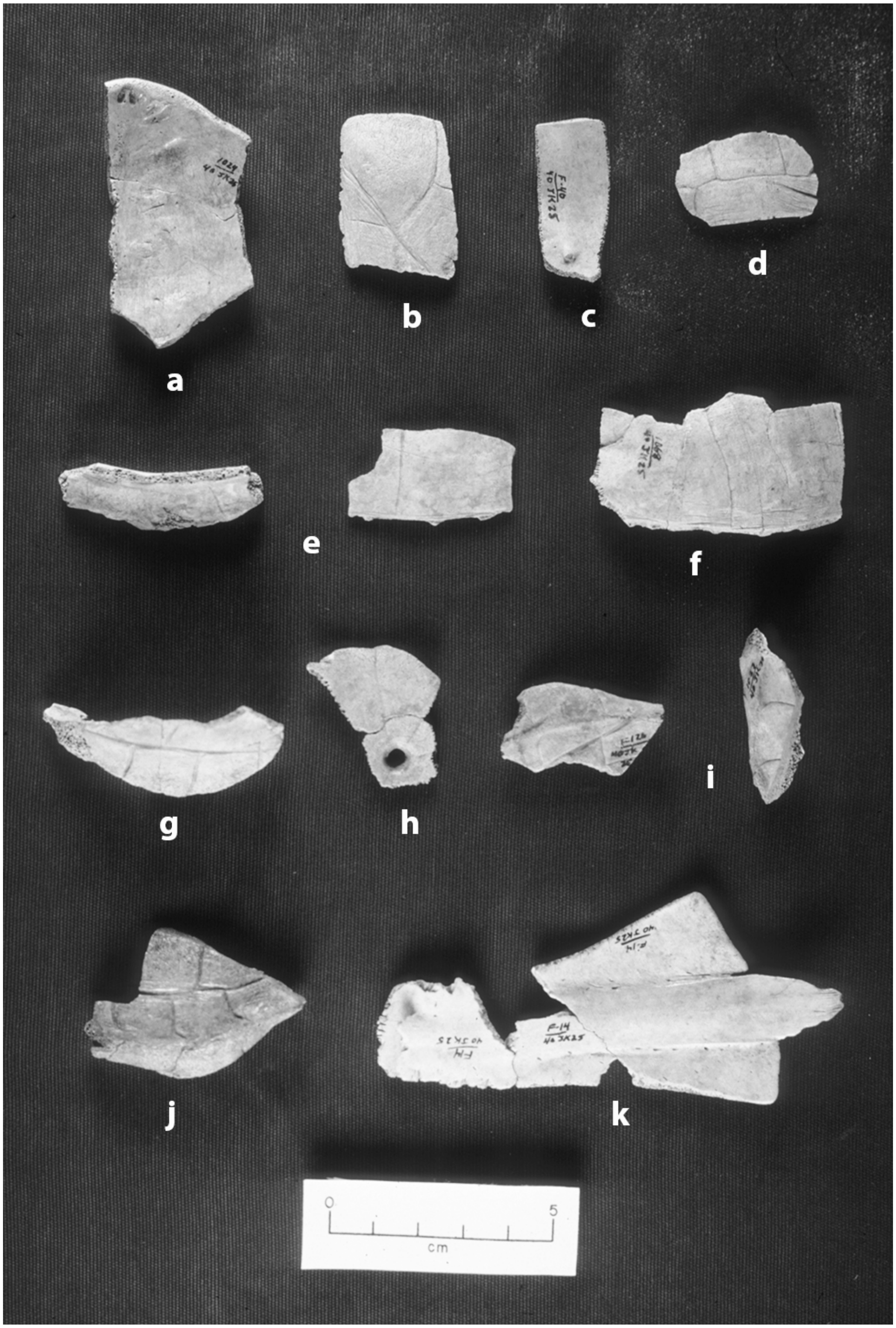

Figure 29. Box turtle, modified and manufacturing stages: a. Costal section with interior striations; b. Costal section, exterior scoring; c. Costal, smoothed interior; d. Costal worked rim and scoring marks; e-g. Costal, scored and snapped; h. Plastron, drilled hole; i–j. Manufacturing residue; k. Soft-shell turtle costal, incised.

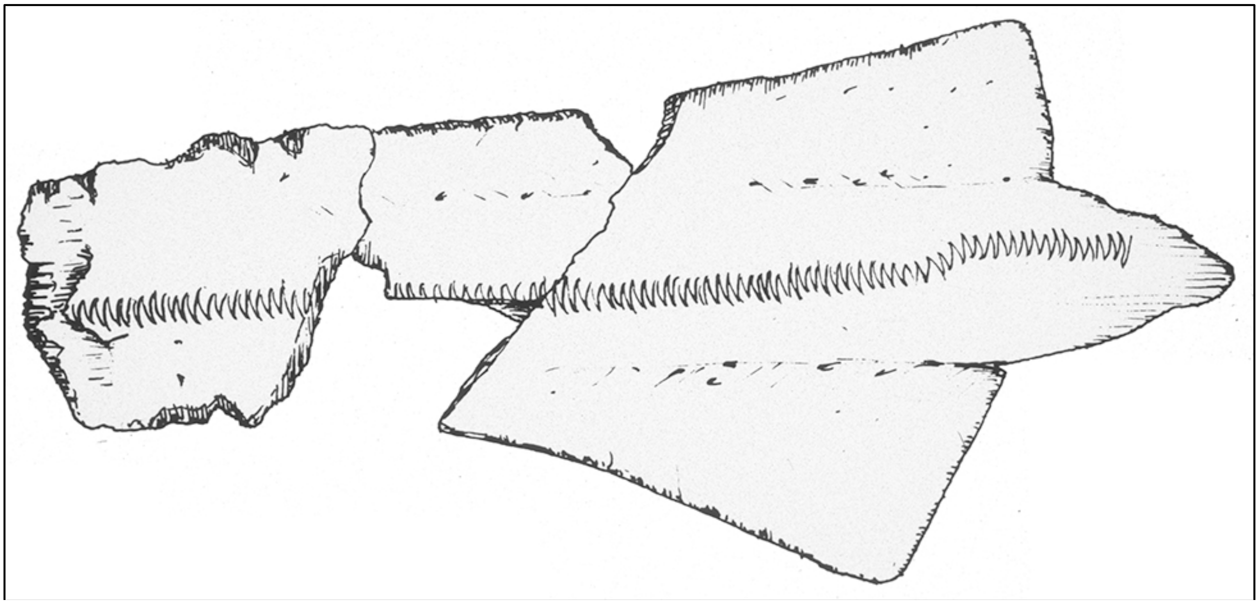

Figure 30. Line drawing of modified spiny soft-shell turtle, interior rocker incised.

Two map/painted turtle nuchal bones, one recovered from Feature 42 and one from unit 136R230 (Level 3), exhibit smoothing of the interior and exterior surface. Also recovered from unit 136R230 was a portion of a marginal bone that exhibits scraping striations on the interior and polish on the interior and exterior surfaces.

Subsistence Variety and Econiche Breadth

This section of the study examines the dietary importance of edible species to site occupants, the season(s) of site occupation and animal procurement, and the importance of exploited environmental zone to the subsistence economy. Two approaches were employed to generate the data necessary to evaluate diet, seasonality factors, and zones of exploitation. First, dietary ratios were determined for each edible species and for each level (Appendix J). This procedure involved determining the MNI for edible animal species and obtaining a live-weight estimate for each species. Employing White's (1953) method of determining useable meat estimates, the MNI and estimated kilograms of useable meat were multiplied to determine the total amount of useable meat per species or other taxa. Live-weight estimates for vertebrates were obtained from the literature presenting such data, while live-weight estimates for mussels were taken from Warren (1975:181). Following this procedure, the amount of useable meat for each species and class was summed and percentages were derived to create dietary ratios for intraclass (within the class/phylum) and interclass (between class/phylum) utilization.

The second approach was oriented toward defining subsistence variety and niche width (Hardesty 1977:120). Subsistence variety or the number of resources (in this case animal species) used for subsistence and how much each resource is depended upon may be used to define the breadth or width of the ecological niche. A single value is derived by taking the square root of all dietary ratios (i.e., percentages), summing the values, and dividing 100 percent by the summed values. The single value that is derived takes into account how many resources are employed and how much each resource contributes to subsistence. The greater the index value, the more evenly the resources contribute to the total subsistence. Likewise, a lower value would indicate more dependence upon a few resources and a more focal food economy. Derived indices may provide an idea of resource variety, spatial distribution of resources, and temporal distribution of resources.

The results of these procedures indicate that mammals were the primary source of meat to site occupants. Deer was the most important species taken and provided an estimated 51.3 percent of the meat, while elk and bear were significant sources of meat, providing an estimated 24.5 percent and 11.1 percent, respectively (see Appendix J). All other mammals (bobcat, skunk, mink, raccoon, gray fox, porcupine, beaver, gray squirrel, woodchuck, rabbit, and opossum) contributed about 6 percent of the meat. Birds (primarily turkey), reptiles, amphibians, fish, and mussels account for 2.3 percent, 0.3 percent, less than 0.1 percent, 0.6 percent, and 3.5 percent of meat utilization, respectively. These values represent an estimate of the entire site sample without regard to stratigraphic considerations. When the material is examined by stratigraphic representation (see Appendix J), there is some variation in the importance of species as meat contributors. For example, only 19.4 percent deer utilization is apparent in Level 11, while elk utilization is 77.2 percent. In another case, mussel utilization of Level 4 and Level 6 was about 11 percent, while all other levels suggest about 0.5 percent to about 3.4 percent mussel utilization. This variation may be attributed to either sampling error or to variability in resource acquisition, resource availability, or simply the hunter's luck in acquiring animal species through time.

The evaluation of resource variety from the standpoint of quantity indicates that the initial level of occupation was oriented toward pursuing elk and deer. Levels 10 and 9 indicate that site occupants strictly procured deer. In Level 8 deer, elk, and bear became the primary sources of meat. Level 7 occupation indicates that the procurement of deer and elk provided the bulk of the meat and there is no evidence of bear utilization. By Level 6 deer and other smaller mammals were the primary sources of meat. There is no evidence of elk or bear utilization. Level 5 deposits indicate that elk provided more meat than deer, and there is no evidence for bear utilization. Level 4 deposits indicate that deer was the most important meat contributor followed by bear. There is no evidence for elk utilization. Mussel utilization became more important and accounts for 11.6 percent of the meat utilization. Levels 3 and 4 deposits demonstrate that deer was the primary source of meat, while elk and bear were secondary sources. Other mammals, birds, reptiles, amphibians, fish, and mussels account or a small percentage of meat utilization.

Values derived to measure resource variety for 10 levels of occupation are: 1.5, 1.1, 1.1, 3.2, 2.2, 2.5, 3.1, 3.3, 2.5, and 2.8 for Levels 11 through 1 and 2, respectively. These values demonstrate that the quantity of meat derived from all resources was limited in the first three levels of occupation to one primary source meat (deer), while succeeding levels of occupation largely depended on three resources (deer, elk, and bear). The entire site sample indicates that these three species were the primary source of meat.

Temporal variety provides an ideal of how evenly the utilized resources are distribute during seasonal occupation of the site. Based on the presence of fetal and newborn deer remains, spring and summer occupations are indicated. The presence of deer antler and evidence for antler tool manufacture suggests that site occupation continued into the late fall. The presence of woodchuck remains suggests that occupants procured the species from May to late October when the species begins to hibernate. Warm-weather activities are indicated by the presence of reptile, amphibian, fish, and mussel remains. The absence of migratory birds argues against early winter and late winter occupation. The general evidence would suggest that site occupation was strictly geared to warm-weather occupation, lasting from May or June until late October or early November. There is little evidence to suggest that the site was occupied during the winter months. Such evidence would yield a value of 1.0 for temporal variety. This indicates that site occupation and seasonal procurement of animal resources are correlated. In other words, site occupants employed the area as a seasonal encampment.

Spatial variety provides an indication of the significance of exploited environmental zones to site occupants. The primary areas frequented to obtain animal species include forest margins to obtain such species as deer, elk, and turkey; woodlands to procure bear; and aquatic habitats to obtain aquatic mammals, fish, reptiles (i.e., turtles), and mussels. Forest edge was the most important area frequented, while woodland and aquatic zones, although exploited extensively, contributed little to the value of spatial variety. The values derived for spatial variety averaged about 1.5. This suggests that the food economy was largely based on the exploitation of a single zone, consisting of forest edges.

Conclusions

Zooarchaeological analysis of the faunal remains recovered from the Late Archaic Penitentiary Branch site focused on the examination of 27,208 specimens of bone and shell. A total of 75 orders, families, genera, and/or species, were identified from the sample. Deer was the most important animal resource utilized by site occupants to procure meat, hides, and bones. Elk and bear were found to be significant sources of meat also. Approximately 86 percent of the estimated value of meat utilization was attributed to deer, elk, and bear procurement. Although other vertebrates were taken (e.g., raccoon, beaver, and turkey), these species proved to be incidental to the food economy. Smaller mammals account for about 7.0 percent of the meat used, while birds, primarily turkey, accounted for 2.3 percent. Mussels, although gathered in large quantities, account for only about 3.5 percent of the meat contribution. Reptiles (turtles), amphibians, and fish were a minor source of meat.

The examination of the material from the standpoint of subsistence variety and econiche breadth indicates that the site was a seasonal encampment, occupied from early spring until late fall. Site occupants focused their hunting activities along forest margins to procure deer, elk, and turkey. Woodlands were a source of bear, while aquatic habitats were extensively exploited for aquatic mammals, turtles, fish, and mussels. However, aquatic habitat exploitation proved to be only supplemental source of meat.

X. LITHIC RAW MATERIAL RESOURCES AND IMPLEMENTS

Both chert and limestone were utilized by the Penitentiary Branch site occupants for the manufacture of chipped and ground stone implements. Chert types and source areas in the Nashville Basin and Eastern Highland Rim are virtually undescribed with the exception of specific research areas (cf. Faulkner and McCollough 1973; McCollough and Faulkner 1976). In addition, no geologic survey map has been prepared for the Penitentiary Branch locale, and no archaeological survey for the identification of prehistoric lithic quarry sites has been conducted in the site locality.

Generalized geologic data for the region indicates locally available lithic resources include the Catheys Formation, Chattanooga shale, the Fort Payne Formation, and St. Louis and Warsaw limestone (Hardeman et al. 1966). The Ordovician Catheys Formation, which commonly outcrops on hillsides, is comprised of blue-gray medium-grained argillaceous limestone and fine-grained, nodular argillaceous limestone (Hershey and Maher 1963:74). Chattanooga shale, a nearly black friable layered to tough, slaty, and bituminous shale, outcrops on low and mid-level slopes (Bassler 1932:137). This Devonian material underlies the Mississippian Fort Payne Formation, and is well preserved in the dissected hills and bluffs which form outliers of the Eastern Highland Rim into the Nashville Basin.

The locally abundant Fort Payne Formation is characterized by chert beds interbedded with coarsely crystalline pure limestone (Hershey and Maher 1963:78). Formation thickness ranges from 61 m to 91 m and underlies 3 m or greater of overburden. Chert color and purity are highly variable and silica content increases from south to north. Thick bedded, coarse-grained fossil fragmental St. Louis limestone is characterized by limited exposures as a consequence of a thick residuum of intermixed silt, clay, and fragmented chert (Hershey and Maher 1963:79–80). A thick residuum also covers Warsaw limestone, an interbedded coarse crystalline and fine- to medium- grained limestone.

Chert Resources

Fort Payne Chert

Fort Payne chert, a siliceous rock of impure chalcedony, was utilized predominantly in the Penitentiary Branch site manufacture of chipped stone implements. The Fort Payne chert classifications and descriptions devised by Faulkner and McCollough (1973; 1976) for the upper Duck River Valley proved to be an invaluable research tool for this analysis and were employed when feasible. Published descriptions (Faulkner and McCollough 1973; McCollough and Faulkner 1976) and reference collections at the University of Tennessee, Knoxville Department of Anthropology were used as aids in determining Penitentiary Branch lithic assemblage chert types. The highly variable color ranges of blues, grays, and tans as well the paucity of information regarding Fort Payne chert outcrops in the study area formed the criteria for subdividing the material into at least nine categories.

Blue-Gray Tan Chert: The outer cortex of this medium-grained to fine-grained silica material may be thin and smooth or thick and roughly pitted. The chert matrix ranges from light blue, blue-gray, and light gray to tan with some fossiliferous inclusions and faults. Specimens of this non-homogeneous chert may exhibit solid coloration or, most commonly, a mottled matrix with small light blue, gray, or tan silica inclusions.

Tan Porcelaneous Chert: A homogeneous tan slightly porous textured matrix characterizes this chert. In the upper Duck River Valley, Faulkner and McCollough (1973:53) found that tan-colored chert occurred in separate beds or in outcrops which graded into blue-gray and tan chert. Consequently, Penitentiary Branch site Tan Porcelaneous Chert is probably a product of similar bedding.

Blue-Gray Tan Fossiliferous Chert: This is a medium- to fine-grained chert with a matrix coloration identical to the light blue, blue-gray, light gray, and tan of Blue-Gray Tan Chert. The major variation in this fairly lustrous chert is the extensive amount of fossiliferous inclusions which are commonly oolitic.

Gray-Tan Mottled/Banded Chert: This slightly porous chert is assumed to be a variant of Blue-Gray Tan Chert. Irregular swirls or concentric bands of tan and gray colored silica comprise the matrix; the cortex is tan-colored and smooth or slightly irregular.

Light Gray Chert: The matrix of this medium- to fine-grained chert grades from light gray to light blue-gray. A relatively homogeneous chert, the matrix occasionally exhibits small fossiliferous inclusions or tiny light gray silica inclusions.

Tan-Gray-Green Chert: The matrix of this medium- to fine-grained chert displays a green cast. Small tan silica and fossiliferous inclusions occur within the non-homogeneous silica matrix.

Blue-Gray Banded Chert: A light blue-gray fine-grained matrix with concentric bands of darker gray define this Fort Payne chert.

Blue-Gray Oolitic Chert: Blue-Gray Oolitic chert is a fine-grained lustrous material with a dark blue coloration and light blue or gray oolitic inclusions which create a salt and pepper or speckled effect. The outer cortex is thin and smooth. While this chert is probably derived from the Fort Payne Formation, it possibly is not a variant of Blue-Gray Tan Chert since it is more fine-grained and lustrous as well as intensively oolitic and darker in color.

Dark Blue-Gray Tan Chert: This chert is characterized by a more fine-grained and lustrous texture than Blue-Gray Tan Chert. In addition, the coloration is very dark mottled blue and gray with darker colored silica and fossiliferous inclusions. The cortex is thin and smooth.

Possible Fort Payne Chert

Gray Chert: A homogeneous medium- to fine-grained gray chert with occasional small fossiliferous inclusions.

Dark Gray Chert: A homogeneous fine-grained and lustrous matrix characterizes this dark gray material. Outer cortex is typically thin and smooth. This chert may be a variant of Dark Blue-Gray Tan Chert.

Gray Banded Chert: This is a fine-grained slightly porous silica material which is characterized by a dark gray coloration with irregular darker bands. The occurrence of this type chert at the Penitentiary Branch site is rare. A similar gray banded chert was located in a massive outcrop in the Duck River area (Faulkner and McCollough 1973:54); such material may be a part of the Fort Payne Formation or transported to the Penitentiary Branch locality.

Non-Local Cherts

Origin of the following cherts is unknown; however, coloration and textural characteristics we well as rarity of occurrence at the Penitentiary Branch site suggests they are not derived from the Fort Payne Formation. As a consequence, they are designated as non-local.

Black Chert: This material is a medium-grained homogeneous silica with black coloration.

Blue-Green Chert: This is a deep blue-green chert with a fine-grained and slightly vitreous texture. Artifacts and debitage of this material are extremely rare at the Penitentiary Branch site. Nodules of blue-green chert are derived from the St. Louis limestone at the interface of the Cumberland Plateau escarpment and Highland Rim (Faulkner and McCollough 1973:56).

Jasper: Jasper is a fine-grained chert with a reddish-brown coloration. Artifacts of this silica material are rare at the Penitentiary Branch site.

Indeterminate Chert

This is waterworn chert which simply cannot be identified due to the worn outer surface; consequently, it may be of local or non-local derivation.

Vein Quartz

Vein quartz is a dense medium-grained white quartz which rarely occurs at the Penitentiary Branch site. It may be water transported or outcrop on steep slopes in the area.

Chalcedony

This is a silica material characterized by a colorless to pale gray color with a waxy and translucent appearance.

Agate

This material is a variegated quartz which occurs in white and amber colors. It is similar to chalcedony in its waxy and somewhat vitreous texture. Artifacts and several nodules were recovered from the Penitentiary Branch site suggesting it may occur within near proximity to the site.

Other Lithic Materials

Limestone

Limestone outcrops on the hillsides in the immediate vicinity of the Penitentiary Branch site and is a locally abundant lithic material utilized prehistorically for cooking/hearth stones as well as in the manufacture of implements such as axes and hoes. This argillaceous and nodular material may be derived from the Cathys, St. Louis, and Warsaw Formations.

Shale

Chattanooga shale commonly outcrops in the study area. Fragments of black shale 24 mm or less in diameter comprised a large percentage of the site midden matrix. Larger and less friable pieces of shale were used in the manufacture of flaked and ground artifacts.

Sandstone

Sandstone is available but not locally abundant in the study area. This fine-grained rock was used as cooking/hearth stones, abraders, and pitted cobbles.

Chipped Stone Implements and Debitage

The observation of systemic variables in the analysis of lithic implements and debitage recovered from excavations at Penitentiary Branch was aimed at ordering the assemblage and determination of technology and function. Implements have been functionally assigned on the basis of specific definitive morphological and use-wear attributes; however, this analysis attempts to avoid typological assignments. The artifact categorization is flexible and simply categorizes implements with similar attributes. Artifacts, particularly projectile points/knives, are defined on this basis and reference to named cultural types is provided as a comparative aid.

Primary recorded attributes of the assemblage included raw material, manufacturing technique, and specific morphological and metric attributes. Vernier calipers were used to obtain measurements for the total implement (including hafting element) length, width, and thickness, as well as the stem/haft length, width, and thickness. Factors governing variability of metric attributes may be a product of raw material and/or functional processes such as resharpening. All bifacial and unifacial implements from features and excavation unit levels were analyzed and classified into the following categories: cores, blanks, performs, projectile points/knives, knives, scrapers, drills, perforators, denticulates, notched flakes, gravers, chisels, adzes, chipped stone digging implements, blades, and utilized flakes (see Appendix G). Lithic debitage from all features was analyzed. Select metric attributes for lithic implements are presented by category in Appendix K.

Cores (*n*=66)

Unprepared nuclei of cobbles, nodules, and tabular raw material and large, thick bifacial reduction flakes characterize cores recovered from the Penitentiary Branch site (Figure 31a). The 66 cores or core fragments are amorphous, subconical, discoidal, or blade cores with two or more flake scars. Most cores display one or two striking platforms and flake removal is uni-directional, bi-directional, or multi-directional.

Raw Material: Blue-Gray Tan (40; 2 Heat), Blue-Gray Tan Fossiliferous (2), Blue Gray Oolitic (2) Dark Blue-Gray Tan (11), Mottled Gray-Tan (2), Light Gray (2), Gray (1), Dark Gray (1), Gray Banded (1), Black (3), Agate (1)

Form: Amorphous 39 (59. percent), Subconical 21 (31.8 percent), Discoidal 5 (7.6 percent), Blade 1 (1.5 percent)

Core Rejuvenation Flakes (*n*=7)

These artifacts comprise the exhausted platform of a core removed as a flat or tabular flake. Raw material types include Blue-Gray Tan (6) and Gray (1) chert.

Chipped Stone Blanks

Penitentiary Branch site lithic artifacts classified as blanks were assigned to the blank manufacturing stage in the lithic assemblage on the basis of these characteristics which indicated a roughly shaped and blocked out artifact in the early stage of manufacture (Wormington 1957:274) exhibiting bifacial flake removals and elementary shape. Blanks were separated into five stages of manufacture ranging from most preliminary forms to well-shaped and thinned forms which suggest final implement shape. A total of 142 specimens were classified as blanks.

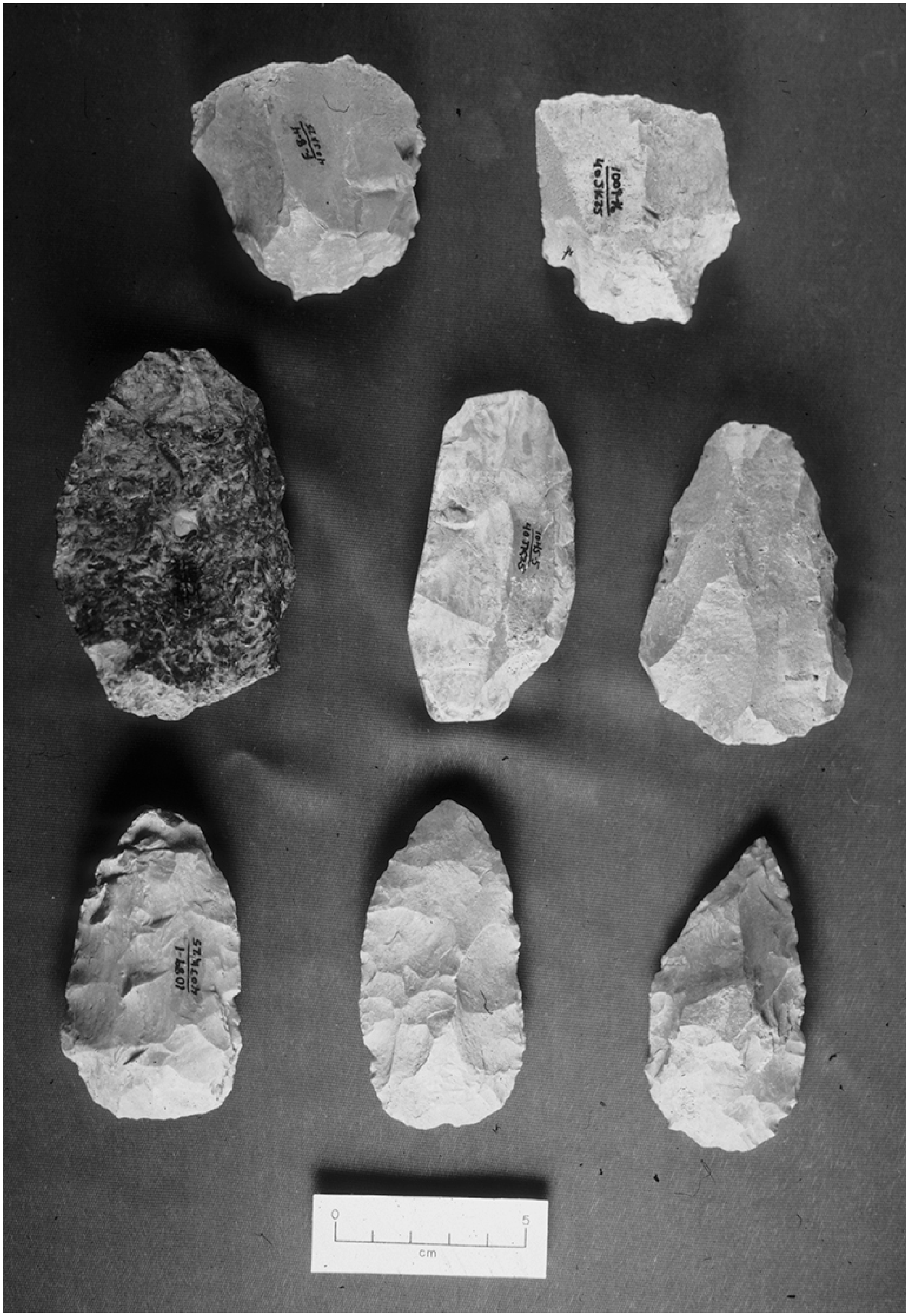

Figure 31. Chipped stone implements: a. Cores; b. Blank, Stage 1; c. Blank, Stage 2; d. Blank, Stage 3; e. Blank, Stage 4.

Blank Stage 1 (*n*=34)

These partially bifacially flaked stone artifacts were manufactured on a cobbles or thick flakes, and were amorphous to roughly ovate or elongate in shape (Figure 31b). They were manufactured through direct percussion removal of large flakes from portions or all ventral and dorsal surfaces, were rarely completely bifacially reduced, and occasionally unifacial. They exhibit extensive cortex, with hinge and step fractures commonly terminating in large knots. The lateral edges are distinguished by large flake scars terminating in highly irregular (zig-zag) edges. Peripheral shaping of individual specimens is typically incomplete.

Raw Material: Blue-Gray tan (22; 1 Heat), Blue-Gray Tan Fossiliferous (1), Blue-Gray Oolitic (3), Gray Tan Mottled/Banded (1), Dark Blue-Gray Tan (1), Gray Banded (3), Black (1), Agate (1), Quartz (1)

Blank Stage 2 (*n*=49)

These roughed out wholly to partially bifacially flaked lithic artifacts were manufactured on cobbles or thick flakes and reduced to suggest an oval or rectangular shape (Figure 31c). They were crudely ovate or elongate rectangular and manufactured through direct percussion removal of large flakes from the majority of the ventral and dorsal surfaces. Some cortex is retained, and these artifacts exhibit hinge and step fractures terminating in large knots. The lateral edges are acute but irregular and produced by large bifacial flake removals. Peripheral shaping is relatively complete, while proximal and distal ends are typically indeterminate.

Raw Material: Blue-Gray Tan (32), Blue-Gray Tan Fossiliferous (1), Dark Blue-Gray Tan (3), Blue-Gray Oolitic (3), Gray-Tan Mottled (1), Gray Banded (1), Gray (2), Dark Gray (3), Tan-Gray-Green (1), Agate (2)

Blank Stage 3 (*n*=39)

These roughed out bifacially flaked lithic artifacts were manufactured on a cobble or flake and reduced to suggest an ovate, triangular, or rectangular shape (Figure 31d). Manufacture involved direct percussion removal of numerous medium-sized flaked from ventral and dorsal surfaces, leaving hinge and step fractures terminating in knots. A small percentage of specimens still retain small patches of cortex. The lateral edges are relatively parallel, and peripheral shaping is relatively complete, with proximal and distal ends determinate.

Raw Material: Blue-Gray Tan (19), Blue-Gray Tan Fossiliferous (2), Blue-Gray Oolitic (3), Dark Blue-Gray Tan (5), Gray-Tan Mottled (1), light Gray (1), Dark Gray (1), Black (1), Gran Banded (2), Tan-Gray–Green (1), Agate (1), Limestone (2)

Blank Stage 4 (*n*=17)

These bifacially flaked lithic artifacts were reduced to suggest an ovate, triangular, or rectangular form, and appreciably thinned in contrast to previous stages of blank preparation (Figure 31e). Manufacture took place through direct percussion of medium to small flakes, leaving cortex in minor quantities on some specimens. Hinge and step fractures were present, with knotting less pronounced in comparison to previous stages of manufacture. The acute edge perimeters were straight, and edge preparation consisting of grinding was present on some specimens

Raw Materials: blue-Gray Tan (8), Tan Porcelaneous (1), Dark Blue-Gray Tan (2), Light Gray (1), Dark Gray (1), Black (2), Gray Banded (2)

Blank Stage 5 (*n*=3)

A thinned and shaped bifacial artifact theoretically requiring no further reduction prior to flake removals necessary for production of some type of lithic implement. These artifacts represent transitional Blanks/Preforms.

Raw Materials: Blue-Gray Tan (2), Dark Blue-Gray Tan (1)

Blank Fragments (*n*=70)

Roughly flaked bifacial fragments with large flake removals were classified as blank fragments since they lacked formalized flake removal more characteristic of performs or completed bifaces.

Raw Material: Blue-Gray Tan (45), Blue-Gray Fossiliferous (2), Blue-Gray Oolitic (2), Dark Blue-Gray Tan (12), Tan-Gray-Green (1), Gray Banded (3), Dark Gray (1), Black (2), Agate (1), Jasper (1)

Discussion

While some Penitentiary Branch blanks were probably manufactured on large core reduction flakes, they are primarily the product of bifacial removals from an unprepared nodule or block. Factors supportive of this suggested predominant form include the following: Stage 1–5 blanks lack evidence of a flake striking platform; blank form is massive and biconvex in cross-section; a total of 26.1 percent (*n*=37) of blanks retain cortex and/or fracture planes on two or more faces, while 69.7 percent (*n*=99) blanks exhibit cortex/fracture planes on one or more faces.

Cortex and fracture planes are also indicative of blank stage. Cortex on one or more faces is present on 91.2 percent (*n*=31) of the Stage 1 blanks; 77.6 percent (*n*=38) of Stage 2;

48.7 percent (*n*=19) of Stage 3; and 52.9 percent (*n*=9) of Stage 4 blanks. All remaining specimens retain no cortex or fracture planes.

<u>Chipped Stone Preforms</u>

Preforms, which follow blanks in the Penitentiary Branch lithic reduction sequence, have been defined by Crabtree (1972:85) as follows: "Preforming denotes the first shaping. Preform is an unfinished, unused form of the proposed artifact. It is larger than, and without the refinement of, the completed tool. It is thick, with bulbar scars, has irregular edges, and no means of hafting."

Preforms described below do not precisely correspond with Crabtree's definition. Penitentiary Branch performs are generally larger, slightly thicker, and less refined than the completed implement. They do not necessarily represent the first shaping and tend to have regular lateral edges. Preforms are primarily characterized by the lack of hafting elements on bifacially flaked shaped pieces. A total of 198 specimens were classified as performs and assigned to one of three preform stages.

Preform Stage 1 (*n*=41)

These bifacially thinned and shaped artifacts exhibit an amorphous oval to triangular shape but lack refinement of completed implements (Figure 32a). Blade edges are parallel or expanded, while lateral edges may be slightly irregular or regular. The basal area is generally triangular or rounded. These artifacts were manufactured through direct percussion, and commonly exhibit large knotting due to raw material and incomplete thinning. Little cortex remains on Stage 1 preforms.

Raw Material: Blue-Gray Tan (23; Heat 2), Blue-Gray Tan Fossiliferous (1; 1 Heat), Blue-Gray Oolitic (2), Dark Blue-Gray Tan (2), Tan Porcelaneous (3), Gray-Tan Mottled (1), Blue-Gray Banded (1), Tan-Gray-Green (2), Light Gray (1), Dark Gray (2), Black (2), Agate (1)

Preform Stage 2 (*n*=64)

Bifacially thinned and triangular, tear-drop, or rectangular shaped artifacts which exhibit slightly more refinement than Stage 1 preforms (Figure 32b). The edges are parallel or expanded, and lateral edges are regular with fine percussion flake removals. The basal areas are triangular and straight or rounded. These artifacts were manufactured through direct percussion, followed by pressure flaking along lateral edges of some specimens. The ventral and dorsal surfaces were thinned and exhibit little cortex.

Raw Material: Blue-Gray Tan (28; Heat 4), Blue-Gray Tan Fossiliferous (7; Heat 1), Blue-Gray Oolitic (1), Tan Porcelaneous (2), Dark Blue-Gray Tan (6), Blue-Gray Banded (1), Tan-Gray-Green (4; 1 Heat), Light Gray (3; Heat 1), Gray (2), Dark Gray (4), Black (1; Heat 1), Gray Banded (3), Agate (1), Indeterminate Water Worn (1)

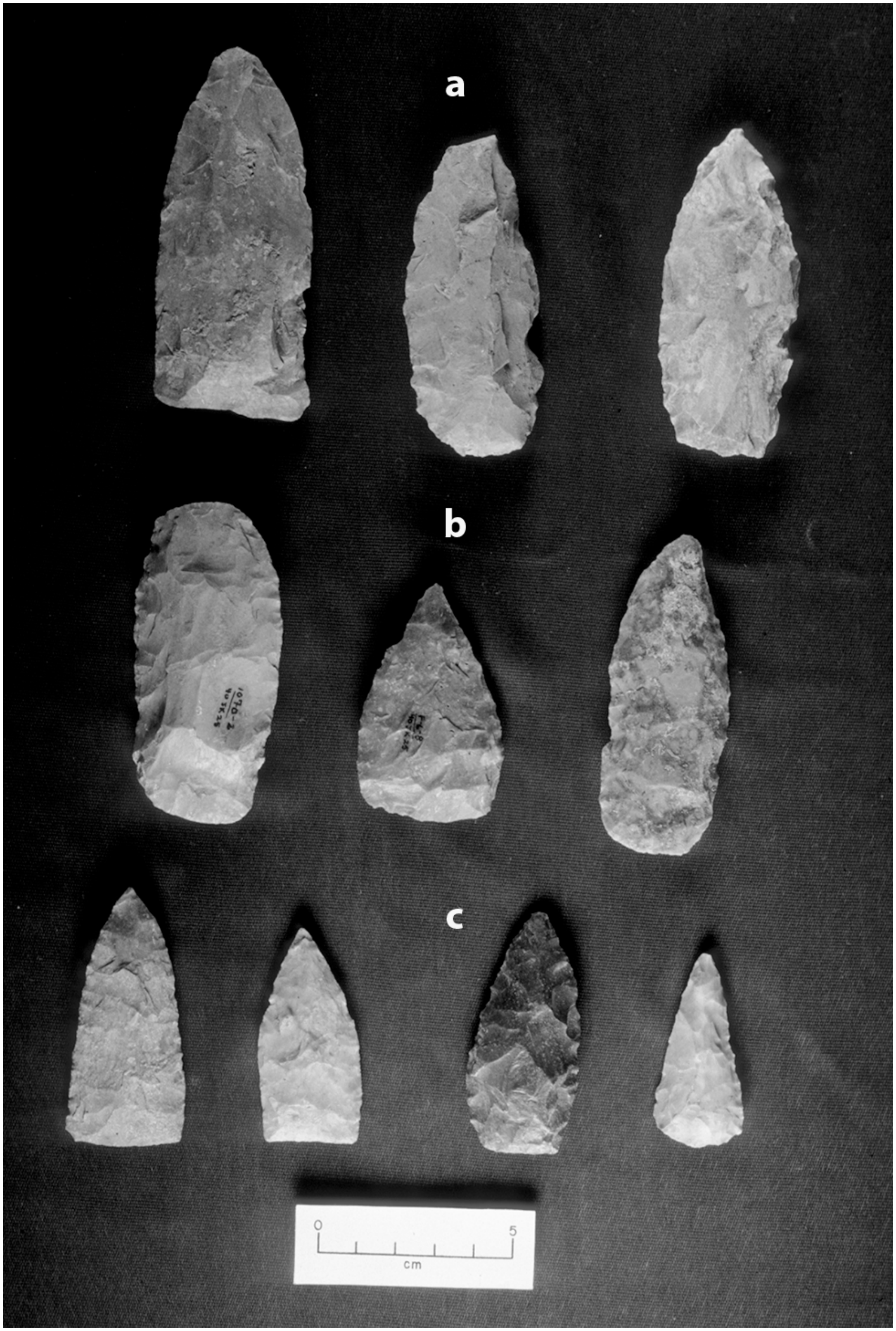

Figure 32. Preforms: a. Preform, Stage 1; b. Preform, Stage 2; c. Preform, Stage 3.

Preform Stage 3 (*n*=93)

Thinned and shaped bifaces which are well finished and lack only hafting modifications in order to be classified as completed implements (Figure 32c). Their shapes are primarily triangular, with some specimens of tear-drop and pentagonal forms. Blade edges are expanded triangular or parallel, with lateral edges well finished via intermittent pressure flaking and grinding. The basal area is well thinned and shaped and may be expanded triangular with straight base, occasionally incurvate or excurvate, or rounded.

Raw Material: Blue-Gray Tan (39; Heat 6), Blue-Gray Tan Fossiliferous (3; Heat 2), Blue-Gray Oolitic (3), Gray Tan Mottled (7; Heat 1), Dark Blue-Gray Tan (7; Heat 1), Tan Porcelaneous (6; Heat 2), Blue-Gray Banded (2; Heat 1), Tan-Gray-Green (2), Light Gray (2; Heat 1), Gray (6; Heat 2), Dark Gray (3), Black (2; Heat 1), Blue-Green (3; Heat 1), Chalcedony (2), Agate (1), Quartzite (1), Gray Banded (4)

Preform Fragments (*n*=137)

Bifacial fragments characterized by medium to slightly smaller flake scars and less refined shaping than that typical of completed implements were placed within this category. All proximal fragments are those of performs; however, medial and distal fragments are less diagnostic and a small percentage may be blanks.

Sample Size (Proximal): 36

Raw Material: Blue-Gray Tan (18; 1 Heat), Blue-Gray Tan Fossiliferous (1), Dark Blue-Gray Tan (3), Blue-Gray-Green (2), Tan Porcelaneous (2), Light Gray (2), Gray (2), Gray-Tan Mottled (3), Black (1), Jasper (1), Agate (1)

Sample Size (Medial): 27

Raw Material: Blue-Gray Tan (18), Dark Blue-Gray Tan (4), Blue-Gray Tan Fossiliferous (1), Blue-Gray Oolitic (1), Blue-Gray Banded (1), Gray Banded (1), Black (1)

Sample Size (Distal): 74

Raw Material: Blue-Gray Tan (31), Dark Blue-Gray Tan (13), Blue-Gray Tan Fossiliferous (2), Blue-Gray Oolitic (5), Tan Porcelaneous (2), Gray-Tan Mottled (2), Blue-Gray Banded (5), Tan-Gray-Green (4), Light Gray (2), Gray (2), Dark Gray (3), Black (1), Blue Green (1), Jasper (1)

Discussion

The primary distinction between the three preform stages is reduction refinement. Stage 1 preforms are characterized by large bifacial flake removals while flake scars become increasingly smaller with subsequent stages. In addition, intermittent pressure flaking increases and by the final Stage 3, the preform is refined to the extent that it simply lacks notching and utilization in order to be classified as a finished implement.

Penitentiary Branch cores and blanks rarely display evidence of thermal alteration (*n*=1). Preforms are the first stage of lithic reduction which tend to exhibit thermal pretreatment. Each preform stage, moreover, provides clues regarding the use of heat in lithic manufacture. Evidence of heat alteration is displayed on 7.3 percent (*n*=3) of the Stage 1 preforms; 12.5 percent (*n*=8) of Stage 2; and 19.4 percent (*n*=18) of Stage 3 preforms. Out of the total preforms (*n*=198), 14.6 percent are heat altered with 1.5 percent represented in Stage 1; 4.0 percent represented in Stage 2; and 9.1 percent represented in Stage 3.

While the variable of unintentional heat alteration cannot be factored, the assumption is made that it was intentional. Thermal treatment experiments conducted by Hood and McCollough (1976:195–215) suggest that heating of Fort Payne blue-gray and tan chert and fossiliferous cherts facilitates flaking ease and flake removal size. The Penitentiary Branch core, blank, and preform data therefore indicate cores and blanks were not subjected to thermal treatment; this method of altering the reduction quality of the chert was first employed in the latter stages of preform manufacture.

Comparative preform data is unavailable from the Robinson site. Preforms are not identified from that site, but may be included in a catch-all category of “Other Flint Bifaces” (Morse 1967:84). Some preforms may be included in the 119 lateral edged, oblique-transverse edged, and pointed bifaces (Morse 1967:84); however, Morse (1967:85) indicates that many of these bifaces appear to be implements which have been reworked. Whether or not Robinson site preforms were identified as such, the indication is that they were not as prevalent as at Penitentiary Branch.

Projectile Points/Knives

Bifacial lithic artifacts with complete hafting elements recovered from the Penitentiary Branch site are classified as projectile points/knives. While these artifacts probably functioned primarily as projectile points, attributes such as asymmetrical and beveled or resharpened blades indicate either a primary or secondary knife function. Finally, a small percentage of stemmed artifacts, which originally may have been utilized as projectile points, are classified as to specific implement type rather than projectile point type.

Variations in stem and shoulder morphology were the primary criteria used to separate the 294 projectile points/knives into 32 categories. In some instances these are rather discrete variations; however, the decision to split rather than lump specimens into specific categories was based on the spatial and temporal controls on this assemblage. Although this taxonomic approach adds to the plethora of projectile point types identified from Southeastern sites, morphological attributes and variables are described for each category. As a consequence, specimens are not forced into established typologies which fail to adequately allow for variations as a product of raw material and resharpening. Moreover, these Penitentiary Branch categories are lumped into cluster groups thereby making the taxonomy less cumbersome.

Variables were recorded at area of greatest specimen length, width, and thickness and stem length, width, and thickness. Neck width, lateral side to lateral side, was obtained directly under the shoulder.

Category 1: Auriculate Base (*n*=1)

This artifact exhibited a broken baled and apparent auriculate base. The haft was expanded, with ground lateral edges. Base was incurvate, thinned but unground, and exhibited acute weakly flaring auricles. The haft area is flattened/plano-convex in cross-section (Figure 33a). Although only 17 mm of a single specimen of this type was present in the assemblage, it appears close to the Beaver Lake type (Cambron and Hulse 1975:10) or similar transitional Paleo-Indian period lanceolate types with recurvate blade edges and auriculate bases. This single fragment was recovered from Feature 63, Level 2 (Stratum C).

Raw Material: Light Gray

Category 2: Corner Notched, Prominent Barbs, Expanded Base (*n*=1)

The blade of this artifact was large and triangular in form, with straight edges. It exhibited prominent barbs, deep, narrow corner notches, and an expanded stem terminating in rounded auricles. The base was straight, thinned, and basally ground. Very fine pressure flaking along the lateral edges creates a finely serrated blade which is flattened in cross-section (Figure 33b). Category 2 is referable to the Archaic period Lost Lake type (Cambron and Hulse 1975:83) and the Category 38 (Deep Corner Notched, Straight to Excurvate Ground Base) points recovered from Early Archaic strata in the Little Tennessee River Valley (Chapman 1977:51). The single specimen associated with the Penitentiary Branch site was from surface collection.

Raw Material: Blue-Gray Tan

Category 3: Deep Side Notched, Rectangular Stem (*n*=17)

Category 3 exhibits medium to small elongate, excurvate, or triangular blades with exhibit extensive resharpening, and asymmetrical, excurvate blade edges. The shoulders are horizontal to tapered, and the stem exhibits deep, rounded side notches which are commonly ground. The expanded rectangular stem terminates in square auricles. Bases are straight to incurvate and thinned, with eight specimens exhibiting grinding. This type is biconvex, plano-convex, or flattened in cross-section (Figure 33c).

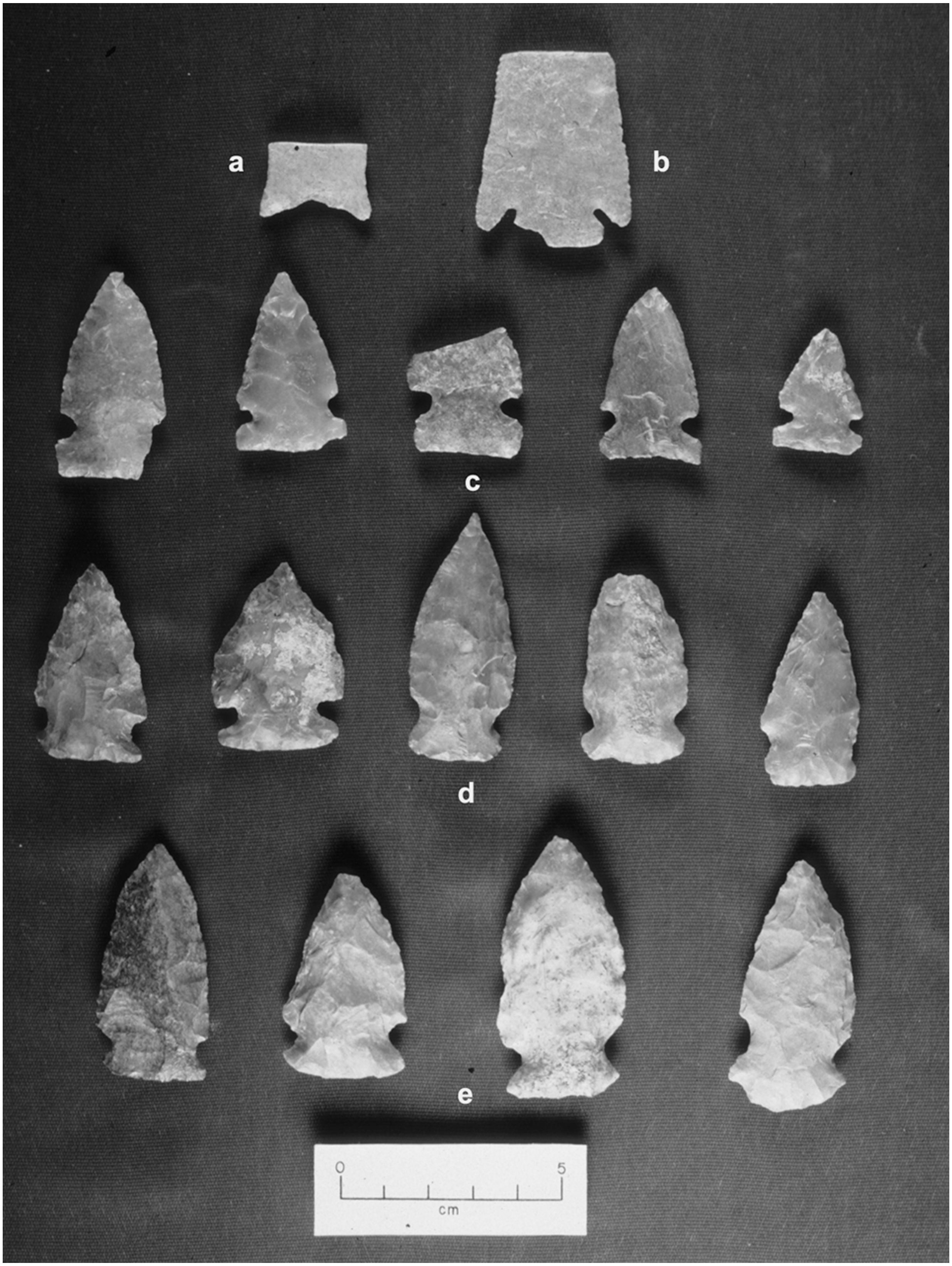

Figure 33. Projectile points/knives: a. Category 1; b. Category 2; c. Category 3; d. Category 4; e. Category 5.

These points were recovered primarily from Stratum C at Penitentiary Branch, and with the exception of basal grinding on 47 percent of the examples, are identical to the Big Sandy I type (Lewis and Kneberg 1959). These projectile points have been recovered from an Early Archaic (10,000 BP) context at the Stanfield-Worley Bluff Shelter (DeJarnette et al. 1962), and from Middle to Late Archaic strata at the Eva site (Lewis and Lewis 1961:37), ca. 4000 to 2000 BC.[17] This later date range is more compatible with Late Archaic context at Penitentiary Branch. Many of the Category 3 specimens exhibit resharpening which accounts for the reduced size of a number of the artifacts.

Raw Material: Blue-Gray Tan (10; 3 Heat), Blue-Gray Tan Fossiliferous (2; 2 Heat), Gray Tan Mottled/Banded (3), Gray (1), Chalcedony (1)

Category 4: Side Notched, Expanded Stem, Tapered Shoulders (*n*=12)

This category features a medium to small blade, typically resharpened, with excurvate to asymmetrical blade edges (Figure 33d). The shoulders are narrow, tapered, and horizontal. Stems are expanding with weakly acute auricles and rounded side notches which may be ground or battered/hinged. Bases vary from straight (*n*=6; 50.0 percent), to weakly excurvate (*n*=3; 25.0 percent), and weakly incurvate (*n*=3; 25 percent), are thinned, and 41.7 percent (*n*=5) exhibit heavy basal grinding. Points are biconvex and plano-convex in cross-section.

These are variants of the Penitentiary Branch Category 3/Big Sandy type and may be lumped with that category. The primary distinction between the two categories is that Category 4 lacks the rectangular base with square/rectangular auricles diagnostic of Category 3. Otherwise the two categories are virtually identical, particularly regarding blade attributes, resharpening, and millimeter measurement means. As Big Sandy/Big Sandy variants, these specimens from Penitentiary Branch Strata G-C are affiliated with the Late Archaic period.

Raw Material: Blue-Gray Tan (9; 2 Heat), Light Gray (1; 1 Heat), Gray (1), Chalcedony (1)

Category 5: Wide Expanded Stem, Side Notched (*n*=12)

Category 5 is medium triangular to excurvate, with straight to asymmetrical blade edges and narrow, tapered shoulders (Figure 33e). Notching grades from side to corner, and are rounded to angular. Stems are broad, expanded, and rounded to acute auricles. Bases are straight (*n*=7), excurvate, and weakly incurvate, and all are thinned. One specimen exhibits basal grinding. Points are biconvex in cross-section.

This category is similar to the “Other Side-Notched, Faulkner type” recovered from the Robinson site (Morse 1967:65) and some illustrated specimens of Undifferentiated Side Notched points recovered from the Three Mile phase at the Eva site (Lewis and Lewis 1961:37–

[17] Big Sandy II points from Eva exhibit unground bases and originate within the Three Mile phase.

38). The context of these types at other southeastern sites, as well as Category 5 at Penitentiary Branch, indicate a Late Archaic period affiliation.

Raw Material: Blue-Gray Tan (6; 2 Heat), Blue-Gray Tan Fossiliferous (1; 1 Heat), Blue-Gray Oolitic (1; 1 Heat), Gray-Tan Mottled Banded (2), Chalcedony (1), Agate (1)

Category 6: Side Notched, Short Expanded Stem (*n*=13)

Blades for Category 6 are elongate to excurvate triangular, with parallel to asymmetrical blade edges that are typically resharpened (Figure 34a). Shoulders are narrow and tapered. Stems are short, broad, and expanded, and exhibit incipient to medium deep rounded side notches with rounded auricles. Bases are straight to weakly incurvate, and thinned, battered, or ground (*n*=4). Points are biconvex (*n*=12) and plano-convex (*n*=1) in cross-section.

These specimens are possibly referable to the Upper Valley Side Notched type (Kneberg 1956) and the Damron type (Cambron and Hulse 1975:40), which have been recovered from questionable Woodland period contexts at sites in the Tennessee and Alabama, but is more firmly affiliated with Archaic period strata (Cambron and Waters 1961; DeJarnette et al. 1962; Morse 1967:64). At the Penitentiary Branch site Category 6 is firmly affiliated with the Late Archaic period and appears to be a terminal variant of the Archaic side notched tradition (Morse 1967:64).

Raw Material: Blue-Gray Tan (5; 3 Heat), Dark Blue-Gray Tan (3; 1 Heat), Blue-Gray Tan Fossiliferous (2), Blue-Gray Oolitic (1; 1 Heat), Gray Tan Mottled (1), Dark Gray (1)

Category 7: Undifferentiated Side Notched (*n*=2)

Category 7 points at Penitentiary Branch exhibit large and triangular blades with asymmetrical edges (Figure 34b). Shoulders are narrow and tapered, and stems are broad and rectangular with shallow side notches and slightly rounded lateral edges. Bases are straight and thinned. These rather amorphous specimens were recovered from Stratum C, Level 3, and the surface at the Penitentiary Branch site. The artifacts are a continuum of the side notched tradition and a Late Archaic cultural affiliation may be suggested. Morphological characteristics of blade size and asymmetry suggest utilization as knives.

Raw Material: Dark Blue-Gray Tan (1; 1 Heat), Light Gray (1: 1 Heat)

Category 8: Side Notched, Deeply Incurvate Expanded Stem, Medium-Small Blade (*n*=28)

This type exhibits narrow blades with excurvate to asymmetrical blade edges (Figure 34c). Shoulders are weak and tapered. Stems are wide and expanded, and exhibit rounded to acute flaring auricles with a “fish-tail” aspect, and shallow to medium side notches. Bases are deeply incurvate to weakly incurvate, thinned, and 22.2 percent (*n*=6) exhibit basal grinding. Category 8 points are biconvex and rarely plano-convex in cross-section.

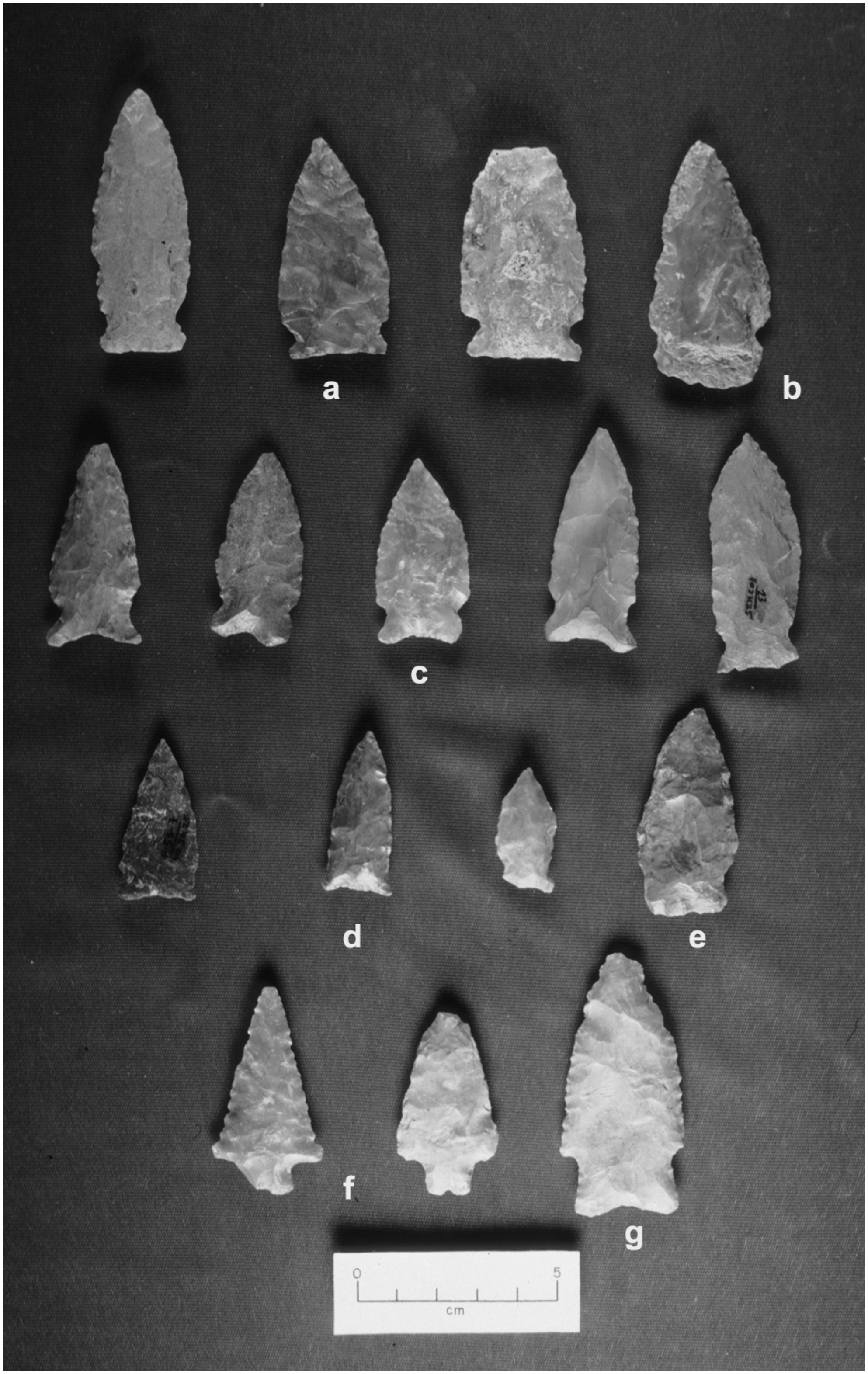

Figure 34. Projectile points/knives: a. Category 6; b. Category 7: c. Category 8; d. Category 9; e. Category 10; f. Category 11; g. Category 12.

These specimens may be referable to the Greenbrier type (Lewis and Kneberg 1960) and the Nickajack Reservoir Provisional Type 9 (Faulkner and Graham 1965:28 Plate XII). Specimens assigned to the Greenbrier type are affiliated with the Paleoindian to Early Archaic in northern Alabama and western Tennessee, and the Late Archaic in northern Alabama. Provisional Type 9 is possibly associated with the Early Woodland period. Whether or not the Penitentiary Branch Category 8 is comparable to the Greenbrier type, it is firmly affiliated with the Late Archaic period at the site. These specimens appear to cluster well with the Category 3/Big Sandy artifacts. A single specimen was utilized as a notched biface.

Raw Material: Blue-Gray Tan (13; 5 Heat), Blue-Gray Tan Fossiliferous (2), Gray-Tan Mottled/Banded (5; 1 Heat), Gray (1), Dark Gray (1), Gray Banded (1), Chalcedony (3), Jasper (2)

Category 9: Shallow Side Notched, Incurvate Expanded Stem, Small Blade (*n*=10)

Specimens in this category exhibit elongate to blades with excurvate to asymmetrical blade edges and are extensively resharpened (Figure 34d). They may have narrow tapered to incipient or non-existent shoulders, and shallow side notches. Stems are wide and expanded with acute to rounded flaring auricles. Bases are incurvate to straight, and may be thinned or in one instance exhibit unfinished cortex. They are biconvex and plano-convex in cross-section.

These specimens may be variants of Penitentiary Branch Category 8. The decision to not to group the two sets of projectile points was based on the variation in stem measurements. While the blade can be expected to be reduced during resharpening, reduction of the stem is not expected. Consequently, the indication is that the Category 9 specimens were originally manufactured on a smaller blank than Category 8.

Raw Material: Blue-Gray Tan (4; 2 Heat), Blue-Gray Oolitic (1), Blue Green (2), Chalcedony (1), Agate (2)

Category 10: Undifferentiated Corner/Side Notched (*n*=2)

Category 10 points exhibit medium triangular blades with asymmetrical edges (Figure 34e). Shoulders are tapered to incipiently tapered and asymmetrical. Stems are wide and weakly expanded, and exhibit weak corner to side notches. The bases are weakly incurvate and thinned, and points are biconvex in cross-section. Similar specimens were recovered from Stratum C, Level 2 at the Penitentiary Branch site (Morse 1967), suggesting a Late Archaic to Early Woodland Period cultural affiliation.

Raw Material: Light Gray (1), Gray Banded (1)

Category 11: Corner Removed, Narrow Stem, Notched Base (*n*=5)

Artifacts in this category are medium to small with overall triangular forms and parallel (*n*=4) to excurvate (*n*=1) blade edges (Figure 34f). One specimen exhibits serrated blade edges.

Shoulders are medium horizontal to weakly inversely tapered. Stems are narrow and straight to weakly expanded (*n*=2) with ground or battered notches. The base is weakly notched or bifurcated (*n*=3) to straight (*n*=1), with one indeterminate. One specimen exhibits a distinctive V-shaped basal notch. Category 11 points are biconvex and plano-convex in cross-section.

The basal element of this category exhibits attributes similar to Stanly Stemmed (Coe 1964:35) and Little Tennessee River Category 15 (Chapman 1977:35). However, blade and stem size of those Middle Archaic points is greater than the Category 11 specimens recovered from Penitentiary Branch. The Penitentiary Branch points were recovered from a Late Archaic period context in Stratum C.

Raw Material: blue-Gray Tan (3; 1 Heat), Gray Tan Mottled/Banded (1), Blue Green (1)

Category 12: Corner Removed, Wide, Long Stem, Incurvate Base (*n*=1)

These triangular points exhibit slightly asymmetrical blade edges and serrated lateral edges (Figure 34g). Shoulders are one horizontal and one tapered. Stems are wide, long, and weakly expanded with an incurvate and thinned base exhibiting weak grinding. The point is flattened with beveled lateral edges in cross-section. This category is referable to the Appalachian Stemmed type (Kneberg 1957:66), and likely affiliated with the Late Archaic period. It was recovered from Level 2, Stratum C, at Penitentiary Branch.

Raw Material: Blue-Gray Tan

Category 13: Short Straight to Weakly Expanded Stem, Asymmetrical Blade (*n*=25)

Category 13 from Penitentiary Branch consists of medium-large triangular to elongate points with asymmetrical to straight blade edges (Figure 35a). Asymmetrical edges diagnostic of knife blades predominate. Shoulders are narrow to medium horizontal, tapered, and rarely weakly inversely tapered. Stems are short and straight to weakly expanded with corner notches. Bases are straight to weakly Excurvate and thinned, while two specimens exhibit basal grinding. These artifacts are biconvex and flattened in cross-section.

This category is perhaps most comparable to Category 100, Medium-Short Straight Stemmed, Narrow Blade described from the Duck River Valley (Faulkner and McCollough 1973:120). The Penitentiary Branch Category 13 point is also referable to the Flint Creek type (Cambron and Hulse 1975:51), although few of the Category 13 blades exhibit serration. Category 13 specimens display extensive evidence of resharpened blades which are commonly asymmetrical and beveled. Although the stem is shorter than the Late Archaic Ledbetter type (Kneberg 1956), blade treatment is similar and may be generally assigned to a Ledbetter group.

Raw Material: Blue-Gray Tan (12; 3 Heat), Blue-Gray Tan Fossiliferous (2), Blue Gray Oolitic (1), Tan-Gray-Green (1), Gray (3), Black (1; 1 Heat), Gray Tan Mottled (2; 1 Heat), Gray Banded (3; 1 Heat).

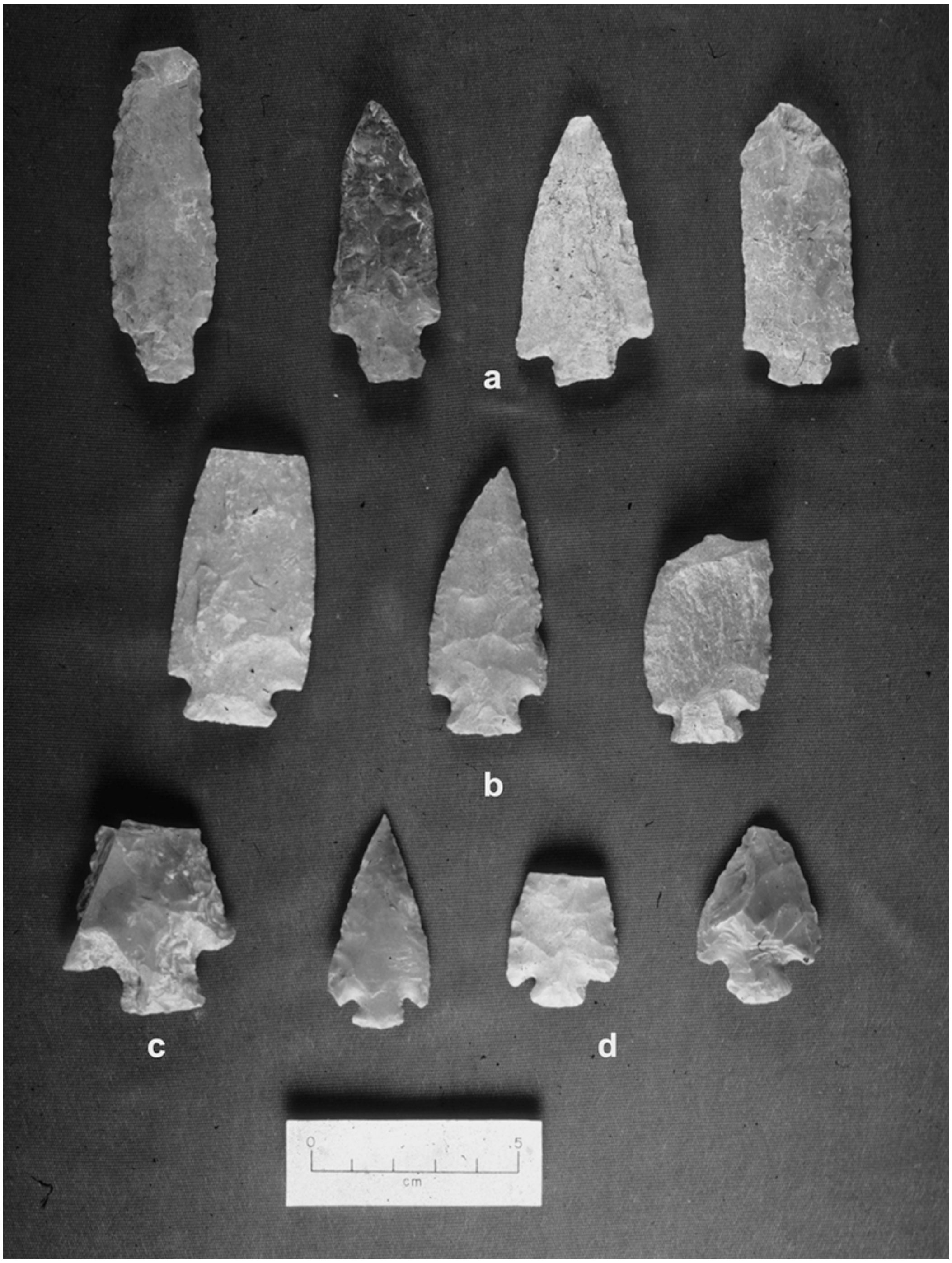

Figure 35. Projectile points/knives: a. Category 13; b. Category 14; c, Category 15; d. Category 16.

Category 14: Short Medium Expanded Stem, Asymmetrical Blade (*n*=22)

Artifact within this category feature medium-large elongate to weakly triangular blades with excurvate and asymmetrical edges (Figure 35b). Shoulders are narrow to medium horizontal, tapered, or rarely inversely tapered. They exhibit wide, rounded notches, and a wide neck terminating in an expanded stem. Bases are thinned and predominantly straight, though occasionally weakly incurvate, with two specimens exhibiting basal grinding. They are biconvex and plano-convex in cross-section.

These specimens are similar to Penitentiary Branch Category 13 in terms of the corner notched shoulders and asymmetrical blades. The major differences are reflected in the stem treatment and blade and stem width: Category 14 is, on the average, 2.6 mm (blade) and 4.6 mm (stem) wider than Category 13. This category also resembles the Ledbetter (Kneberg 1956) and Pickwick types (DeJarnette et al. 1962) with the resharpened asymmetrical blade and asymmetrical shoulders. Both these Late Archaic types are associated with shell middens in northern Alabama and Tennessee. The Penitentiary Branch Category 14 projectile point/knife is affiliated with the Late Archaic period, Strata J, K, C and A.

Raw Material: Blue-Gray Tan (14; 2 Heat), Blue-Gray Tan Fossiliferous (2; 1 Heat), Gray Tan Mottled (2), Tan-Gray-Green (1), Dark Gray (2), Gray Banded (1)

Category 15: Corner Removed, Broad Stemmed, Wide Blade (*n*=3)

These wide, thick, triangular points exhibit parallel straight blade edges, shoulders which are barbed to horizontal, and straight to weakly expanded stems (Figure 35c). Bases are straight and thinned, and one specimen exhibits a weakly ground basal edge. They are biconvex and flattened in cross-section. This category is comparable to Normandy Reservoir Category 104, Medium-Large Straight-Expanded Stemmed, Strong Shouldered, Wide Blade (Faulkner and McCollough 1973:122) and the Cotaco Creek type (DeJarnette, Kurjack, and Cambron 1962). One similar point was recovered from the Robinson site (Morse 1967:75). Penitentiary Branch Category 15 is assigned to the Late Archaic to Early Woodland and is associated with Levels 13, Strata A and C.

Raw Material: Blue-Gray Oolitic (1), Light Gray (1), Dark Gray (1)

Category 16: Inversely Tapered Shoulders, Short Narrow Weakly Expanded Stem (*n*=8)

Category 16 points are small and triangular, with asymmetrical blade edges (Figure 35d). Shoulders are narrow and barbed to inversely tapered. They exhibit short, narrow weakly expanded stems terminating in tapered (rounded) auricles. Bases are straight (*n*=4) to excurvate and thinned, and no specimens exhibit grinding on the base. They are biconvex in cross-section. These artifacts are comparable to the Wade type (Cambron and Hulse 1975:122), recovered from Late Archaic contexts in northern Alabama (Webb and DeJarnette 1948) and southeastern Tennessee (Faulkner and Graham 1966:72), as well as from Early Woodland sites in Alabama and Tennessee. Morse (1967:58) recovered 18 points similar to Category 16 from the Robinson site.

Raw Material: Blue-Gray Tan (5), Blue-Gray Oolitic 1), Light Gray (1; 1 Heat), Gray (1)

Category 17: Barbed Shoulder, Wide Expanded Deeply Notched Stem, Straight Base (*n*=41)

Artifacts within Category 17 from Penitentiary Branch exhibit medium, triangular blades with straight to asymmetrical edges that have been extensively resharpened (Figure 36a). One specimen exhibits grinding on both lateral edges. Shoulders are barbed to inversely tapered. These points have rounded notches, narrow necks, and expanded stems terminating in acutely pointed to tapered auricles. Bases are straight to weakly incurvate and thinned, with nine specimens exhibiting weakly ground bases. They are biconvex to flattened in cross-section.

This projectile point category is comparable to Robinson (Morse 1967:53–58), Motley (Ford et al.) 1955:129–130), and McIntire (Cambron and Hulse 1975:86) points. Those from Penitentiary Branch exhibit moderate to weak barbs and wide expanded stems. The three types referred to above are associated with Late Archaic to Early Woodland period strata in Alabama (Webb and Dejarnette 1948), Kentucky (Webb 1946), Tennessee (Faulkner and Graham 1966; Morse 1967) and the lower Mississippi River Valley (Ford et al. 1955). A Later Archaic period affiliation is indicated for the Cumberland River drainage in Tennessee. The Penitentiary Branch specimens were recovered primarily from Strata A, C, D, E, and G.

Raw Material: Blue-Gray Tan (20; 1 Heat), Dark Blue-Gray Tan (3), Blue-Gray Tan Fossiliferous (6; 1 Heat), Blue Gray- Oolitic (3), Gray (2; 1 Heat), Dark Gray (2; 1 Heat), Gray Banded (3), Blue-Green (1), Jasper (1)

Category 18: Small Horizontal Shoulder, Wide Expanded Deeply Notched Stem, Incurvate Base (*n*=13)

Category 18 consists of medium, triangular points with straight to asymmetrical blade edges that are typically resharpened (Figure 36b). Shoulders are narrow horizontal to inversely tapered, while stems are deep, with rounded notches, widen necks in relation to blade with, and wide expanded stems terminating in tapered to acutely pointed auricles. Bases are incurvate and thinned, and ground on two of the specimens. These points are biconvex and plano-convex in cross-section.

This category closely corresponds to Penitentiary Branch Category 17, with the most noticeable variations being the incurvate base, narrow horizontal to inversely tapered shoulder and wide stem neck (mean of 2.0 mm wider). Consequently, Category 18 shares traits with Robinson projectile points (Morse 1963) but is most similar to the Motley (Ford et al. 1955:129–130) and McIntire (Cambron and Hulse 1975:86) types. All of these types are associated with Late Archaic shell midden sites in northern Alabama, Kentucky, and Tennessee.

Raw Material: Blue-Gray Tan (8; 2 Heat), Tan Porcelaneous (1), Light Gray (1), Gray (2; 1 Heat), Chalcedony (1)

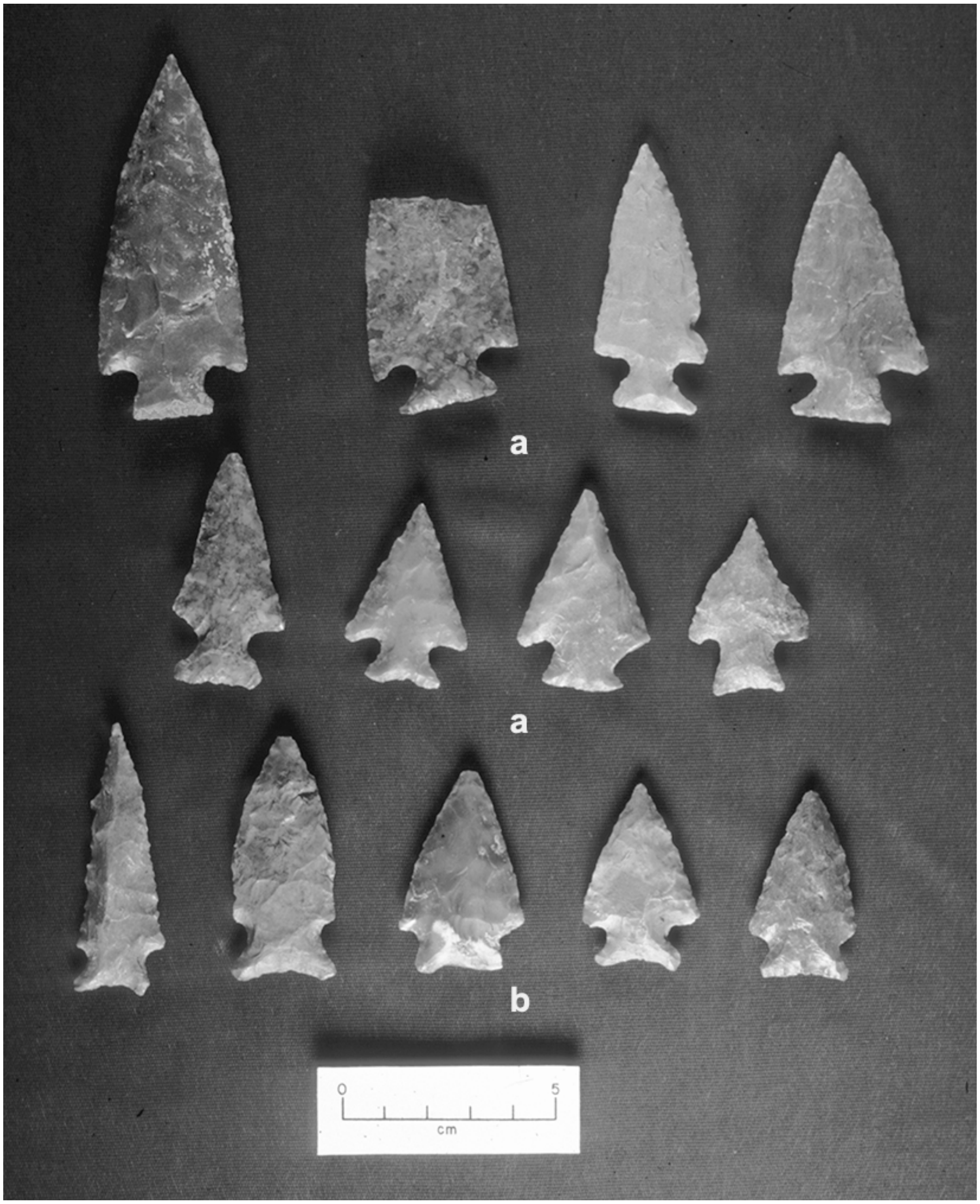

Figure 36. Projectile points/knives: a. Category 17; b. Category 18.

Category 19: Tapered Shoulders; Long, Expanded Stem (*n*=7)

This point type category at Penitentiary Branch consists of narrow and elongate specimens with straight to excurvate blade edges (Figure 37a). At least one example was extensively resharpened. They exhibit narrow, tapered shoulders, wide, elongate notches, and narrow expanding stems terminating in slightly rounded auricles. Bases are straight to excurvate and thinned, while two exhibit basal grinding. They are biconvex in cross-section.

These specimens may be variants of Penitentiary Branch Categories 17 and 18, with primary variation being the tapered shoulder. Motley (Ford et al. 1955) projectile points may be similarly variable with inversely tapered, tapered, and horizontal shoulders (following Cambron and Hulse 1975:92) or long barbs (Ford et al. 1955). Penitentiary Branch Category 4 is associated with the Late Archaic period.

Raw Material: Blue-Gray Tan (4), Blue-Gray Oolitic (1), Tan-Gray-Green (1), Light Gray (1; 1 Heat)

Category 20: Corner Removed, Narrow, Weakly Expanded Stem (*n*=3)

Category 20 points are triangular and elongate with parallel straight blade edges (see Figure 37b). They exhibit medium to broad tapered shoulders, weakly expanded narrow stems, and straight to expanded bases. They are biconvex and plano-convex in cross-section. Artifacts in this category were recovered from Stratum I (Level 8) upwards through Stratum C at Penitentiary Branch. This indicates a Late Archaic period cultural affiliation. The hafting element resembles the Flint Creek type (Cambron and Hulse 1975:51).

Raw Material: Blue-Gray Tan (1; 1 Heat), Blue-Gray Tan Fossiliferous (1; 1 Heat), Blue-Gray Oolitic (1)

Category 21: Corner Removed, Expanded Stem, Straight Base (*n*=12)

Artifacts in Category 21 are medium triangular to lanceolate in form, with parallel and asymmetrical blade edges (Figure 37c). They exhibit horizontal, weakly barbed and tapered shoulders although individual specimens may vary. Stems are medium and expanded with acute to blunt auricles, while bases are straight and thinned. Three specimens exhibit basal grinding. They are biconvex, plano-convex, and flattened in cross-section.

The Penitentiary Branch Category 21 type somewhat resembles Robinson (Morse 1967:53–58), Motley (Ford et al. 1955:129–130), and Penitentiary Branch Category 17 forms. However, greater neck width, shorter stem length, depth of corner removals, and basal form distinguish Category 21 from these three types. Category 21 specimens were recovered from the Late Archaic period Levels 1--4 and 6 (Strata A--D and F) at Penitentiary Branch.

Raw Material: Blue-Gray Tan (7; 1 Heat), Gray-Blue Green (1), Blue-Gray Oolitic (1), Light Gray (1), Gray (1), Blue-Green (1)

Category 22: Medium Shallow Notched, Expanded Stem (*n*=13)

Category 22 consists of narrow to medium elongate lanceolate points with parallel to asymmetrical blade edges and tapered shoulders (Figure 37d). Notches on individual specimens grade from shallow side to corner notched, while stems are broad to medium expanded. Bases for Category 22 are straight to weakly incurvate, and four specimens exhibit basal grinding.

They are biconvex, flattened, and plano-convex in cross-section. The distal ends of 69.2 percent (*n*=9) of Category 22 specimens are rather crudely manufactured and have been broken medially. These specimens may be variants of Penitentiary Branch Category 14. Level distribution indicates a definite Late Archaic period cultural affiliation.

Raw Material: Blue-Gray Tan (8; 4 Heat), Blue-gray tan Fossiliferous (1), Gray Tan Mottled/Banded (1), Light Gray (1), Dark Gray (2)

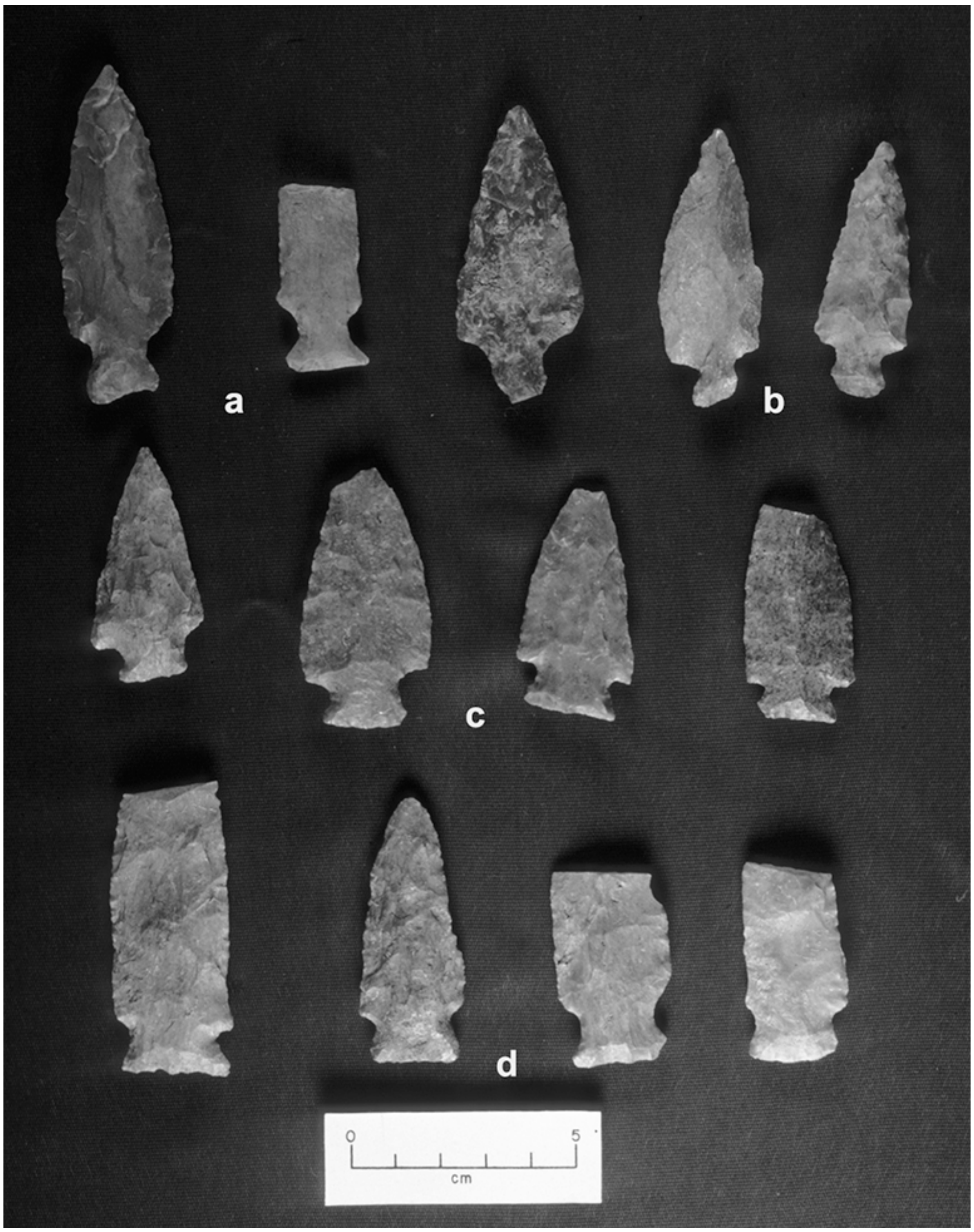

Figure 37. Projectile points/knives: a. Category 19; b. Category 20; c. Category 21; d. Category 22.

Category 23: Corner Notched, Expanded Stem, Straight-Incurvate Base, Small Blade (*n*=9)

Artifacts in Category 23 are small and triangular to lanceolate form with parallel straight to asymmetrical blade edges which have been resharpened (Figure 38a). Shoulders are narrow and weakly tapered, while stems medium expanded stems exhibit moderately deep corner notches. Bases are straight and weakly incurvate, with thinning (*n*=7) and unfinished cortex (*n*=2). Two (22.2 percent) exhibit basal grinding. They are biconvex, plano-convex, and flattened in cross-section.

This category is comparable to Category 84, Medium Undifferentiated Expanded Stemmed, Narrow Blade (Faulkner and McCollough 1973:111) from the Upper Duck River area. The Penitentiary Branch site specimens have smaller blades but the stem attributes and measurements are similar to Category 84. Penitentiary Branch specimens are distributed through the midden from Levels 11–1 (Strata L–A), and are of firm Late Archaic period context.

Raw Material: Blue-Gray Tan (3; 1 Heat), Blue-Gray Oolitic (1; 1 Heat), Gray Tan Mottled (1), Light Gray (1), Gray (1), Dark Gray (1), Chalcedony (1)

Category 24: Small Corner/Side Notched, Expanded Stem, Straight Base (*n*=2)

These lanceolate points exhibit excurvate, symmetrical blade edges and distinct rounded notches. Each specimen exhibits one side and one corner notch (Figure 38b). Shoulders are narrow horizontal to weakly tapered, while stems are medium expanded. Bases are straight and thinned, and cross-section is biconvex. These specimens are probably referable to corner notched and expanding stem types and are associated with the Late Archaic occupation at Penitentiary Branch.

Raw Material: Blue-Gray Tan (1), Agate (1)

Category 25: Corner Notched, Expanded Stem, Excurvate-Straight Base (*n*=10)

Category 25 consists of medium excurvate-triangular and lanceolate forms with parallel and asymmetrical blade edges that commonly exhibit resharpening (Figure 38c). Shoulders are asymmetrical, prominently tapered, and horizontal, while stems are wide to medium expanded with blunted to flaring auricles. Category 25 points exhibit deep corner notches and excurvate to straight thinned bases. Four specimens exhibit basal grinding. These points are biconvex and plano-convex in cross-section, and are analogous to examples of the Corner Notched/Corner Removed type (Chapman1981:78) from the Little Tennessee River Valley. Category 25 specimens were recovered from Late Archaic Strata A–C at Penitentiary Branch.

Raw Material: Blue-Gray Tan (3), Blue-Gray Tan Fossiliferous (1), Dark Blue-Gray Tan (1; 1 Heat), Tan-Gray-Green (1), Light Gray (2), Gray (1; 1 Heat), Blue-Green (1)

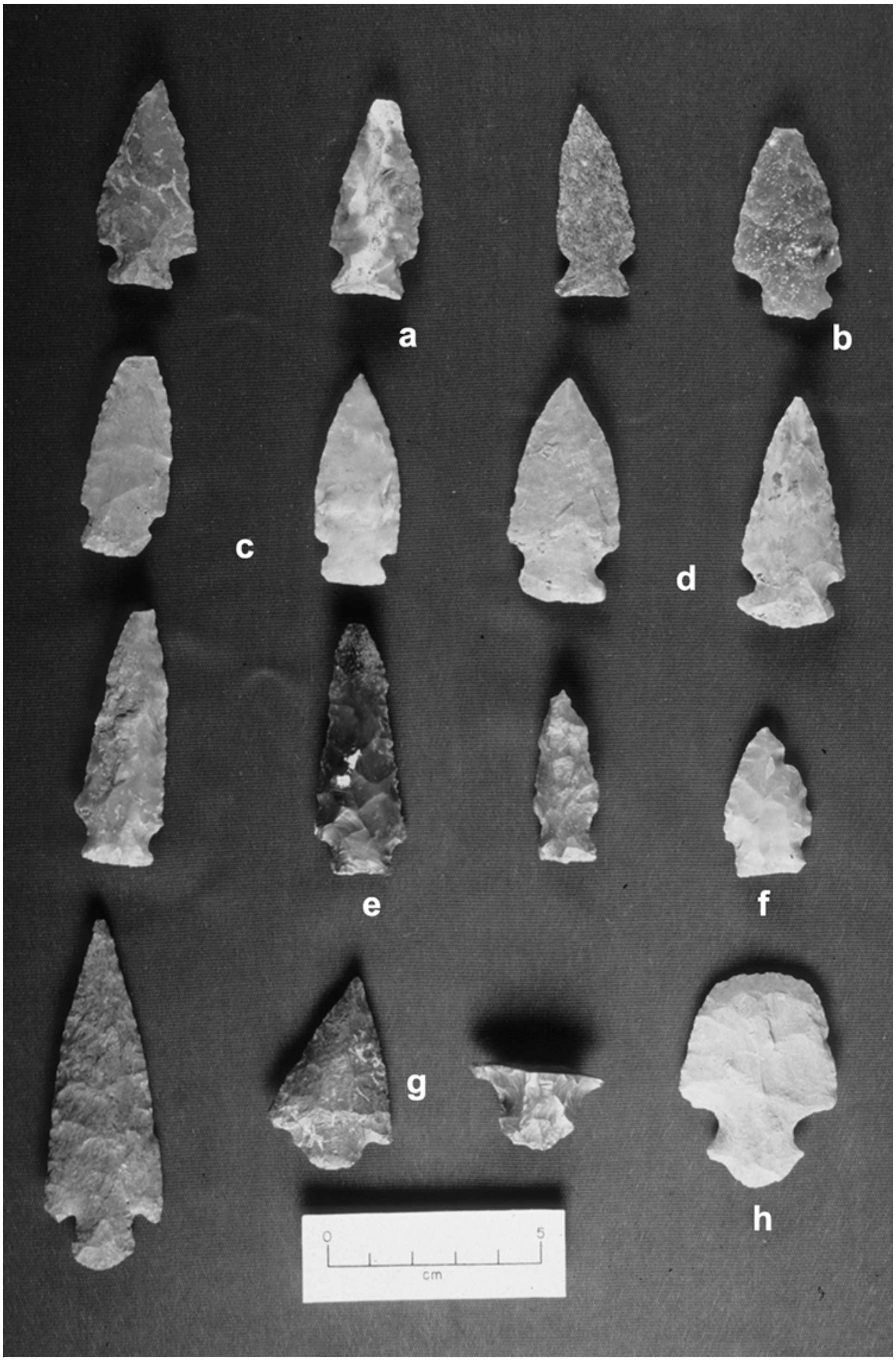

Figure 38. Projectile points/knives: a. Category 23; b. Category 24; c. Category 25; d. Category 26; e. Category 27; f. Category 29; g. Category 30; h. Category 32.

Category 26: Corner Removed, Short Expanding Stem, Narrow Elongate Blade (*n*=10)

Artifacts from Category 26 at Penitentiary Branch are narrow and elongate to triangular with straight to asymmetrical blade edges (see Figure 38d). Shoulders are tapered to weakly tapered, and the stems are short and weakly expanded. These points exhibit straight and thinned bases. One specimen retains cortex on a portion of the basal edge, while a second exhibits heavy grinding on the basal edge. They are plan-convex, rhomboidal, and biconvex in cross-section.

Category 26 specimens were recovered from Late Archaic affiliated Strata A–C and F–G at Penitentiary Branch. The plano-convex and rhomboidal cross-section as well as the blade width of Penitentiary Branch Category 26 strongly suggests drills morphology. However, these specimens exhibit no polish or edge grinding. Several have been extensively resharpened.

Raw Material: Blue-Gray Tan (3: 2 Heat), Blue-Gray Tan Fossiliferous (1), Tan-Gray-Green (1), Blue-Gray Oolitic (1), Gray-Tan Mottled (1), Dark Gray (1), Blue-Green (2)

Category 27: Corner Removed, Straight Stem (*n*=2)

These lanceolate-triangular forms exhibit asymmetrical blade edges, narrow horizontal shoulders, and wide, straight stem with incipient auricle on one lateral edge (see Figure 38e). Bases are straight, and one of the two specimens exhibits a weakly ground basal edge. They are biconvex and plano-convex in cross-section. Specimens were recovered from Levels 1 and 2, Strata A and C at Penitentiary Branch.

Raw Material: Light Gray (2)

Category 28: Corner Removed, Straight/Contracted Stem, Elongate Blade (*n*=2)

Category 28 points are narrow, elongate and elongate-triangular with straight blade edges and narrow (incipient) tapered shoulders. Stems are wide straight to weakly contracted, and bases are straight and thinned. They are biconvex in cross-section. These artifacts may have functioned primarily as knives, and were recovered from the plowzone and Stratum C at Penitentiary Branch.

Raw Material: Blue-Gray Tan (1), Indeterminate Water Worn Chert (1)

Category 29: Corner Removed, Rounded Stem, Barbed Shoulders (*n*=5)

These points are elongate-triangular and triangular with straight and asymmetrical blade edges (see Figure 38f). Shoulders are barbed, while stems are contracted-rounded and weakly expanded-rounded. Their bases are rounded and thinned, and they are biconvex, flattened, and weakly beveled in cross-section. These artifacts display some characteristics of the Late Archaic-Early Woodland period Wade (Cambron and Hulse 1975:122) and Gary (Newell and Krieger 1949:164) types, and resemble Penitentiary Branch Category 16. However, the distinctively excurvate to rounded stem base makes this later correlation uncertain. The specimens of Category 29 were recovered from Stratum C at Penitentiary Branch.

Raw Material: Blue-Gray Tan (1), Blue-Gray Tan fossiliferous (1), Blue-Gray Oolitic (1), Gray Banded (1), Gray (1)

Category 30: Corner Removed, Contracted Stem, Round Base (*n*=1)

The single, partial example of a Category 30 point from Penitentiary Branch exhibits a wide, contracted-rounded stem and tapered shoulders (see Figure 38g). The base is rounded and partially thinned, and exhibits battering on the basal edge. This point may be comparable to the Late Archaic-Early Woodland Gary type (Newell and Krieger 1949:164), and was recovered from Feature 123, Level 2 at Penitentiary Branch.

Raw Material: Dark Gray

Category 31: Corner Removed, Expanded Stem, Small Blade (*n*=1)

This short, expanded point exhibits medium asymmetrical and tapered shoulders, a medium expanded stem, and excurvate, thinned base. It is plano-convex in cross-section, and was recovered from a Late Archaic context at Penitentiary Branch.

Raw Material: Blue-Gray Tan

Category 32: Corner Removed, Wide Expanded Rounded Stem (*n*=1)

Category 32 consists of a single triangular point refashioned as an end scraper (see Figure 38h). It exhibits weakly tapered shoulders, and a wide expanded-rounded stem with wide barbs on the lateral edges. The base is long, rounded, and thinned, and the point is biconvex in cross-section. This specimen was recovered from Stratum C, and is somewhat similar to the Bacon Island type (Cambron and Hulse 1975:9). A Late Archaic cultural affiliation is suggested for this specimen, which is cross referenced as a Category 7 bifacial end scraper.

Raw Material: Blue-Gray Tan

Projectile Point Fragments

<u>Distal Fragments</u> (*n*=178)

Raw Material: Blue-Gray Tan (88), Tan-Gray-Free (14), Light Gray (10), Gray (13), Dark Gray (7), Dark Blue-Gray Tan (12), Blue-Gray Tan Fossiliferous (7), Gray-Tan Mottled (7), Tan Porcelaneous (8), Blue-Gray Oolitic (4), Blue-Gray Banded (2), Agate (3), Chalcedony (2), Gray Banded (1)

Medial Fragments (*n*=38)

Raw Material: Blue-Gray Tan (2), Dark Blue-Gray Tan (2), Light Gray (1), Gray (4), Gray-Tan Mottled (4), Blue-Gray Tan Fossiliferous (3), Blue-Gray Oolitic (2), Blue-Gray Banded (1), Blue-Green (1)

Proximal Fragments (*n*=10)

Raw Material: Blue-Gray Tan (4), Blue-Gray Tan Fossiliferous (2), Dark Blue-Gray Tan (2), Gray Tan Mottled (1), Gray (1)

Discussion

At least 80.6 percent (*n*=237) of the 294 projectile points from Penitentiary Branch are manufactured of Fort Payne chert, with the majority of those from Blue-Gray Tan chert. In addition, 19.7 percent (*n*=58) display obvious and detectable thermal alteration.

Most of the Penitentiary Branch projectile points can be categorized into four collective groups (after Faulkner and McCollough 1973) on the basis of similar hafting elements. Although total implement (including stem) length, width, and thickness were recorded, stem metrics seem most reliable for assigning projectile points/knives to specific categories. Factors governing variability of metric attributes within a specific category may be a product or raw material and/or functional processes such as resharpening. Specimens within each group are chronologically similar as established by site context and radiocarbon dating from Penitentiary Branch and other mid-South Archaic site investigations (DeJarnette et al. 1962; Lewis and Kneberg 1959; Lewis and Lewis 1961; Morse 1967). Placement of several of the projectile point categories into the four groups illustrates the artifacts can be lumped for a synoptic view.

Side Notched (Big Sandy) Group.[18] Categories 3, 4, 5, 6, and 7 fit well within this group. Side notched points, designated as the Big Sandy type, have been recovered from Early Archaic (DeJarnette et al. 1962; Fowler 1959:19) through Late Archaic (Lewis and Lewis 1961:37; Morse 1967:64) contexts. As a result of excavations of the Three Mile component at the Eva site, Lewis and Lewis (1961:37) place unground Big Sandy variants at ca. 4000 to 2000 BC. The occurrence of “classic” Big Sandy type points, Category 3, and probable variants predominately in Levels 1, 2, 3, and 4 (Strata C) at the Penitentiary Branch site suggests the side notched point dates from 3185 to 2975 BP.

The Penitentiary Branch Side Notched group is of apparent local manufacture with 87.5 percent (*n*=49) of the 56 points made of Fort Payne chert and 55.4 percent (*n*=31) from Blue-Gray Tan chert.

[18] Only 32 percent (18 of 56) points in this group exhibit basal grinding. This suggests that the bulk of the side notched points from Penitentiary Branch are more properly lumped into the Late Archaic Big Sandy II tradition.

Side Notched Incurvate Base Group.[19] Side notched and incurvate base Categories 8, 9, and 10 are similar to the Greenbrier type (Lewis and Kneberg 1960), although the validity of the Paleo-Indian through Late Archaic period assignment of this type in Tennessee and Alabama is not well established; consequently, this Penitentiary Branch group should not be seriously affiliated with that type.

Side notched and incurvate base points occur at Penitentiary Branch in Strata A-C; associated dates range from 3185–2975 BP, uncorrected. This group, therefore, appears to be affiliated with the Side Notched group and may be a variant or a late form in that tradition. Of the 40 specimens, 67.5 percent (*n*=27) are comprised of Fort Payne chert.

Corner Removed, Asymmetrical or Broad Blade (Ledbetter) Group. This group is composed of Categories 12, 13, 14, 15, and 22 which are similar to such named types as Ledbetter and Cotaco Creek. The approximated date for Ledbetter is 2800 BC (Lewis and Kneberg 1959). At the Robinson site, 55 Ledbetter points were recovered (Morse 1967:45) from contexts ranging from approximately 1280–500 BC. At Penitentiary Branch, specimens comprising this cluster were recovered from Levels 1–9, with dominant occurrence in Levels 1–5 (Strata A-F). Consequently, the group would range from approximately 3375–2975 BP. Of the 64 specimens included in this group, 84.4 percent (*n*=54) are manufactured of Fort Payne chert. The majority of these 54 specimens are of Blue-Gray Tan chert.

Corner Removed/Notched, Expanded Stem (Motley/Wade/Robinson) Group. Categories 16, 17, 18, 19 and 21 are similar to the Wade, Motley, Robinson, and McIntire types. The Wade type, affiliated with the Late Archaic–Early Woodland horizon at the Tennessee Westmoreland-Barber site, where it was dated from 755–340 BC. Wade, Motley, and Robinson type points were all recovered from Robinson Shell Mound, where dates range from 3230–2450 BP. At Penitentiary Branch this group occurs predominantly in Levels 1–4 and occasionally Level 6. The group would therefore date from approximately 3050–2975 BP. This group comprises the largest number of specimens (*n*=81) of the four point groups from the site. Approximately 84 percent (*n*=68) of the Corner Removed/Notched, Expanded Stem specimens are manufactured of Fort Payne chert, with 54.3 percent (*n*=44) of these from Blue-Gray Tan chert.

Other Chipped Stone Implements

Knives

This functional classification is characterized by attributes which include an asymmetrical blade edge which is acute and sinuous. Sixteen bifacial and unifacial specimens were classified as knives, and further subdivided into five categories.

[19] Cursory reexamination of points from this group suggest some fall within the range of the Big Sandy / Big Sandy Auriculate typology rather than the suggested Greenbrier type.

Category 1 included six auriculate or stemmed bifaces with asymmetrical or beveled blade edges. Stems on these artifacts were corner- or side notched with weak tapered shoulders (*n*=3), while bases were straight or incurvate with evidence of thinning and grinding on two specimens. Several specimens exhibit beveled blades due to resharpening. Category 1 knives are biconvex, plano-convex, and beveled in cross-section.

Raw Material: Blue-Gray Tan (3: 1 Heat), Dark Gray (3)

Category 2 consisted of seven medium to large bifaces with triangular or contracted basal areas. Blades were asymmetrical, with sinuous blade edges. Basal areas were triangular or contracted, with straight or excurvate bases which on three specimens exhibit grinding. Four specimens were poorly thinned near one lateral edge, while acute lateral edges of three specimens create ad beveled effect. Cross-section: biconvex, plano-convex, and beveled. Knife specimen 1023–6 is unique in that it exhibits extensive resharpening from use and “classic” knife characteristics including an acute tip and triangular rounded base. Blade edges are beveled along both lateral edges.

Raw Material: Blue-gray Tan (3; 1 Heat), Dark Blue-Gray Tan (1), Gray Tan Mottled (1; 1 Heat), Tan-Gray-Green (1), Non-local Chert (1)

Category 3 included a single roughly oval biface made from Blue-Gray Tan chert, with an acute tip and one steep, sinuous lateral working edge. The blade was asymmetrical and sharpened, with use-wear macroscopically visible along the single working edge. The basal area was rounded/oval, and the artifact was plano-convex in cross-section.

Category 4 consists of a single rectangular bifacial backed knife made from Blue-Gray Tan Fossiliferous chert. The blade is bifacially flaked along one edge, while the opposing edge consists of the flat, unmodified natural fracture plane. Both the distal and proximal ends exhibit snap fractures. This artifact is biconvex in cross-section.

Category 5 is comprised of a single heat-treated lanceolate unifacial knife with acute lateral edges, made from Blue-Gray Tan chert. The blade is weakly asymmetrical with one steep working edge, while the opposite lateral edge less acute and terminates in an acute distal end. The base exhibits crenated fracturing. The artifact is plano-convex in cross-section.

Scrapers (*n*=15)

Implements classified as scrapers are characterized by continuous, regular retouch along one or both lateral edges, the distal end, or both. Penitentiary Branch site scrapers included unifacial end and side scrapers (*n*=5), unifacial end scrapers (*n*=4), unifacial side scrapers (*n*=4), bifacial end scrapers (*n*=1), and core scrapers (*n*=1).

Unifacial End and Side Scraper, Category 1 (*n*=3). Specimen 1 (Figure 39e) was manufactured on a heat-treated Blue-Gray Oolitic chert blade and exhibits acute lateral edges characterized by fine flake scars and batter produced during use. The distal end exhibits acute percussion flake removals and use-wear, while the proximal end retains striking platform and cortex. The ventral side is slightly incurved.

Specimen 2 was manufactured on a thick bifacial reduction flake of Dark Blue-Gray Tan chert. The lateral edges exhibit direct percussion flake removals producing steep and acute edges showing battering and small flake scars from use-wear. The distal end is steep and acute, similar to “thumbnail” end scrapers, and shows batter and use-wear. The proximal end features the striking platform and some cortex.

Unifacial End and Side Scraper, Category 2 (*n*=3). These amorphous scrapers are manufactured on flakes, and exhibit lateral edges which are acute and show batter and use-wear. Their distal ends are acute, with extensive batter. Striking platforms and hafting areas are distinguishable on the proximal ends. Ventral sides are flat to weakly curved. Raw material for this category included Blue-Gray Tan (1), Dark Blue-Gray Tan (1), and Blue-Gray Tan Fossiliferous (1) chert.

Unifacial End Scraper, Category 3 (*n*=3). These tools are manufactured on bifacial thinning flakes, with percussion flaking on the distal ends utilized to produce an acute working edge. The working edges exhibit batter (*n*=3) and polish (*n*=1). Proximal ends show the striking platform, while ventral sides are flat to weakly curved. Raw material types included Gray-Tan Mottled/Banded (1), Gray (1), and Dark Blue-Gray Tan (1) chert.

Unifacial End Scraper, Category 4 (*n*=1).The single example of category 4 is an end scraper manufactured from Blue-Gray Tan chert on a long distally expanded flake. The distal end exhibits an obtuse angle, and is expanded and rounded, while the working edge displays batter and grinding extending onto ventral surface. The proximal end shows a flat striking platform and tapered end which may have served as hafting element. The ventral surface is weakly curved.

Unifacial Side Scraper, Category 5 (*n*=4). These side scrapers are manufactured on amorphous, thick flakes and exhibit working edges which are acute and battered. The ventral and dorsal surfaces are unmodified, and one specimen retains cortex on dorsal surface. Striking platforms may or may not be present on the proximal end. There is no evidence of hafting elements. The raw material consists of Blue-Gray Tan (3) and Black (1) chert.

Bifacial End Scraper, Category 6 (*n*=1). This triangular end scraper was manufactured on a biface made from Blue-Gray Tan chert. The distal end shows a working edge with batter and polish, while the proximal end is expanded with a triangular basal area. The base is weakly incurvate.

Bifacial End Scraper, Category 7 (*n*=1). This end scraper is manufactured on a bifacial projectile point made from Blue-Gray Tan chert. The working edge exhibits polish and is “thumbnail” in relation to the angle; with a width of 23 mm. The proximal end exhibits an expanded-rounded stem. The projectile point on which this tool is made may be cross referenced as projectile point/knife Category 32.

Drills (*n*=27)

Drills are characterized by long, narrow bits/blades which are triangular, rhomboidal, or quadrilateral in cross-section. Bits are bifacially worked and expand slightly from the tip to the base. The 27 drills recovered from the Penitentiary Branch site excavations were subdivided into six categories.

<u>Stemmed Drill, Category 1</u> (Figure 39a) (*n*=4). These are bifacial implements, presumably manufactured from projectile points. All specimens are characterized by corner removed/notched stems. Bits are rhomboidal (*n*=2) and triangulate (*n*=2) in cross-section, and show signs of batter (*n*=2) and polish (*n*=1). Two specimens display long, straight corner removed stems with straight bases; however, the projectile point category from which they were manufactured is indeterminate. A third drill with a corner notched expanded stem and straight base in addition to barbed shoulders suggests the Wade-Motley-Robinson projectile point group. The fourth specimen is corner notched, straight based, and shoulders are tapered; it is analogous to projectile point Category 17. Raw material includes Blue-Gray Tan (1), Blue-Gray Oolitic (1), and Black (2) cherts.

<u>Expanded Triangular to Rounded Based Drill, Category 2</u> (Figure 39b) (*n*=11). Category 2 consists of bifacial implements with an expanded triangular, rounded, or rectangular basal/hafting areas. Bits are rhomboidal (*n*=5) and triangular (*n*=6) in cross-section and show polished/grinding (*n*=2), battering (*n*=3), both batter and polish (*n*=1), or no visible wear (*n*=5). Raw material types include Blue-Gray Tan (7), Light Gray (1: 1 Heat), Gray (1), and Tan Porcelaneous (2) chert.

<u>Rough, Chunky Bifacial Drill, Category 3</u> (Figure 39c) (*n*=2). These drills were manufactured on chunky, moderately flaked bifaces with unfinished hafting areas. Bits are rhomboidal in cross-section. Bases are unfinished with striking platforms of large, thick, bifacially reduced flakes. These tools were manufactured from Tan-Gray-Green (1) and Blue-Gray Banded (1) chert.

<u>Unhafted Bifacial Drill, Category 4</u> (Figure 39d) (*n*=5). Straight bifacial drill bits with flat unfinished bases and no hafting element. Bits are rhomboidal (*n*=4) and triangular (*n*=1 in cross-section), and appear battered (*n*=2), battered and polished (*n*=2), or with indeterminate use-wear (*n*=1). Category 4 tools are manufactured from Blue-Gray Tan (1), Blue-gray Fossiliferous (1), Tan Porcelaneous (1), Dark Gray (1), and Tan-Gray-Green (1) chert.

<u>Flake Drill, Category 5</u> (Figure 39e) (*n*=3). These drills are made on bifacial thinning flakes with unmodified bases/hafting areas and bifacially flaked bits. Bits are triangular (*n*=1) or beveled (*n*=20) in cross-section. Bit use-wear includes battering (*n*=1), and both batter and polish (*n*=1), along with one example which has been retouched. They are manufactured from Blue-Gray Tan (1) and Blue-Gray Tan Fossiliferous (2) chert.

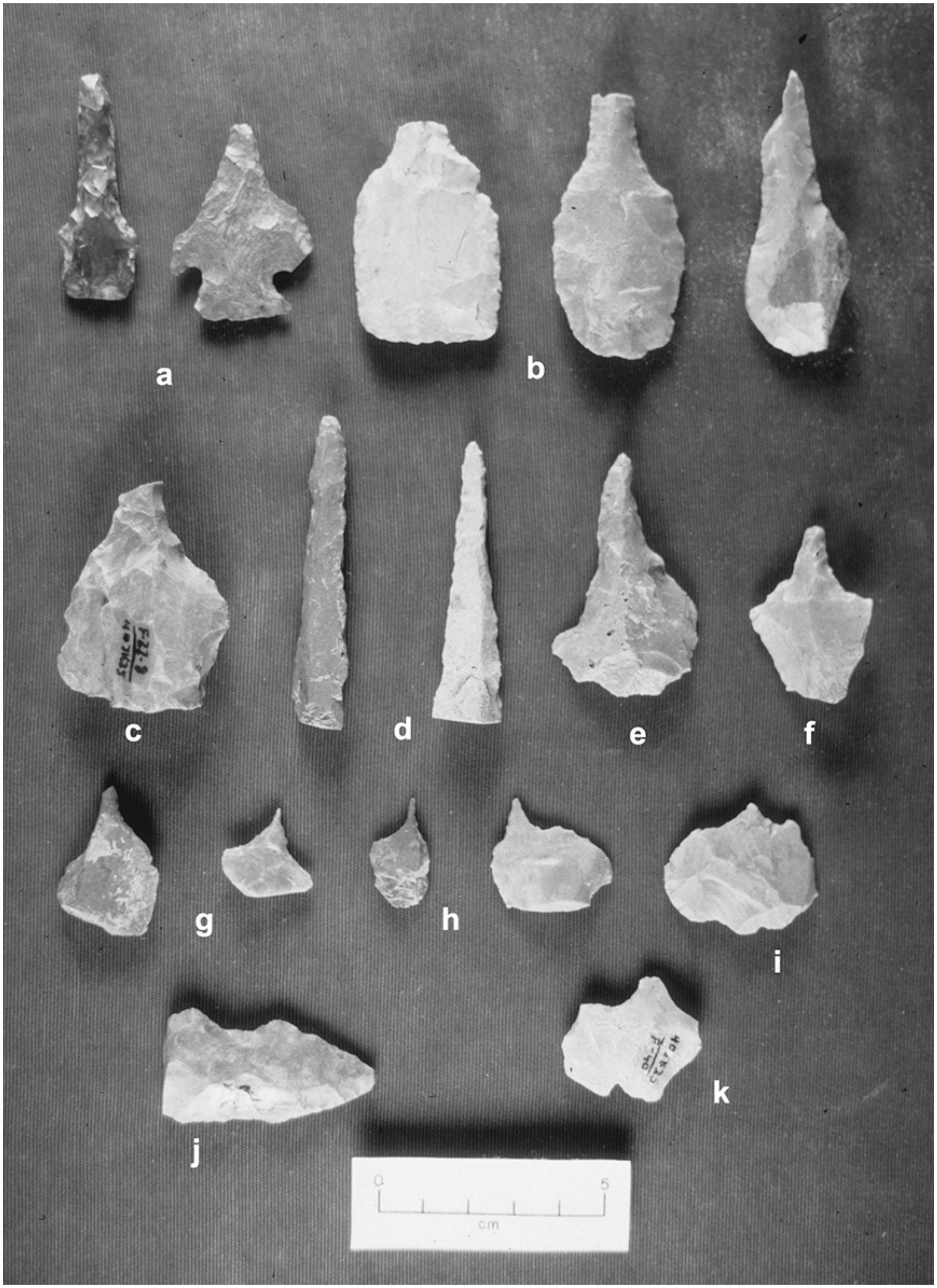

Figure 39. Drills, perforators and notched flakes: a. Drill, Category 1; b. Drill, Category 2; c. Drill, Category 3; Drill, Category 4; E. Drill, Category 5; f. Drill, Category 6; g. Perforator, Category 1; h. Perforator, Category 2; i. Perforator/Graver; j. Notched Flake; k. Notched biface.

Modified Nodule Drill, Category 6 (Figure 39f) (*n*=2). These tools are manufactured on partially and roughly bifacially modified Blue-Gray Tan chert nodules with amorphous basal areas. Bits are rhomboidal and triangular in cross-section, and show polish on the distal end and lateral edges (*n*=1) as well as minor battering (*n*=1). The basal areas are unmodified.

Broken Drill Bits (*n*=12). Broken drill bits were manufactured from Blue-Gray Tan (2), Blue-Gray Tan Fossiliferous (2), Blue-Gray Oolitic (1), Gray-Tan Mottled (1), Dark Blue-Gray Tan (2), Light Gray (2), and Black (2) cherts. Two specimens showed macroscopic polish.

Drill Preforms (*n*=3). Three bifacially flaked artifacts exhibit expanded basal areas and tapered distal ends suggestive of drill bits. These distal ends, however, are partially flaked but unfinished. Specimen 1059–5 is triangular and made from Gray Banded chert, with a straight base and manufactured on a decortications flake. The tapering distal end is beveled with bifacial flaking on one lateral edge, while the opposing lateral edge is flaked on the ventral surface but cortex is retained on the dorsal.

Specimen 1001–5 is an expanded and rounded thinned biface made from Blue-Gray Tan chert with a small projection of the striking platform at the base. The short tapered triangular "bit" appears burinated on one lateral edge while the opposing edge is similar but the product of a fracture plane. The artifact is not actually burinated.

Specimen 1078–2 is a thick roughly flaked nodule made from Blue-Gray Tan chert, with an expanded slightly triangular basal area and a weakly excurvate cortex-covered base. The triangular, tapered projection exhibits flake removals, a natural fracture plane, and a single long, narrow flake driven from the broken apex to the base of the projection.

Perforators (*n*=14)

Perforators are characterized by thin, narrow or narrow tapered projections formed by unidirectional flake removals from the lateral edges. The 14 specimens recovered from Penitentiary Branch were manufactured on small to medium bifacial thinning or decortications flakes.

Perforator, Category 1 (Figure 39g) (*n*=11). Perforators on bifacial thinning or decortication flakes. Perforator projection removals on both lateral edges run from the ventral to dorsal surface and the projection is opposite the striking platform. Raw material types include Blue-Gray Tan (7), Dark Blue-Gray Tan (3), and Indeterminate, Water Worn (1) chert.

Perforator, Category 2 (Figure 39h) (*n*=3). Perforator manufactured on a flake. Projection removals are from ventral to dorsal surface on one lateral edge and dorsal to ventral on the opposing lateral edge. Projection is directly opposite striking platform. Raw material types include Blue-Gray Tan (1) and Blue-Gray Oolitic (2) chert

Denticulate (*n*=1). A denticulate is a flake with an intentionally produced serrated edge produced by several single- or multiple-blow removals. A single specimen manufactured on a bifacial thinning flake of Gray Banded chert was identified from the Penitentiary Branch site.

Perforator/Denticulate (*n*=1). A Category 2 perforator and denticulate manufactured on a bifacial thinning flake of Blue-Gray Tan chert. The perforator bit is asymmetrical and the denticulate notching runs along one lateral edge immediately below the projection.

Perforator/Graver (Figure 39i) (*n*=1). A bifacial thinning flake of Blue-Gray Tan chert modified with a Category 1 perforator, and a graver spur is opposite the flake striking platform.

Drill/Graver (*n*=1). A broken medial portion of a Blue-Gray Tan bifacial drill, the proximal end of which has been modified to create a single graver spur.

Notched Flake/Notched Biface (*n*=10)

These artifacts consist of a flake or biface characterized by a deep and broad notch created by multiple flake removals. Fifty percent of the notched flakes and bifaces display minor use-wear.

Notched Biface (Figure 39j) (*n*=5). One specimen is manufactured on the lateral edge of a broken and unidentifiable projectile point. A second artifact is notched on the lateral edge of a Category 8 projectile point/knife. Examples include Blue-Gray Tan (4) and Dark Blue-Gray Tan (1) chert. One notch is present on each specimen.

Notched Flake (Figure 39k) (*n*=5). Examples include Blue-Gray Tan (3), Dark Blue-Gray tan (1), and Blue-Gray-Green (1) chert. One notch is present on each specimen.

Chisels (*n*=4)

The Penitentiary Branch assemblage includes four elongate rectangular bifaces characterized by roughly parallel lateral edges terminating in a tapered but broad straight to curved/rounded distal end (Figure 40a). All examples are manufactured on Blue-Gray Tan chert. These artifacts exhibit refined bifacial flaking of distal working end to approximately one-third length of implement, with the remaining portion roughly bifacially worked. Distal ends show use-wear attrition and minor batter and polish. The proximal ends are unfinished, straight and flat. One specimen displays deep, broad side notching immediately below the distal working end.

Adzes (*n*=4)

A thick, broad, and elongate roughly square to rectangular biface which displays a broad curved distal working end. Due to distinctions in size, raw material, and use-wear, the four adzes identified from Penitentiary Branch were subdivided into two categories.

Adze, Category 1 (Figure 40b) (*n*=2). Category 1 exhibits refined bifacial reduction, with distal ends that are broad and curved, with minor attrition. They are manufactured from Blue-Gray Tan (1) and Blue-Gray Tan Fossiliferous (1) chert.

Adze, Category 2 (Figure 40c) (*n*=2). These limestone tools are roughly bifacially flaked, with broad and curved distal ends, minor grinding/polish on one surface and a small portion of working edge, and extensive polish/grinding on ventral and dorsal surfaces well back from working edge.

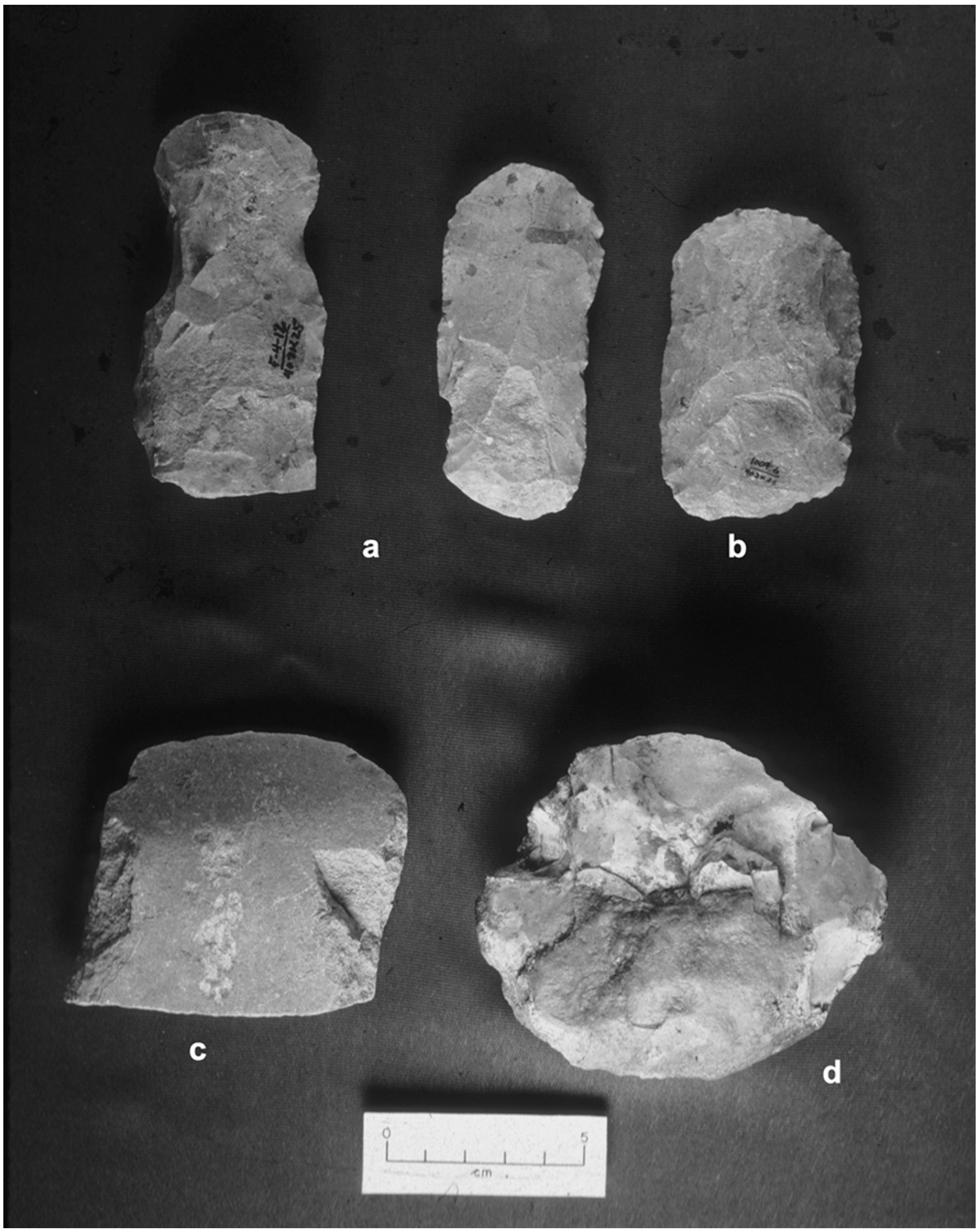

Figure 40. Chipped stone implements: a. Chisels; b. Adze, Category 1; c. Adze, Category 2; d. Cobble chopper.

Cobble Chopper (*n*=1)

One chalcedony cobble/nodule was characterized by bifacial flake removals to form a sharp edge on the distal end that exhibits batter and use-wear (Figure 40d). Approximately one half of the remainder of the nodule retained natural cortex on entire surface.

Chipped Stone Digging Implement (*n*=17)

This artifact category includes 17 thin, oval to oval-elongate, coarse-grained limestone slabs which have been bifacially flaked approximately 15 mm from the lateral edges onto ventral and dorsal surfaces around the entire perimeter (Figure 41). These implements, assumed to have functioned as digging implements such as hoes, display intermittent to extensive grinding and polish on the distal working edge (*n*=11). Eight specimens are characterized by obvious hafting elements and in general, the proximal end is narrow with the distal end flared and broad. The proximal end base/haft is generally straight or rounded. Hafting elements were commonly produced by wide single-and occasional multiple-blow side notching. The neck width and notch length (parallel with the lateral edge) are indicated below.

Bifacial Fragments (n=93)

Ninety-three bifacially reduced fragments badly broken and could not be assigned to any reduction sequence. Raw material types represented in this category include: Blue-Gray Tan (6), Dark Blue-Gray Tan (3), Blue-Gray Oolitic (4), Blue-Gray Tan Fossiliferous (1), Tan-Gray-Green (2), Blue-Gray Banded (2), Light Gray (2), Gray-Tan Mottled (1), Gray (2), Dark Gray (2), Black (1), Blue Green (1), and Agate (2).

Blades (*n*=45)

The definition employed for the identification of blades from the Penitentiary Branch site is as follows: "A specialized elongated flake with parallel to sub-parallel lateral edges; its length equal to at least twice its width. Cross- or transverse-section may be either plano-convex, triangular, subtriangular, rectangular, often trapezoidal, and on the dorsal face, one or more longitudinal crests or ridges" (Crabtree 1968:1).

Additional variables were employed for the accurate identification of blades from this assemblage, which includes more than 300 bifacial thinning flakes that exhibit parallel to sub-parallel lateral edges. Consequently, criteria included:

1) Length greater than width
2) Parallel to sub-parallel lateral edges
3) Cross-section of one or two longitudinal ridges on dorsal surface
4) Two or more dorsal scars reflecting uni-directional removals
5) Platform preparation reflecting reduction or abrasion to facilitate blade removal
6) Platform angle less than 90°
7) Bulb of applied force

Figure 41. Limestone digging implements.

Ultimately, analysis identified 45 blades manufactured from Blue-Gray Tan (40; 1 heat), Tan Porcelaneous (1), Dark Blue-Gray Tan (3), Chalcedony (1). In cross-section approximately 84 percent (*n*=36) of the blades are triangulate; the remaining 16 percent are trapezoidal. Blade termination consists of outrepassé, feather, hinger, and step. Only one blade displays retouch which is manifested on the lower portion of both lateral edges and the distal end. Twelve other blades are utilized (Cridlebaugh 1978). Although no blade cores were identified, their absence may be a product of failure to recognize exhausted blade cores. The blades may not represent a blade industry at Penitentiary Branch, but their quantity and quality indicate intentional manufacture. A full accounting of blade attributes is presented in Appendix L.

Utilized Flakes (*n*=110)

This artifact category includes 110 decortication, bifacial thinning, or shatter flakes which exhibit irregular or continuous fine flake removals on one or more edges indicative of edge utilization. Raw Materia types present include Blue-Gray Tan (72), Dark Blue-Gray Tan (16), Blue-Gray Tan Fossiliferous (1), Blue-Gray Oolitic (2), Tan-Gray Green (1), Gray-Tan Mottled (1), Light Gray (3), Gray (4), Dark Gray (2), Black (3), Gray Banded (3), Chalcedony (1), and Agate (1).

Debitage (*n*=11,342)[20]

Debitage recovered from Penitentiary Branch site features was selected for analysis. The decision to analyze this sample was based on the fact that method of field recovery was consistent for all features whereas it varied somewhat for excavation units. The majority of features were associated with Stratum C. Appendix M categorizes and quantifies the 11,342 bifacial thinning flakes, decortications flakes, flat flakes, shatter flakes, core fragments, modified nodules, and modified module fragments.

Raw material is predominantly Fort Payne chert and identical to the chert types described in this chapter. The categories quantified in Appendix M are the product of stone implement manufacture. Bifacial thinning flakes were separated into two size classifications since the large (>3 cm) flakes comprise a great proportion of the sample and they also represent evidence of primary stage of lithic manufacture (blanks and preforms) at the site.

Ground Stone Implements

Grooved Axe (*n*=12)

Seven fully grooved limestone axes were recovered from Levels 2, 3, 4, and 10 at the Penitentiary Branch site (Figure 42). These tools were manufactured by pecking and then grinding the artifact. On observable specimens, the proximal end is flattened on both lateral edges and the butt (*n*=1) or the lateral edges are rounded and the butt flat (*n*=2). Distal end bits which are not broken display polish and one specimen exhibits apparent bifacial flake resharpening removals. Five additional fragments of a ground stone axe, probably grooved, were recovered from Feature 8.

Hammerstones (*n*=16)

Sixteen hammerstones, displaying batter and/or grinding on one or more surfaces, were recovered from the excavations (Figure 43b and c). Raw material types included Blue-Gray Tan

[20] This total is incorrectly given as 16,610 in the original report.

Cobble (8), Blue-Gray Tan Modified Nodule (1), Unidentified Chert Nodule (3,) Chalcedony Cobble (1), Chalcedony Cobble Fragment (1), Limestone Cobble (2), and Sandstone Cobble (1).

<u>Pitted Cobble</u> (*n*=1)

A single pitted cobble or nutting stone was recovered. This thick and flat fine-grained sandstone slab is characterized by nine pits on one surface and seven on the opposing side; pit diameters average 37; the specimen was from Level 2, Stratum C.

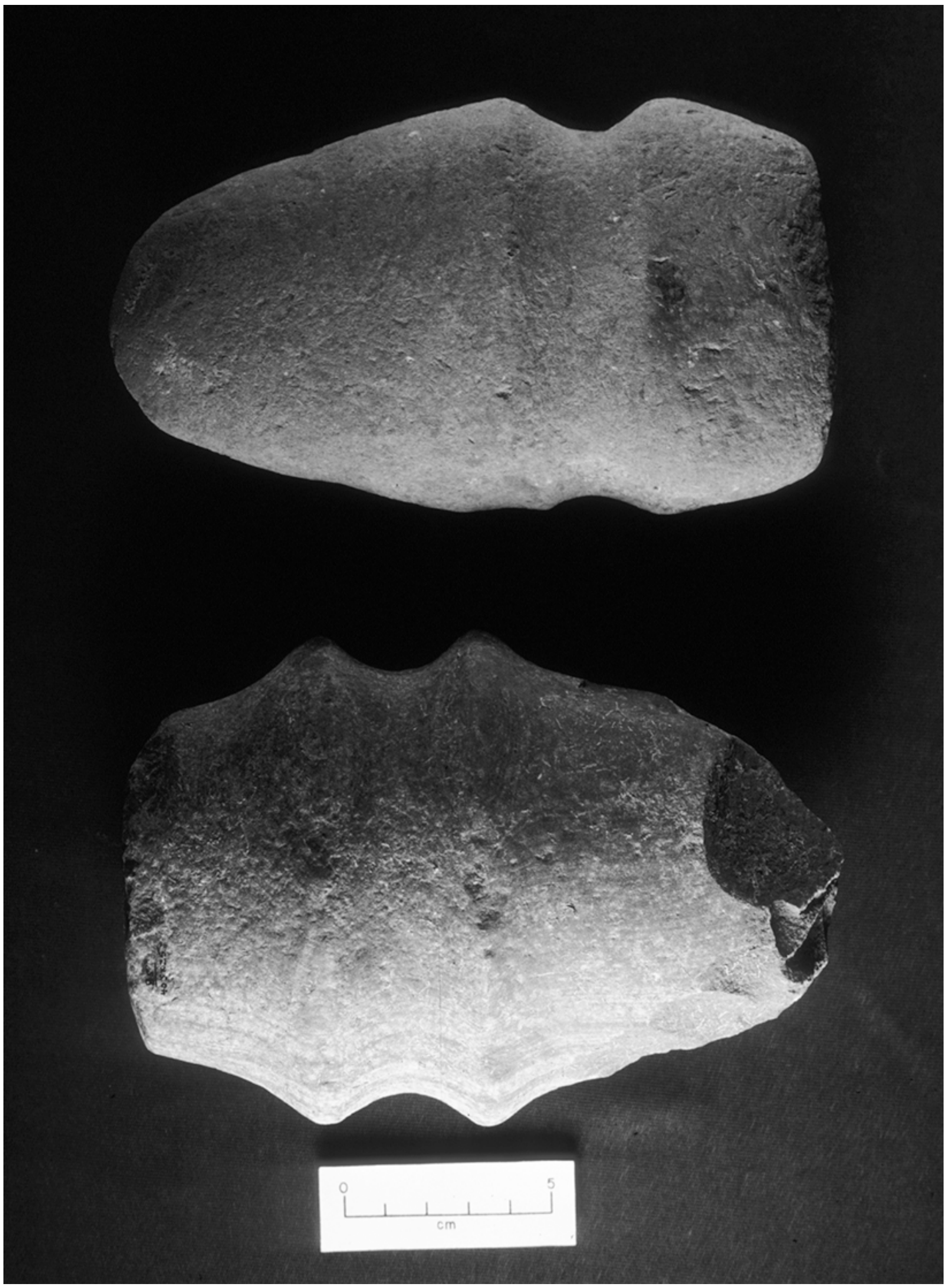

Figure 42. Fully grooved axes.

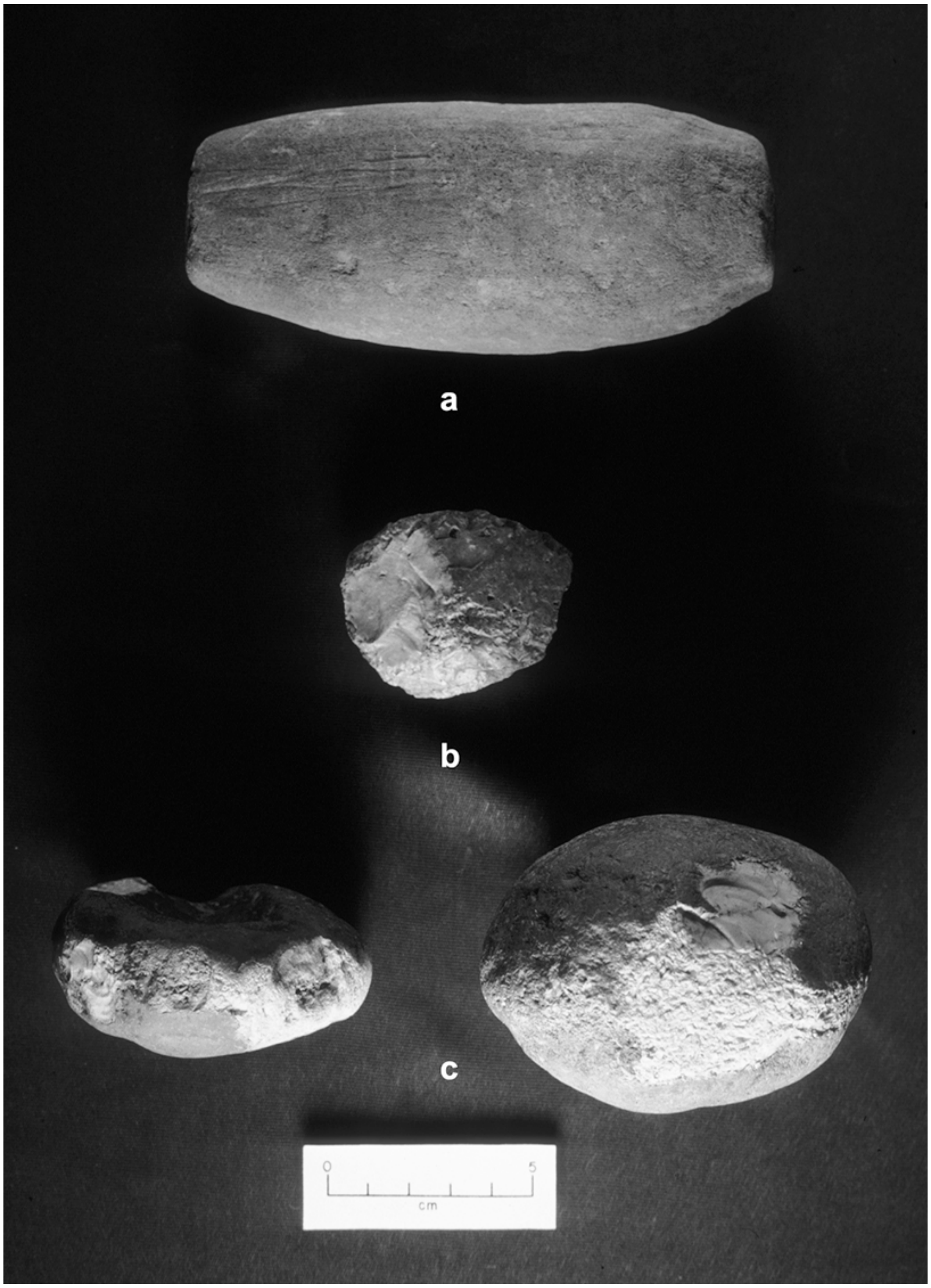

Figure 43. Ground stone implements: a. Tubular pipe blank; b-c. Hammerstones

Abraded Cobble (*n*=1)

Excavations recovered a single naturally shaped, triangular and flat, fine-grained sandstone cobble which has been abraded. The cortex has been abraded or ground away from both surfaces inward leaving a portion of the center surface on both sides unabraded. The three lateral edges are flat and two corners are also heavily worked.

Ground Stone Gorget (*n*=1)

The lithic assemblage included a single amorphously shaped limestone gorget with one drilled hole (Figure 44a). The lateral edge nearest hold is shaped and flattened, while the opposing edge is unmodified. The hole has been drilled from both the ventral and dorsal surfaces.

Ground Stone Bead (*n*=1)

A fine-grained limestone bead, ground and drilled, was recovered from Feature 22, which also contained Woodland ceramics (Figure 44b). The hole is drilled from both sides, and is less than 0.5 mm wide at the center.

Boatstone (*n*=1)

A portion of a ground and polished unfinished limestone boatstone was recovered from Feature 11 (Figure 44c). It is plano-covex in shape with a wide groove on the ventral surface and tapered, rounded end.

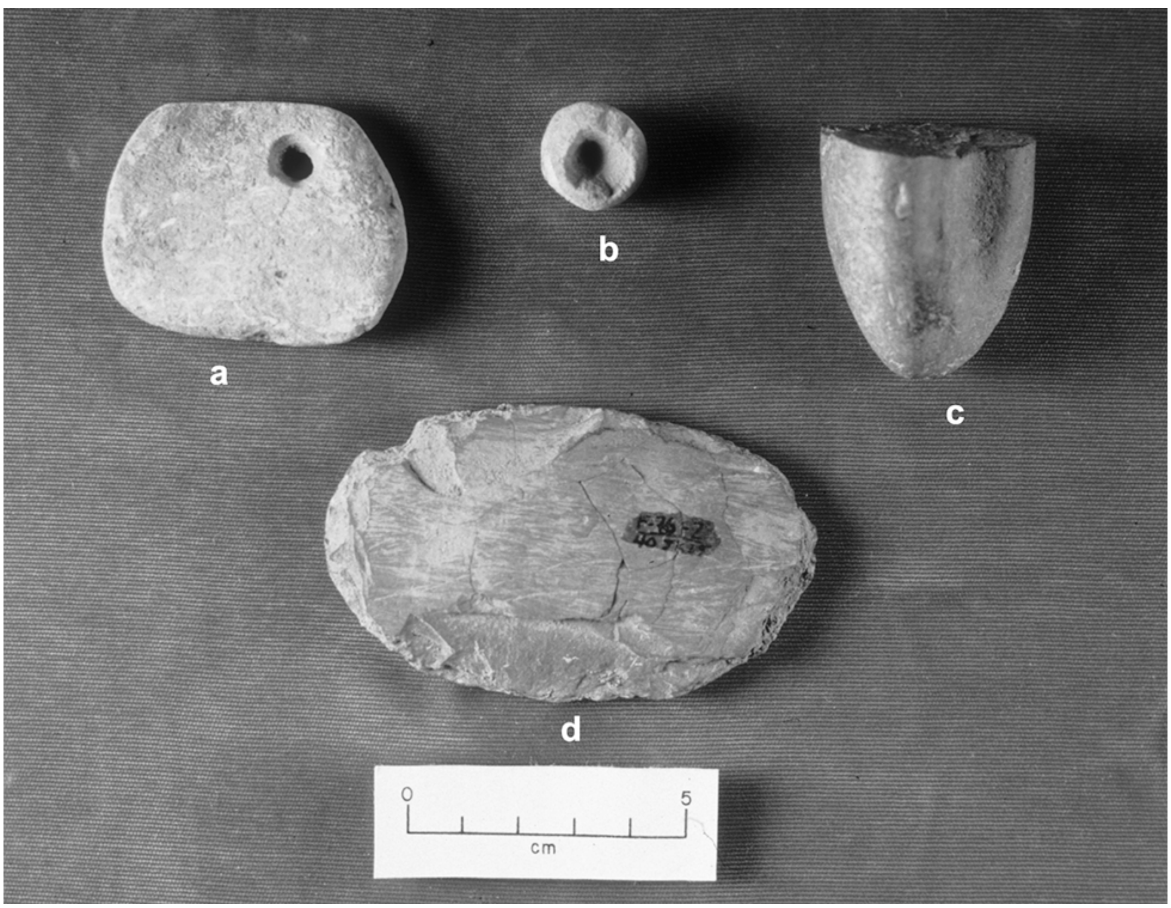

Figure 44. Ground stone implements: a. Gorget; b. Bead; c. Boatstone; d. Shale gorget blank.

Tubular Pipe Blank (*n*=1)

This elongated, rounded fine-grained limestone artifact exhibits tapered ends and basal flattening (Figure 43a). It was manufactured through a combination of pecking and grinding, and manufacturing striations extend along the length of object. This is probably a tubular pipe blank which was abandoned due to the breakage of a large flake from one side.

Gorget (?) Blanks (*n*=3)

These artifacts consist of oval (*n*=2) and roughly rectangular (*n*=1) shale (Figure 44d) showing bifacial flake removals from the lateral edges. Incomplete grinding and polish is present on surfaces and edges of one example, and grinding and polish on the surface of another; while no modification beyond bifacial flake removals is visible on the third.

Ground Stone Fragment (*n*=1)

This smoothed ground and polished shale fragment did not fit readily within any of the artifact categories described above.

Summary and Interpretation

The lithic reduction sequence at the Penitentiary Branch site encompassed the reduction of unprepared nodules and/or blocks. Data are too imprecise to establish whether the primary sequence for the manufacture of completed bifacial implements was from primary bifacial blanks and preforms or core reduction flakes subsequently bifacially altered. That the manufacture of bifacial implements from primary bifacial blanks and preforms was a relatively important aspect of the manufacturing technology, however, is suggested by the following evidence:

a) Bifacial blanks lack ventral surfaces and flake striking platforms.

b) Bifacial blanks are predominantly large biconvex masses of raw material.

c) Bifacial blanks exhibiting cortex on two surfaces comprise 26.2 percent (n=37) of the sample; blanks retaining cortex on one or more surfaces comprise 69.8 percent (n=99) of the sample.

d) The ratio of cores to blanks is 1:2.2 and cores to blanks and preforms, 1:5.

Fabrication of chipped stone implements was primarily by direct percussion with a hammerstone, billet, and abrader. Although few hammerstones were recovered from the site, numerous antler billets comprise the faunal inventory. Debitage, especially large thinning flakes, and flake scars on the lithic specimens, indicate direct percussion was employed at all stages of manufacture. Completed implements exhibit intermittent pressure flaking scars along the lateral edges or periphery and working edges. Hinging and step fractures are also highly characteristic of the manufacturing technique; moreover, hinging commonly resulted in knots. This was both a product of the manufacturing technique as well as the properties of the raw material.

Both the debitage and artifact specimens indicate the primary raw material utilized in the chipped stone lithic technology at Penitentiary Branch was locally available Fort Payne blue-gray tan chert, or a probable variation of that category. Excluding bifacial fragments and debitage, 82.1 percent (*n*=793) of the chipped stone assemblage was manufactured of this material. This includes 90.9 percent (*n*=60) of the cores; 83.1 percent (*n*=118) of blanks; 80.8 percent (*n*=160) of preforms; 80.6 percent (*n*=237) of projectile points/knives; and 82.0 percent (*n*=218) of other chipped stone implements. Of the total chipped and ground stone assemblage (excluding fragments N+998) 20.5 percent (*n*=205) of the specimens are comprised of other cherts such as dark gray, black, gray banded, and blue green as well as vein quartz, chalcedony, agate, limestone, shale, and sandstone.

Fort Payne chert is characterized by fossiliferous inclusions and fissures. An unavoidable consequence of the combination of direct percussion and inclusions in the matrix of this medium-grained chert was hinging and knotting which resulted in somewhat crudely manufactured implements. Although thermal alteration facilitates and improves the flaking quality of Fort Payne blue-gray and tan and fossiliferous cherts (Hood and McCollough 1976:195–215), heat treatment of lithic material at Penitentiary Branch was rare. With the exclusion of bifacial fragments and utilized flakes, the total number of specimens exhibiting thermal alteration is 97, or 12 percent of the sample. A breakdown of specimens within each classification indicates 3 percent (*n*=2) of the cores display heat treatment; 0.7 percent of blanks (*n*=1); 14.6 percent of preforms (*n*=29); 19.7 percent of projectile points/knives (*n*=58); and 9.2 percent of other chipped stone implements, (*n*=7). Thermal treatment seems to increase as stages of preform reduction advance. Out of the total sample (*n*=810, treated and untreated) under consideration, 3.6 percent of the thermally altered artifacts are preforms and an increase is evidenced by 7.2 percent projectile point stage implements. The increase in the thermal alteration of projectile points versus preforms and earlier manufacturing stages may reflect intentional alteration; however, accidental exposure of the projectiles to heat in such areas as hearths and cooking ovens cannot be discounted. In addition, Faulkner and McCollough (1973:53) and Penny and McCollough (1976:152) have suggested that blue-gray and tan Fort Payne chert occurs in natural pink beds which may have been altered by forest fire.

The Penitentiary Branch chipped stone lithic assemblage was comprised primarily of bifacial implements with unifacial implements apparently being of less importance. With the exclusion of cores, debitage and bifacial fragments, bifaces encompass 77.9 percent (*n*=703) of the chipped stone assemblage, while unifaces account for an additional 22.1 percent (*n*=199). If only completed and utilized implements are considered, 64.6 percent (*n*=363) are bifacial and 35.4 percent (*n*=199) are unifacial implements.

Finally, although approximately 97 percent of the lithic assemblage is composed of chipped stone artifacts, the remaining 3 percent consists of ground stone artifacts. Most prevalent are hammerstones and grooved axes; less prevalent are personal and/or ceremonial items. Fully grooved axes and other ground and polished artifacts were formed by pecking and/or minor flaking a blank/preform and subsequently grinding the object into its desired final form. Raw materials were limestone, shale, chert and sandstone.

Viewed as a whole, this chipped and ground stone assemblage suggests lithic implements were manufactured from unprepared nodules and prepared blanks at the Penitentiary Branch site. The manufacturing technique was primarily direct percussion and abrasion resulting in the production of bifacial, unifacial, and ground stone implements useful for food and fiber procurement and processing.

XI. PREHISTORIC CERAMICS

Six fragments of limestone-tempered ceramics less than 12 mm in diameter were recovered from feature fill and general excavation levels. Four badly leached and eroded limestone-tempered residual sherds were recorded from Feature 22, a large deep (1.28 m) midden-filled pit. These Woodland period ceramic fragments, recovered from the upper fill, but below an upper sand cap, possibly represent a Woodland period storage pit. A fifth such sherd was recovered from Level 3 of Unit 127R203 and may be interpreted as intrusive into the Late Archaic midden. Finally, one limestone-tempered Bluff Creek Simple Stamped sherd was intrusive into Level 2, Unit 127R203. These data suggest use of the Penitentiary Branch site during the Woodland period was isolated and temporary since no additional artifacts and features were clearly diagnostic of that period.

XII. EURO-AMERICAN SETTLEMENT

Few written accounts of early exploration into the Cumberland River Valley of Middle Tennessee are extant. French traders were in the region as early as 1710, and by 1715 a trading post was established in the present-day Nashville area. The Treaty of Paris and end of the French and Indian War in 1763 opened the way for English exploration and American settlement of the region. One of the first historic accounts of the region was recorded by Thomas Hutchins in 1768. Hutchins surveyed the Cumberland River from its mouth to near present-day Nashville, Tennessee. Although no journal of this exploration exists, survey notes and maps provide some information of the territory and specifically of the area within close proximity to the Penitentiary Branch site. Hutchins notes a 15 m-deep spring with indigo-colored water (Williams 1928:210; 221–226). That locale is situated approximately eight km southwest of the Penitentiary Branch site, and is currently known as Blue Spring.

A decade after Hutchins' survey, the fervor for land led to settlement by the Transylvania Company. Claims on the territory by the Shawnee, Chickasaw, and Cherokee did not preclude determination by members of the Transylvania Company to establish Euro-American settlements. Consequently, by 1780 several hundred settlements had been established along the Cumberland River from Virginia to Fort Nashborough. Fort Blount was constructed in 1794 on the south side of the Cumberland River in present-day Jackson County, Tennessee, 19.3 km southwest of the Penitentiary Branch site, and intended to protect Euro-American settlers in that area.[21] Thomas Dillon visited Fort Blount in 1796 and found it to be protected by approximately 15 men who were poorly supplied with provisions (Williams 1928:360). In 1797 Louis Phillipe visited the area and found Fort Blount about to be rebuilt, following an Indian attack, and a countryside which appeared famine-stricken (Williams 1928:438).

By the turn of the century, the Euro-American population in the Nashville region had expanded considerably, although in the Fort Blount area it was apparently not as intensive. In 1799 Steiner and Schweinitz (Williams 1928) journeyed along the Fort Blount road, crossed Flin's Creek (Flynn Creek, southern Jackson County) numerous times, and arrived at Fort Blount. They note that the countryside was broken and the soil rather poor. In two day's travel in the area, Steiner and Schweinitz mention two houses in addition to Fort Blount, which no longer was marked by a garrison but simply by a large house (Williams 1928:505–506).

The Penitentiary Branch Site

There is little evidence of Historic period occupation and utilization of the immediate Penitentiary Branch site area. Chimney remains from a late nineteenth century house are

[21] See Smith and Nance (2000) for further information on Fort Blount.

located approximately 305 m south of the prehistoric site. Local informants indicate the Late Archaic site area was utilized as a garden by residents of that property as late as 1940. At the time of the salvage excavations, the site was in pasture with two twentieth century outbuildings located to the west of the shell midden. Historic material cultural remains recovered during excavations of the plowzone at Penitentiary Branch, therefore, provide useful data pertaining to early historic settlement. These materials are listed below in Table 2.

Table 2. Historic artifacts recovered from the Penitentiary Branch site

Artifact		**Count**
Ceramics		
Earthenware Fragments		
Underglaze blue painted pearlware (bowl) (Figure 45a)		2
Blue shell-edge pearlware (Figure 45b)		1
Blue painted pearlware (Figure 45d)		1
Relief decorated edgeware pearlware		1
Underglaze polychrome painted pearlware		6
Pearlware		7
Green shell-edge creamware		1
Blue shell-edge creamware (Figure 52c)		2
Creamware		17
Polychrome painted white earthenware		1
Stoneware Fragments		
Lead-glazed stoneware		3
Salt-glazed stoneware		2
Red stoneware		1
	Total	45
Tobacco Pipes		
Stub-stemmed pipes (Figure 45 e)		2
	Total	2
Glass		
Amber Bottle or jar glass fragments		2
Light green Bottle or jar glass fragments		1
Clear Bottle or jar glass fragments		6
	Total	9
Metal		
Two-tined metal fork; one tine broken; no handle		1
Machine cut nails		30
Wire nails		5
Spike		1
Screw		1
U-shaped wire staple		1
Barbed Wire		2
Other Wire Fragments		2
Horseshoe Fragments		2
Tin handle or fitting		1
Other unidentified metal		4
	Total	50
	Grand Total	**106**

Discussion

The manufacture of underglaze blue painted pearlware (c. 1780–1820; median 1800), blue shell-edge pearlware (c. 1780–1830; median 1805) (South 1977:212), blue painted pearlware (c. 1795–1840; median 1818), relief decorated edgeware pearlware (c. 1800–1820; median 1810), and underglaze polychrome painted pearlware (1820–1840; median 1830) suggests Euro-American occupation at Penitentiary Branch as early as 1780. Stub-stemmed pipes date from 1810–1820; two-tined metal forks date from the late 1700s, and machine cut nails after 1830 (median c. 1890).

On the basis of all the ceramic, glass, and metal specimens, the most probable early date for Euro-American settlement within the immediate site locale would have c. 1830–1840. Despite the readily available water resources at Penitentiary Branch, an additional set of factors which would argue against early permanent Euro-American settlement pertains to the paucity of good agricultural soils and a topography poorly suited for residential sites.

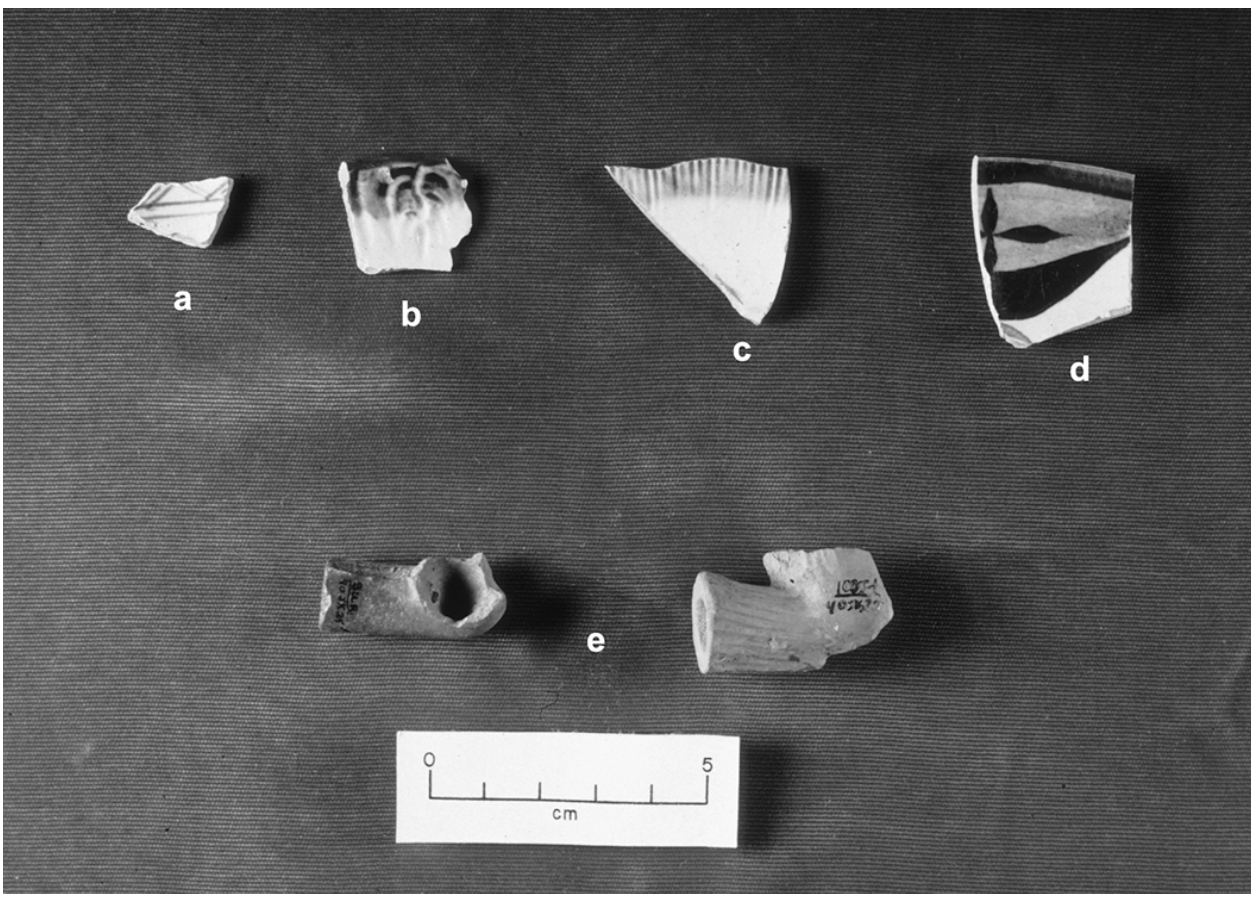

Figure 45. Historic ceramic and pipe remains: a. Underglaze blue painted pearlware; b. Blue shell-edge pearlware; c. Shell-edge creamware; d. Blue painted pearlware; e. Stub-stemmed pipes.

XIII. LATE ARCHAIC SETTLEMENT AND SUBSISTENCE AT PENITENTIARY BRANCH

Prehistoric cultural deposits in the Upper Cumberland River Valley have been identified primarily along the Cumberland River and its tributaries. Survey data (Ball 1979; Morse 1963; Polhemus 1963; Tennessee State Site Files) indicate Late Archaic period sites were typically situated on the floodplain or lower terraces at the confluence of streams with the Cumberland River, on tributary floodplains from the confluence to approximately 3 km upstream, and on lower terraces and knolls adjacent to the Cumberland River. Of 16 Late Archaic period sites identified in Jackson County, Tennessee, only 25 percent (*n*=4; 40JK2, 40JK10, 40JK21, and 40JK25) are shell middens. One of these, 40JK21, was located approximately 1.8 km upstream from the Penitentiary Branch site at the Hamilton Branch-Cumberland River confluence.

The Penitentiary Branch (40JK25) and Robinson Shell Mound (40SM4) sites represent the only Late Archaic period components extensively investigated in the Cumberland River Valley. Robinson is located 86 meandering river kilometers downstream from Penitentiary Branch in Smith County, Tennessee. The two sites are comparable as both were Late Archaic shell middens situated in the Upper Cumberland River Valley[22] on erosional colluvium of nearby bluffs adjacent to the Cumberland River. At the Robinson site a "mountainous" (Morse 1967:8) bluff rose 38 m to the north of the site and at Penitentiary Branch a bluff rose 130 m to the west. Physiographically, the two sites were similarly located; Robinson was on the Eastern Highland Rim at its interface with the outer Nashville Basin and Penitentiary Branch was the reverse.

A comparison of the bivalve and gastropod shell density at Penitentiary Branch and Robinson sites cannot be achieved accurately since quantitative determinations of midden content such as those performed by Cook and Treganza (1947, 1956) were not conducted at either site, and no photographs of Robinson site profiles are available for examination. A 5—10 cm-thick layer of loam with a "large concentration of shell and broken limestone" (Morse 1967:12) and sparse shell in other thicker layers suggests shell density at Robinson was much less extensive than at Penitentiary Branch, where 1.5 m of stratified midden consisted of three layers comprised of more than 60 percent shell, and six other layers made up of 20—35 percent shell.

The density of whole and fragmentary shell within the Penitentiary Branch midden made it difficult to identify the point of origin for cultural features. Nevertheless, 134 features, four postholes, and 17 burials were excavated. Intensive occupation or reoccupation of the site

[22] The use of "Upper Cumberland" reflects geologic divisions of the Cumberland River watershed. From an archaeological perspective, both sites fall within the Archaic shell-bearing tradition of the Middle Cumberland River Valley (Peres and Deter-Wolf 2016).

area is indicated by approximately 63 percent (*n*=84) of the features which were intrusive or superimposed into another. Features consisted of large round to oval straight to sloping walled and primarily flat based pits, basins, and depressions, and were subcategorized on the basis of fill. Of the sample, 39.6 percent (*n*=53) were midden filled pits and basins; 30.6 percent (*n*=41), rock filled/lined pits and basins; 12.7 percent (*n*=17), rock and shell filled pits and basins; 9.7 percent (*n*=13), shell filled pits and basins; 3.7 percent (*n*=5), depressions; 2.2 percent (*n*=3) fired clay deposits; and 0.7 percent (*n*=1), linear disturbances and tree fall/stumps.

The fired clay deposits along with concentrations of charcoal, ash, and fire-oxidized clay likely functioned as hearths. At least a portion of the rock filled/lined pits and basins are presumed to have functioned as earth ovens while other pits and basins were storage and refuse containers. While the majority (approximately 75 percent) of these features were concentrated in a 12x12 m-area, no discrete activity areas were discerned. Although Penitentiary Branch pits and basins were apparently similar to pits and earth ovens excavated at the Robinson site, a major dissimilarity was the presence of bell-shaped pits and fired clay floors at Robinson. Such clay areas or platforms have been reported from additional Late Archaic sites including the Banks site along the Duck River (Faulkner and McCollough 1974:201), the Higgs site in the lower Tennessee River Valley (McCollough and Faulkner 1973:58–59), Mulberry Creek in northern Alabama (Webb and DeJarnette 1942:238), Indian Knoll on the Green River in Kentucky (Webb 1946:241), and the Robeson Hills site in the Wabash River Valley of Illinois (Winters 1969:91). These features, often associated with postholes, are interpreted as prepared clay occupation/habitation areas.

Identification of only four shallow postholes at the Penitentiary Branch site precludes any definition of structures. The hypothesis that partial posthole patterns represent complete archaeological remains of simple structures (Faulkner and McCollough 1974:207–211, Webb 1946:242) seems a more plausible explanation of the posthole patterns at the Robinson site than Morse's (1967:14) interpretation, and may be inferred for other late spring to early autumn Upper Cumberland River Valley sites such as Penitentiary Branch.

The 17 Penitentiary Branch site human inhumations, interred within and intruded upon by pit and basin features, were clustered within a probable cemetery area. The inhumations of men, women, and children exhibited flexed body positions, an absence of grave goods, and shallow to indiscernible burial depressions, but otherwise were not characterized by any coherent mortuary patterning. Similar Indian Knoll burials for which there was no visible pit were assumed to have been placed on the midden surface or within a shallow depression and covered with shell-filled midden (Webb 1946:245). The typical burial placement at the Robinson site, where 62 inhumations were investigated, was within a vertical-walled and flat-based circular pit (Morse 1967:122). That site also exhibited definite association of grave goods with seven individuals, including whelk shell gorgets or beads interred with five inhumations and which provide evidence of participation in an exchange network (c.f. Goad 1980:1–16).

While two domestic dog (*Canis familiaris*) burials were excavated at the Robinson site, no such recoveries were made at Penitentiary Branch. Dog bones, were, however, identified from three levels with a minimum number of individuals (MNI) estimated at three. The 11 elements exhibited no butchering marks, thereby suggesting a non-food use of the animals.

The recovery, identification, and analysis of 27,208 specimens of vertebrate and invertebrate remains from Penitentiary Branch presents a major contribution to Late Archaic period studies. The primary meat sources of site occupants were white-tailed deer, elk, and bear; other mammals such as bobcat, skunk, mink, raccoon, gray fox, porcupine, beaver, gray squirrel, woodchuck, rabbit, and opossum provided less than 10 percent of the meat. The large quantity of bivalve shell remains indicate this invertebrate resource provided an important supplemental food source at 3.5 percent of the total meat yield.[23] Interpretation of faunal remains by their stratigraphic occurrence indicates temporal fluctuations in the importance of species. During the earliest occupation of the site, elk was utilized more than deer; later deer was a primary meat source; and at other times deer, elk, and bear were heavily exploited. By the latter stages of site occupation, deer and mussels were apparently most extensively procured.

According to Breitburg's butchering strategies analysis, deer were processed for the removal of the hide, to deflesh elements, and to disarticulate the carcass in order to obtain the head, sections of the neck and thoracic body as well as the forequarter and hind-quarter. Deer antler and bones and bones of birds (turkey), raccoon, and turtle were used in the manufacture of bone implements. Manufacturing debris exhibits a variety of techniques including scoring around the circumference of the shaft followed by snapping, a semi-circular incision terminating in a V-shaped cut, hacking the circumference of the shaft to separate the desired portion(s), scoring, whittling, abrasion, and polishing.

Table 3, an activity index, assigns bone implements to specific activity categories. Deer antler was utilized extensively in the manufacture of implements for stone fabrication or processing. Items necessary for this activity included long-handled chert-working implements, antler tines, antler drifts, and hammers. Bone fishhooks and projectile points were used in food procurement activities, while bone end scrapers, awls, and needles were important for the processing of hides and possibly fiber items. Bone beads, pendants, pins, cups, and bowls are classified as personal items and a bone dangle as a recreational item which may have been used in the pin-and-cup game. The incised decorated bone handle and incised turtle shell may have been associated with ceremonial or utilitarian activities. This assemblage was similar to that recovered from the Robinson site; however, a mussel shell pendant, perforated carnivore canines, and a cut human femur were identified from that Late Archaic component.

Local lithic resources, predominantly consisting of Fort Payne chert, provided raw material for the manufacture of chipped and ground stone artifacts. The chipped stone implement assemblage was comprised of cores, blanks, preforms, projectile points/knives, knives, scrapers, drills, perforators, gravers, chisels, adzes, notched flakes and bifaces, bifaces,

---

[23] The use of meat yield to measure the relative importance of freshwater shellfish at Archaic shell-bearing sites in the Middle Cumberland River Valley has recently been called into question (Peres and Deter-Wolf 2013).

utilized flakes, blades, and debitage. Table 3 indicates the activities in which these implements were employed. Projectile point categories are overall quite similar to types from the Robinson site, and include: side notched; side notched, incurvate base; corner removed, asymmetrical blade; and corner removed/notched, expanded stem groups. Several projectile point categories correlate well with named types diagnostic of the Late Archaic period in the Middle South. Of the 294 projectile points, 19 percent (*n*=56) are referable to the Big Sandy type or Upper Valley Side Notched, while 13.16 percent (*n*=40) may be variants or a late form of that tradition. Additionally, 21.8 percent (*n*=64) specimens are referable to a Ledbetter, Benton, and Cotaco Creek group, while 27.6 percent (*n*=81) are identifiable as Motley, Wade, and Robinson types.

In comparison to the large projectile point assemblage, the remainder of the chipped stone implement assemblage was neither extensive in terms of implement category or quantity. Drills, knives, scrapers, perforators, and chipped limestone digging tools were the most numerous of these artifacts. With the inclusion of ground stone artifacts such as fully grooved axes and hammerstones, the implication of the total bone and stone assemblage is for an emphasis on utilitarian activities involving implement manufacture and food procurement, and processing and fabrication of plant and animal byproducts (Table 3). Certainly, the 142 lithic blanks and 198 preforms as well as the large metric diameter of primary and bifacial thinning flakes are indications that stone tool fabrication was an important activity at the Penitentiary Branch site.

Quantities of paleobotanical remains recovered from the Penitentiary Branch site cannot be used to determine the importance of plant food horticulture, gathering, and processing, although the species represented are indicators of the importance of such activities. Possible cultigens (cultivars) such as goosefoot, maygrass, pigweed, knotweed, and the cultigen squash are presented in the sample. Both cultivars and cultigens were quite important in the Late Archaic subsistence economy, as demonstrated by the recovery of such plant remains as sunflower, squash, and gourd from Late Archaic sites in eastern North America (c.f., Chapman 1981; Chomko and Crawford 1978; Cowan 1981; Crawford 1982; McCollough and Faulkner 1973; Marquardt and Watson 1976). Such plant data establish the basis for Cleland's (1976) Late Diffuse model of Late Archaic period exploitation strategies.

The Penitentiary Branch paleobotanical data is an important contribution to the Cumberland River Valley paleoethnobotanical record. Wood charcoal was collected but unidentified from the Robinson site excavations with the exception of 11.8 percent gm of hickory and acorn shell. Consequently, the Penitentiary Branch material represents, to date, the only identified carbonized wood, nutshell, and fruit and seed assemblage from a Late Archaic period site in the region. Carbonized nutshell comprised four arboreal species, while wood comprised 22 species, and fruits and seeds 17 taxa (15 non-arboreal taxa). In descending order, the most extensively utilized woods were ash, oak, and honey locus while nut resources were hickory, walnut, and acorn. Predominant cultivars and cultigens were goosefoot, squash, knotweed, and asteraceae. Cucurbit remains have been identified from the lower Little Tennessee River Valley Bacon Bend site dated 4390 BP (Chapman 1981:3940), the Pomme de Terre River Valley, Missouri Phillips Spring site c. 4257 BP (Kay et al. 1980), the Green River

Valley Carlston Annis site c. 4030 BP (Crawford 1982:208; Marquardt and Watson 1976), the northeastern Kentucky Cloudsplitter Rockshelter c. 3700 BP (Cowan 1981), the lower Little Tennessee River Valley Iddins site c. 3655 BP and 3250 BP (Chapman 1981:129); and the Green River Bowles and Peter Cave sites, c. 3440 BP and 3415 BP (Crawford 1982:208). The Penitentiary Branch cucurbits, c. 3375 BP, fill a geographical gap in the archaeological record and provide additional evidence of plant food cultivation at Late Archaic period shell midden sites. It is interesting to note that plant food assemblages at the Green River Valley and Cumberland River Valley shell midden sites differ. Chenopods and maygrass, absent at the Green River sites (Crawford 1982:213), were present at the Penitentiary Branch site, while sumpweed (*Iva annua*) was not identified in either case.

Table 3. Activity index for artifacts from Penitentiary Branch.

Activity Category	**Implement Category**
Implement Manufacture	
Wood Fabrication/Processing	Notched flakes, notched bifaces, utilized flakes, chopping implements, axes, adzes, chisels
Bone Fabrication/Processing	Notched flakes, notched bifaces, gravers, drills, denticulates, utilized flakes, abraders, hammerstones
Stone Fabrication/Processing	Hammerstones, cores, abraders, drills, antler tines, long-handler antler chert-working implements, antler drifts or hammers (baton)
Food Procurement (Foraging)	
Hunting	Chert projectile points/knives, bone projectile points
Fishing	Bone fishhooks, bone projectile points
Plant Food Horticulture	Digging implements, cobble choppers, knives, blades, utilized flakes
Animal Processing/Fabrication	
Butchering	Knives, cobble choppers, blades, utilized flakes
Hide Processing	Chipped stone scrapers, knives, blades, perforators, gravers, utilized flakes; bone end scrapers, awls, needles
Plant Food and Fiber Processing	Knives, scrapers, notched flakes/bifaces, utilized flakes, pitted cobbles (nutting stone), hammerstones
Domestic Construction (Structures, Storage, and Earth Ovens)	Digging implements, axes, adzes
Personal	Stone and bone beads, stone gorgets, bone pendants/charms, bone pins, bone cups and bowls
Recreational	Bone dangle (pin and cup)
Ceremonial	Pipe blank, boatstone, incised/decorated bone
Burials	Digging implements

The plant remains assemblage at the Penitentiary Branch site indicates cultigens plant food production occurred at least as early as 3375 BP with procurement of local domesticated and wild plant foods. Bottomland, lower mesic terraces, xeric upland and disturbed land plant taxa were exploited. Based upon the evidence of carbonized wood and fruit and seed remains, primary exploitation was of bottomland and lower mesic terrace taxa. The small percentage of disturbance favored taxa points to the interpretation that land use in the vicinity of the site had not been sufficient to encourage their growth during the occupation of the site.

Subsistence and Settlement: Interpretations

Robinson site subsistence and settlement interpretations (Morse 1967) are anchored in Morse's Deer Yarding Hypothesis (Morse 1967:247–258) which is based on the supposition that deer yarded during Late Archaic period winters in the Middle South. The hypothesis is questionable since there is no analogy for the occurrence of deer yarding during historic times in the south (Waselkov 1978:23; Morse 1967:158). It has been suggested that it is misleading to use the modern situation as a basis for reconstructing prehistoric environmental conditions–particularly in as dynamic a setting as a floodplain (Yerkes 1981:214).

This subsistence and settlement model assumes that large concentrations of deer yarded in protected valleys during each winter. As a consequence, Late Archaic period people established winter "villages" in the protected valley near the deer yarding locale in order to optimally exploit their primary food source, white-tailed deer. Presumably the major factors involved in the selection of the village included availability of the shoals as a place to cross the river, as an area of good fishing and shellfishing, protection against the elements, protection against enemies, and availability of deer (Morse 1967:253–254).

Finally, Morse's model concludes that shell midden sites represented winter occupations and that "shellfish consumption was restricted to winter villages" (Morse 1967:296). Morse views shellfish as a supplemental or back-up food resource available for consumption if deer were unavailable or the yarding mechanism failed to occur. By itself, Morse's interpretation of shellfish as a supplemental meat food recalls analyses by Parmalee and Klippel (1974), who provide convincing data that bivalves were a supplemental or famine food for prehistoric subsistence economies. Conversely, acceptance of the Deer Yarding Hypothesis implies deer drives or other intensive exploitative hunting techniques. It is expected that if deer did yard in the Upper Cumberland River Valley, they were both numerous and easily exploited, thereby reducing the probability that a supplemental or back-up animal food such as freshwater shellfish was necessary during the winter.

Rather, it might be hypothesized that early spring would have been the most feasible time for large-scale inclusion of supplemental shellfish in the diet. It has been proposed that this would represent the most probable famine period since stored foods (i.e., nuts and dried fruits and seeds) utilized during the winter would have depleted. Moreover, new spring plant growth, for the procurement of greens and tubers, would have not occurred yet, and many animals would still be in hibernation.

Other Late Archaic subsistence and settlement models have been proposed by Cleland (1976), Dye (1977), and Bowan (1977). Dye incorporates Cleland's (1976:70) Late Archaic diffuse exploitation strategy model of multiple resource scheduling. While I do not concur with all aspects of Dye's model for the Western Middle Tennessee Valley, such proposals as Late Archaic adaption to a variety of animal and plant resources (Dye 1977:75) and the spring to fall cultivation and collection of domesticated and wild plants and shellfish (Dye 1977:70–73) are applicable to the activities at the Penitentiary Branch site. Although no data are available for upland Late Archaic period sites in the Cumberland Valley, Bowan's (1977:116) proposed model

(Western Tennessee Valley) for summer settlement and subsistence is applicable to the Penitentiary Branch site: it was a floodplain base camp where activities included hunting, fishing, wild and domesticated plant procurement, mussel collection, and related activities (see Table 3).

No artifacts indicative of exchange/trading activities were recovered from the Penitentiary Brach site. Morse (1967) suggested this was an activity which occurred at winter shell midden occupation sites. The absence of exotic items such as marine shell or copper may be the product of sampling error, site location, or cultural factors rather than specific seasonality for trading. Moreover, the Penitentiary Branch site may exemplify the Kay et al. (1980) down-the-line exchange hypothesis. If cucurbits were not established cultigens at the Penitentiary Branch site by 3400 BP and were, in fact, a product of down-the-line exchange, this Upper Cumberland River Valley Late Archaic period site may have been have a beneficiary of down-the-line exchange rather than directional exchange (Kay et al. 1980:820).

The combination of artifact and feature data collected from the Penitentiary Branch site, with emphasis upon the faunal and paleobotanical data, form the basis for subsistence and settlement interpretations of the site. Penitentiary Branch was a base encampment where primary activities were large mammal hunting, wild and domesticated plant collection, shellfish/fish collection, and stone and bone implement fabrication. As demonstrated by the inhumations, the individuals who participated in these activities were children, women, and men for whom there is no archaeological evidence of traumatic death. The death of one female can, however, be attributed to pregnancy complications. The adult population suffered from osteoarthritic involvement and extensive tooth wear and loss.

Site occupation was probably a product of seasonal scheduling for the procurement of deer, elk, bear, and mussels, and a variety of plant foods. Deer, elk, and turkey were exploited from the forest margins; bear, from the upper woodlands; and shellfish, fish, and turtles, from the aquatic habitats. Plant foods were derived from bottomland, forest margin, and upland habitats. It is presumed the site was occupied from spring to late autumn or a portion of that time. Interpretation of this occupation season is based on the following data:

1) The presence of fetal and newborn deer remains.

2) The presence of blackberry (*Rubus* spp.), cucurbit, nut, and other summer to late autumn plant remains.

3) The presence of deer antler and tool manufacture which suggests occupation continued into the late autumn.

4) The presence of woodchuck, a species which begins hibernation in late autumn, elements suggests procurement of the animal from May through October.

5) The large quantity of mussel remains which probably would have been procured most easily during summer and fall.

6) The absence of migratory birds argues against winter occupation.

An additional non-archaeological factor which argues against winter occupation of the site is the topography/physiography of the locale. The modern (AD 1976) ground cover and arboreal vegetation at the Penitentiary Branch site was not synonymous with the prehistoric vegetation; therefore, the modern site probably was more exposed than the prehistoric. The bluff which rose 130 m to the west of the site was present during the Late Archaic period occupation, however. By mid-October, AD 1976, this bluff obscured the sun and cast a shadow over the occupation area from early afternoon (approximately 2:30–3:00 p.m.) until sunset. The declination of the sun in addition to the exposure of the site at the confluence of a small stream and major river resulted in an extremely unprotected, cold environment. The factor and the above archaeological data provide strong evidence for non-winter occupation.

In conclusion, while the Deer Yarding Hypothesis may be applicable to the Robinson site, the Penitentiary Branch site faunal and botanical data indicate that hypothesis is not suitable for this occupation. Most obviously, shell middens are not automatically indicative of Late Archaic period winter occupations. Penitentiary Branch provides an alternative archaeological example of subsistence and settlement in the Upper Cumberland River Valley in contrast to the Robinson site.

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APPENDIX A: SUBSURFACE DISTURBANCES

Feature	Category	Diameter (m)	Depth (m)	Unit	Level
1	Basin	1.1 x (Int0.)	0.28	133R203	4
2	Basin	0.80 x 0.61	0.30	133R203	3
3	Pit	1.40 x 0.95	0.88	127R203	4
4	Pit	1.95 x 1.80	0.69	127R203/200	4
5	Pit	1.20 x 1.00	0.35	127R203	
6	Basin	0.90 x 0.80	0.19	133R203	4
7	Basin	0.96 x 0.86	0.09	133R200	4
8	Tree Fall/Stump	2.50 x 1.85	0.45	130R203	4
9	Pit	0.95 x (Int0.)	0.30	133R200	¾
10	Fired Clay Deposit	0.45 x 0.35+	0.05 (Basin) 0.19	133R197	¾
11	Basin	1.95 x 2.05+	0.26	133R197	3
12	Pit	2.00 x 2.55	?	136R230	3+
13	Pit	1.38 x 1.30	1.84	127R200	4
14	Pit	0.91 x 0.80	0.58	133R197	4
15	Basin	0.82 x 0.72	0.25	124R203	4
16	Pit	0.60 x (Int0.)	0.45	124R203	4
17	Pit	1.20 x 0.82+	0.41	133R194	¾
18	Basin	1.00 x 1.00	0.14	130R200	4
19	Depression	1.15 x 0.92	0.10	130R200	4
20	Basin	0.90 x 0.70	0.11	130R200	4
21	Fired Clay Deposit	0.45 x 0.50	0.05	136R224	4
22	Pit	2.45 x 1.80	1.28	124R200	4
23	Linear Disturbance	1.80 x 0.40–1.00	0.66	124R200	4
24	Pit	1.25 x 0.90	1.65	133R230	7
25	Pit	1.75 x 1.75	0.50	133R224	3
26	Pit	0.69 x 0.68	0.29	133R224	3
27	Pit	1.95 x (Int0.)	0.71	139R230	10
28	Pit	0.95 x 0.96	0.34	130R224	3
29	Basin	0.76 x 1.04	0.24	130R224	3
30	Basin	0.55 x 0.50	0.05	130R224	2/3
31	Pit	1.65 x (Int0.)	0.39	121R200	3
32	Basin	0.59 x 0.64	0.06	133R221	3
33	Pit	1.50 x (Int0.)	0.50	124R230	2
34	Basin	1.40 x (Int0.)	0.25	130R221	2
35	Pit	0.90 x 0.84	0.56	130R221	2
36	Pit	0.90 x 1.20	0.30	130R221	2
37	Basin	0.70 x 0.80	0.19	124R221	2
38	Pit	0.95 x 0.85	0.34	124R221	2
39	Depression	1.17 x 0.87	0.17	124R221	2
40	Pit	1.18 x 0.90	0.72	124R221	2
41	Fired Clay Deposit	0.95 x 0.57+	0.03	124R227	2
42A	Pit	0.92 x 0.85	0.28	124R227	2
42B	Basin	0.60 x 0.54	0.11	124R227	3
43A	Pit	1.20 x 1.17	0.30	124R227	3
43B	Basin	0.85 x 0.93+	0.08	124R227	2
44	Basin	0.25 x 0.23	0.10	124R221	2
45	Basin	0.85 x 0.70+	0.12	124R230	2
46	Pit	0.80 x 0.85	0.22	124R221	2
47	Pit	1.18 x 0.95	0.47	124R230	2
48	Basin	0.50 x 0.43	0.06	124R227	3

Feature	Category	Diameter (m)	Depth (m)	Unit	Level
49	Pit	0.74 x 0.80+	0.27	121R221	3
50	Pit	1.40 x (Int0.)	0.49	121R221	2
51	Pit	0.50+ x 0.90+	0.34	121R221	2
52A	Pit	0.95 x 1.12	0.39	127R221	2
52B	Pit	0.98 x 0.65+	0.29	127R221	2
53	Pit	1.45 x 1.00	0.40	121R221	2
54	Pit	1.04 x 1.00	0.77	127R221	2
55	Pit	0.75 x 1.20+	0.60	127R221	2
56	Pit	0.95 x 0.65+	0.62	127R221	2
57	Pit	0.72 x 0.84	0.42	127R221	2
58	Basin	0.60 x 0.55	0.27	127R221	2
59	Pit	0.87 x 0.87	0.63	121R221	2
60	Pit	1.05 x 0.73	0.49	127R224	2
61	Basin	0.85 x 0.78	0.29	127R221	2
62	Basin	0.63 x 0.43	0.20	124/127R221	2
63	Pit	1.28 x 0.50+	0.80	127R221	2
64	Pit	0.86 x 0.78	0.37	127R221	2
65	Basin	0.85 x 0.90	0.10	124R230	3
66	Basin	0.72 x 0.66	0.19	124R221	2
67	Pit	0.78 x 0.72	0.46	121R221	2/3
68	Depression	0.71 x 0.45	0.11	124/127R221	2
69	Pit	0.78 x 0.80	0.26	124R230	3
70	Basin	0.53 x 0.55+	0.11	121R221	2
71	Basin	0.80 x 0.80	20	121/124R224	2
72	Basin	0.55+ x 0.45+	0.23	127R224	2
73	Pit	1.05 x 0.89	0.37	124R224	2
74	Basin	0.85 x 0.70	0.12	124R224	2
75	Pit	1.05 x 0.75	0.33	124R224	2
76	Pit	0.52 x 0.92	0.41	124R224	2
77	Pit	1.00 x 1.30	0.32	124R224	2
78	Basin	0.40+ x 0.50+	0.09	121R221	2
79	Pit	2.00 x 0.90	0.44	121R224	2
80	Basin	0.45 x 0.45	0.10	127R224	2
81	Pit	1.25 x 0.85	0.37	121R224	2
82	Pit	1.10 x Int0.	0.45	121R224	2
83	Basin	0.98 x (Int0.)	0.20	121R224	2
84	Basin	0.42 x 0.41	0.22	121R224	2
85	Pit	0.85 x 0.76	0.54	127R221	2
86	Pit	0.52+ x 0.40+	0.29	127R224	2
87A	Basin	0.50+ x 0.40+	0.19	127R224	2
87B	Basin	0.40+ x 0.40+	0.23	127R224	2
88	Basin	0.58 x 0.50	0.24	127R224	2
89	Basin	0.70 x 0.65	0.26	127R224	2
90	Pit	1.05 x 1.00+	0.50	127R224	2
91	Pit	0.98 x 0.85+	0.55	127R224	2
92	Pit	0.78 x 0.75+	0.20	121R221	2
93	Basin	0.72+ x 0.63	0.25	121R221	2
94	Pit	1.45 x 1.25	0.90	121R224	2
95	Basin	0.65 x 0.90	0.18	121R224	2
96	Basin	0.90 x 0.85	0.17	124R224	2
97	Basin	0.50 x 0.45	0.08	121R224	2
98	Pit	0.63 x 0.81	0.68	124R224	2
99	Basin	0.70 x 0.80	0.19	127R221	2
100	Pit	0.85 x 0.90	0.65	124R224	2
101	Basin	0.40+ x 0.50+	0.08	127R224	2
102	Pit	1.16 x 1.39	0.37	121R227	2
103	Pit	0.94 x 0.87	0.35	121R230	2

Feature	Category	Diameter (m)	Depth (m)	Unit	Level
104	Pit	0.85 x 0.80+	0.35	124R224	2
105	Basin	0.58 x 0.50+	0.08	124R221/224	2
106	Basin	0.90 x 0.71	0.21	124R221/221	2
107	Pit	1.30 x 1.25	0.29	121R227	2
108	Pit	1.00 x 0.85+	0.35	121R230	2
109	Pit	0.79 x 0.78	0.35	121R230	2
110	Pit	0.90 x 0.89	0.53	112R224	2
111	Basin	0.90 x 0.75	0.25	118R224	2
112	*(not assigned)*				
113	Pit	0.87 x 0.95	0.48	118R230	2
114	Pit	1.02 x 0.94+	0.61	121R230	2
115	Basin	0.90 x 0.60+	0.21	121R227	2
116	Basin	0.53 x 0.31+	0.26	118R227	2
117	Pit	0.80 x 0.75	0.35	118R224/227	2
118	Pit	0.97 x 0.85	0.43	112/115R224	2
119	Pit	0.60+ x 0.60	0.47	127R227	2
120	Depression	0.90 x 0.55	0.20	127R227	2
121	Basin	0.65+ x 0.45+	0.18	115R224	2
122	Pit	0.80 x 0.65	0.28	118R224/227	2
123	Basin	1.35 x 1.00	0.12	115R224	2
124	Pit	1.10 x 1.05	0.78	115R224	2
125	Basin	0.95 x 0.55+	0.11	118R224	2
126	Basin	0.90+ x 0.80	0.20	118R224	2
127	Pit	0.83 x 1.05	0.55	118R230	2
128	Basin	1.04 x 0.90	0.23	121R227	2
129	Pit	1.00 x 0.95	1.30	118R224	2
130	Pit	1.45 x 1.81	0.35	115R224	2
131	Depression	1.05 x 0.90	0.12	118R230	2

APPENDIX B:
FEATURE DATA BY CATEGORY

Fired Clay Deposits

Feature	Diameter (m)	Thickness (m)
10	0.45 x 0.35+ (Int.)	0.05 (Fired area)
		0.19 (Fire basin)
21	0.45 x 0.50	0.05
41	0.95 x 0.57+ (Int.)	0.03
Range:	0.45–0.95 x 0.35–0.57	
Mean	0.6 x 0.05 (3)	0.08 (3)
SD	0.29 x 0.11 (3)	0.07 (3)

Midden Filled Pits

Feature	Diameter (m)	Depth (m)
4	1.95 x 1.80	0.69
13	1.38 x 1.30	1.84
22	2.45 x 1.80	1.28
24	1.25 x 0.90	1.65
25	1.75 x 1.75	0.50
26	0.69 x 0.68	0.29
31	1.65 x (Int.)	0.39
40	1.18 x 0.90	0.72
42A	0.92 x 0.85	0.28
49	0.74 x 0.80+ (Int.)	0.27
51	0.50 x 0.90+ (Int.)	0.34
54	1.04 x 1.00	0.77
55	0.75+ x 1.20+ (Int.)	0.60
57	0.72 x 0.84	0.42
60	1.05 x 0.73	0.49
63	1.28 x 0.50+	0.80
64	0.86 x 0.78	0.37
67	0.78 x 0.72	0.46
73	1.05 x 0.89	0.37
75	1.05 x 0.75	0.33
76	0.52 x 0.92	0.41
77	1.00+ x 1.30	0.32
81	1.25 x 0.85	0.37
92	0.78 x 0.75+	0.20 (-0.30) Burial -13
100	0.85 x 0.90	0.65
108	1.00 x 0.85+	0.35
109	0.79 x 0.78	0.35
113	0.87 x 0.95	0.48
117	0.80 x 0.75	0.35
118	0.97 x 0.85	0.43
Feature	**Diameter (m)**	**Depth (m)**
127	0.83 x 1.05	0.55
129	1.00 x .95	1.30
Range:	0.50–2.45 x 0.50–1.80	0.20–1.84
Mean:	1.05 (32) x 0.97 (31)	0.58 (32)
SD	0.42 (32) x 0.32 (31)	0.40 (32)

Rock-Lined Pits

Feature	Diameter (m)	Depth (m)
12	2.00 x 2.55	?
14	0.91 x 0.80	0.58
17	1.20 x .82+	0.41
27	1.956 x (Int.)	0.71
35	0.90 x 0.84	0.56
36	0.90 x 1.20	0.30
43A	1.20 x 1.17	0.30
47	1.18 x .95	0.47
50	1.40 x (Int.)	0.49
53	1.45 x 1.00	0.40
56	0.95 x 65+	0.62
59	0.87 x 0.87	0.63
79	2.00 x 0.90	0.44
82	1.10 x (Int.)	0.45
85	0.85 x /76	0.54
86	0.52 x 40+	0.29
90	1.05 x 1.00+	0.50
91	0.98 x 0.85+	0.55
94	1.45 x 1.25	0.90
102	1.16 x 1.39	0.37
103	0.94 x 0.87	0.35
104	0.85 x 0.80+	0.35
114	1.02 x 0.94+	0.61
124	1.10 x 1.05	0.78
130	1.45 x 1.81	0.35
Range:	0.52–2.0 x 0.40–2.55	0.29– 0.90
Mean:	1.2 (25) x 1.0 (22)	0.50 (24)
SD:	0.38 (25) x 0.44 (22)	0.16 (24)

Rock and Shell Filled Pits

Feature	Diameter (m)	Depth (m)
16	0.60 x (Int.)	0.45
28	0.95 x 0.96	0.34
33	1.50 x Int.	0.50
38	0.95 x 0.85	0.34
46	0.80 x 0.85	0.22
52A	0.95 x 1.12	0.39
52B	0.98 x 0.65+	0.29
98	0.63 x 0.81	0.68
107	1.30 x 1.25	0.29
119	0.60 x 0.60+	0.47
122	0.80 x 0.65	0.28
69	0.78 x 0.80	0.26
Range:	0.60–1.50 x 0.60–1.25	0.22– 0.68
Mean:	0.90 (12) x 0.85 (10)	0.38 (12)
SD:	0.27 (12) x 0.21 (10)	0.13 (12)

Shell-Filled Pits

Feature	Diameter (m)	Depth (m)
3	1.40 x .95	0.88
5	1.20 x 1.00	0.35
9	0.95 x Int.	0.30
110	0.90 x 0.89	0.53
Range	0.90–1.40 x 0.89–1.00	0.30–0.88

Mean:	1.11 (4) x .95 (4)	0.52 (4)
SD:	0.20 (4) x 0.05 (3)	0.23 (4)

Midden-filled Basins

Feature	Diameter (m)	Depth (m)
30	0.55 x 0.50	0.05
32	0.59 x 0.64	0.06
37	0.70 x 0.80	0.19
42B	0.60 x 0.54	0.11
43B	0.85 x 0.93+	0.08
71	0.80 x 0.80	0.20
74	0.85 x 0.70	0.12
80	0.45 x 0.45	0.10
84	0.42 x 0.41	0.22
87A	0.50+ x 0.40+	0.19
87B	0.40+ x 0.40+	0.23
88	0.58 x 0.50	0.24
89	0.70 x 0.65	0.26
96	0.90 x 0.85+	0.17
99	0.70 x 0.80	0.19
101	0.40+ x 0.50+	0.08
106	0.90 x 0.71	0.21
111	0.90 x 0.75	0.25
115	0.90 x 0.60+	0.21
116	0.53 x 0.31+	0.26
125	0.95 x 0.55+	0.11
Range:	0.40– 0.95 x 0.31–0.93	0.05– 0.26
Mean:	0.76 (16) x 0.69 (15)	0.18 (16)
SD:	0.22 (16) x 0.21 (15)	0.07 (16)

Rock Filled/Lined Basins

Feature	Diameter (m)	Depth (m)
29	0.76 x 1.04	0.24
45	0.86 x 0.70+	0.12
48	0.50 x 0.43	0.06
58	0.60 x 0.55	0.27
61	0.85 x 0.78	0.29
62	0.63 x 0.43	0.20
65	0.85 x 0.90	0.10
66	0.72 x 0.66	0.19
70	0.53 x 0.55+	0.11
83	0.98 x Int.	0.20
93	0.72+ x 0.63	0.25
95	0.65 x 0.90	0.18
97	0.50 x 0.45+	0.08
121	0.65+ x 0.45+	0.18
123	1.35 x 1.00	0.12
128	1.04 x 0.90	0.23
Range:	0.50–1.35 x 0.43–1.04	0.06– 0.29
Mean:	0.076 (16) x 0.69 (15)	0.18 (16)
SD:	0.22 (16) x 0.21 (15)	0.07 (16)

Shell and Limestone Filled Basins

Feature	Diameter (m)	Depth (m)
34	1.40 x Int.	0.25
44	0.25 x 0.23	0.10
78	0.40+ x 0.50+	0.09
105	0.58 x 0.50+	0.08
126	0.90+ x 0.80	0.20
Range:	0.25–1.40 x .23– 0.80	0.08– 0.25
Mean:	0.71 (5) x 0.51 (4)	0.14 (5)
SD:	0.46 (5) x 0.23 (4)	0.08 (5)

Shell Filled Basins

Feature	Diameter (m)	Depth (m)
1	1.10 x Int.	0.28
2	0.80 x 0.61	0.30
6	0.90 x 0.80	0.19
7	0.96+ x 0.80	0.09
11	1.95 x 2.05+	0.26
15	0.82 x 0.72	0.25
18	1.00 x 1.00	0.14
20	0.90 x 0.70	0.11
72	0.55+ x 0.45+	0.23
Range:	0.55–1.95 x 0.45–2.05	0.09–0.28
Mean:	0.89 (9) x 0.89 (8)	0.21 (9)
SD:	0.49 (9) x 0.49 (8)	0.08 (9)

Depressions

Feature	Diameter (m)	Depth (m)
19	1.15 x 0.92	0.10
39	1.17 x 0.87	0.17
68	0.71 x 0.45	0.11
120	0.90 x 0.55	0.20
131	1.05 x .90	0.12
Mean:	0.80 (5) x 0.74 (5)	0.14 (5)
SD:	0.40 (5) x 0.22 (5)	0.04 (5)

Postholes

Posthole	Unit	Diameter (m)	Depth (m)
1	133R224	0.25 x 0.25	0.13
2	130R224	0.18 x 0.21	0.09
3	127R224 (F-64)	0.18 x 0.20	0.08
4	121R224	0.23 x 0.23	0.10

APPENDIX C:
METRIC ATTRIBUTES FOR HUMAN SKELETAL REMAINS

Burial 1

<u>Left radius</u>	
Maximum length	253.0 mm
<u>Right humerus</u>	
Maximum length	318.0 mm
Maximum diameter mid-shaft	24.4 mm
Minimum diameter mid-shaft	18.0 mm
Vertical diameter head	45.2 mm
Transverse diameter head	42.0 mm
Circumference of mid-shaft	66.2 mm
<u>Left femur</u>	
Maximum diameter	450.0 mm
A-P mid-shaft diameter	27.5 mm
M-L mid-shaft diameter	24.8 mm
Circumference of mid-shaft	78.0 mm
Maximum diameter of head	42.3 mm
Subtrochanteric A-P diameter	22.0 mm
Subtrochanteric M-L diameter	33.0 mm

Burial 2

<u>Right femur</u>	
Maximum diameter of head	37.0 mm

Burial 3

<u>Left humerus</u>	
Diaphysis length	147.5 mm

Burial 4

<u>Right radius</u>	
Length	233.0 mm
<u>Femur</u>	
Femoral head diameter	44.0 mm

Burial 5

<u>Cranium</u>	
Glabello-occipital	186.0 mm
Maximum width	138.0 mm
Basion-bregma	138.0 mm
Basion-nasion	107.0 mm
<u>Mandible</u>	
Mandibular symphysis height	34.0 mm
Mandibular body height	31.0 mm
Mandibular body length	86.5 mm
Mandibular body thickness	13.0 mm
Mandibular ramus height	62.0 mm

Burial 5 (continued)

Maximum ramus breadth	48.0 mm
Minimum ramus breadth	39.4 mm
Bigonial diameter	111.0 mm
Bicondylar breadth	125.5 mm
Gonial angle	111°
<u>Left clavicle</u>	142.0 mm
<u>Left humerus</u>	
Maximum length	326.0 mm
Head diameter	42.3 mm
Maximum diameter mid-shaft	20.5 mm
Minimum diameter mid-shaft	20.3 mm
Least circumference of shaft	72.0 mm
<u>Right femur</u>	
Maximum length	449.0 mm
A-P diameter mid-shaft	28.6 mm
M-L diameter mid-shaft	25.2 mm
Circumference of mid-shaft	86.0 mm
A-P diameter (subtrochantric)	26.1 mm
M-L diameter (subtrochantic)	27.3 mm
Femoral head diameter	45.1 mm

Burial 6

<u>Cranium</u>	
Glabello-occipital length	181.0 mm
Glabello-occipital width	139.5 mm
Basion–bregma height	137.0 mm
Basion-nasion	95.0 mm
Maximum bizgomatic diameter	131.5 mm
Prosthion-nasion	@60.0 mm
Basion-prosthion	@94.0 mm
Mandibular symphysis height	33.5 mm
Mandibular body height	35.1 mm
Mandibular body length	76.0 mm
Mandibular body thickness	13.0 mm
Bicondylar diameter	@97.0 mm
Gonial angle	@97°
<u>Right ulna</u>	
Maximum length	259.0 mm
<u>Right radius</u>	
Maximum length	241.0 mm
<u>Left femur</u>	
Maximum length	423.0 mm
A-P mid-shaft diameter	24.0 mm
M-L mid-shaft diameter	23.6 mm
Subtrochantric A-P diameter	29.0 mm
Subtrochantric M-L diameter	26.8 mm
Maximum diameter of head	38.0 mm
Circumference of mid-shaft	75.0 mm
<u>Left Clavicle</u>	137.5 mm

Burial 7

<u>Left ulna</u>	226.0 mm

Burial 8

Poor preservation; no metric attributes recorded

Burial 9

<u>Cranium</u>	
Glabello-occipital length	183.0 mm
Glabello-occipital width	139.0 mm
Maximum bizygomatic breadth	132.8 mm
Prosthion-nasion	70.5 mm
Nasal breadth	25.7 mm
<u>Mandible</u>	
Mandibular symphysis height	28.7 mm
Mandibular body height	25.5 mm
Mandibular body length	74.0 mm
Mandibular body thickness	14.0 mm
Mandibular ramus height	57.0 mm
Ramus maximum breadth	40.1 mm
Ramus Minimum breadth	33.1 mm
Bigonial diameter	96.3 mm
Bicondylar breadth	126.5 mm
Gonial angle	119°
<u>Left humerus</u>	
Maximum length	294.0 mm
Maximum diameter of mid-shaft	18.4 mm
Minimum diameter of mid-shaft	12.4 mm
Maximum diameter of head	36.9 mm
Least circumference of shaft	48.0 mm
<u>Right radius</u>	
Maximum length	223.0 mm
<u>Right femur</u>	
Maximum length	415.0 mm
A-P diameter of mid-shaft	21.2 mm
M-L diameter of mid-shaft	23.0 mm
Subtrochantric A-P diameter	29.1 mm
Subtrochantric M-L diameter	20.2 mm
Maximum diameter femoral head	37.4 mm
Circumference of mid-shaft	71.0 mm
<u>Metrics Fetal</u>	
Two humeri shafts (left)	29.9 mm and 27.7 mm
Two femora diaphysis	23.5 mm and 24.9 mm

Burial 10

<u>Cranium</u>	
Glabello-occipital length	189.0 mm
Glabello-occipital width	134.0 mm
Basion-bregma height	142.0 mm
Bason-nasion	101.0 mm
Basion-prosthion	100.1 mm
Maximum bizygomatic breadth	139.6 mm
Nasal breadth	26.4 mm
<u>Mandible</u>	
Mandibular symphysis height	41.5 mm
Mandibular body height	34.9 mm
Mandibular body length	77.0 mm
Mandibular body thickness	14.5 mm
Mandibular ramus height	64.0 mm

Ramus maximum breadth	40.9 mm
Ramus minimum breadth	36.3 mm
Bigonial breadth	110.7 mm
Bicondylar breadth	131.2 mm
Gonial angle	115.5°
<u>Left humerus</u>	
Maximum length	331.0 mm
Maximum diameter of mid-shaft	23.6 mm
Minimum diameter of mid-shaft	17.4 mm
Maximum diameter of head	45.5 mm
Least circumference of shaft	65.0 mm
<u>Left ulna</u>	
Maximum length	271.0 mm
<u>Right radius</u>	
Maximum length	257.0 mm
<u>Right femur</u>	
Maximum length	441.0 mm
A-P diameter of mid-shaft	29.2 mm
M-L diameter of mid-shaft	24.6 mm
Subtrochantric A-P diameter	24.4 mm
Subtrochantric M-L diameter	31.8 mm
Maximum diameter of head	42.7 mm
Circumference of mid-shaft	85.0 mm
<u>Right tibia</u>	
Maximum length	441.0 mm
A-P diameter at nutrient foramen	35.9 mm
M-L diameter at nutrient foramen	26.0 mm

Burial 11

Right femur diaphysis	87.5 mm
Left ulna diaphysis	67.8 mm
Left radius diaphyseal length	58.6 mm

Burial 12

<u>Cranium</u>	
Glabello-occipital length	183.0 mm
Glabello-occipital width	131.0 mm
<u>Mandible</u>	
Mandibular symphysis height	27.6 mm
Mandibular body height	31.7 mm
Mandibular body length	78.0 mm
Mandibular body thickness	15.0 mm
Mandibular ramus height	53.0 mm
Ramus maximum breadth	45.4 mm
Ramus minimum breadth	35.0 mm
Bigonial diameter	100.0 mm
Bicondylar breadth	118.0 mm
Gonial angle	124°

Burial 13

<u>Cranium</u>	
Glabello-occipital length	162.0 mm
Glabello-occipital width	124.0 mm
Maximum bizygomatic diameter	129.0 mm
Basion-nasion	85.9 mm
<u>Left humerus diaphysis</u>	

Burial 13 (continued)

Maximum length	157.0 mm
Maximum diameter of mid-shaft	10.4 mm
Minimum diameter of mid-shaft	8.3 mm
<u>Left radius diaphysis</u>	
Maximum length	121.0 mm
<u>Right femur diaphysis</u>	
Maximum length	218.0 mm
A-P diameter mid-shaft	12.0 mm
M-L diameter of mid-shaft	12.5 mm
Subtrochantric M-L diameter	12.8 mm
Subtrochantric A-P diameter	12.1 mm
Maximum diameter of head	21.1 mm
Circumference of mid-shaft	39.0 mm
<u>Right tibia diaphysis</u>	
Maximum length	181.0 mm
A-P diameter at foramen	16.2 mm
M-L diameter at foramen	12.9 mm
<u>Right fibula</u>	
Maximum length	175.0 mm

Burial 14

<u>Cranium</u>	
Glabello-occipital length	176.0 mm
Glabello-occipital width	135.0 mm
Maximum bizygomatic diameter	131.0 mm
Prosthion-nasion	61.0 mm
<u>Mandible</u>	
Mandibular symphysis height	29.4 mm
Mandibular body height	23.6 mm
Mandibular body length	80.5 mm
Mandibular body thickness	14.8 mm
Mandibular ramus height	53.5 mm
Ramus maximum breadth	44.7 mm
Ramus minimum breadth	34.4 mm
Bigonial diameter	102.3 mm
Bicondylar breadth	128.5 mm
Gonial angle	116.5°
<u>Right clavicle</u>	
Maximum length	134.0 mm
<u>Left ulna</u>	
Maximum length	265.0 mm
<u>Left radius</u>	
Maximum length	253.0 mm
<u>Right femur</u>	
Maximum length	441.0 mm
A-P diameter mid-shaft	27.3 mm
M-L diameter mid-shaft	25.2 mm
Subtrochantric M-L diameter	26.1 mm
Subtrochantric A-P diameter	44.4 mm
Maximum diameter head	44.4 mm
Circumference of mid-shaft	80.0 mm

Burial 15

<u>Left ulna</u>	
Maximum length	246.0 mm

Burial 15 (continued)

<u>Femur</u>	
Femoral head diameter	38.9 mm
<u>Fragmented portions of femur</u>	
Length	390.0 mm

Burial 16

<u>Cranium</u>	
Glabello-occipital length	181.0 mm
Glabello-occipital width	142.0 mm
Maximum bizygomatic diameter	136.6 mm
Basion-bregma height	136.0 mm
Basion-nasion	103.0 mm
<u>Mandible</u>	
Mandibular symphysis height	34.1 mm
Mandibular body height	32.0 mm
Mandibular body length	87.0 mm
Mandibular body thickness	17.0 mm
Mandibular ramus height	61.0 mm
Ramus maximum breadth	44.0 mm
Ramus minimum breadth	37.2 mm
Bigonial diameter	104.1 mm
Bicondylar breadth	130.8 mm
Gonial angle	111°
<u>Left humerus</u>	
Maximum length	322.0 mm
Maximum diameter of mid-shaft	20.8 mm
Minimum diameter of mid-shaft	15.4 mm
Maximum diameter of head	41.9 mm
Least circumference of shaft	59.0 mm
<u>Left radius</u>	
Maximum length	256.0 mm
<u>Right tibia</u>	
Maximum length	@390.0 mm

Burial 17

Poor preservation; no metric attributes recorded.

APPENDIX D:
CARBONIZED WOOD BY COUNT, CATEGORIZED BY HABITAT

	Feature Number																						
TAXA	1	4	5	6	7	8	9	14	15	16	19	21	23	26	29	32	33	34	35	36	37	39	40
Acer sp.		1		1			1	7			1			7			3		4	5			
Arundinaria sp.												4							1				
Celtis occidentalis																	3						
Cercis canadensis			2																				
Diospyros virginiana															2								
Fraxinum sp.	2	4	7	2	7	2	2	16	11	5	12	7	5				12	3	4	5		1	17
Gleditsia triacanthos		2			3		3	6		1	3	4		5				1		2	6		9
Platanus occidentalis		2						1					1	2			2		1	1			
Salix sp.																							
Ulmus sp.							1												1	2			
Vitis sp.					2						1	3		5			1						
BOTTOMLAND SUBTOTAL	2	9	9	3	12	2	7	30	11	6	17	18	6	19	2	0	21	4	11	15	6	1	26
Fagus grandifolia				1					1	1								1					
Juglans sp.	1												1										
Liquidambar styraciflua																							
Oxydendrum arboreum																							
Prunus sp.	3			2		2		2	1				1					2	1	1			
Quercus (Red Group)	1		1	2		2	8	3			3			8	11	3	3	2	23	8	5	2	5
Quercus (White Group)	3			1					2	3	5	5			3				5				
Quercus sp.										1							1						
MESIC UPLAND SUBTOTAL	8	0	1	6	0	4	8	5	4	5	8	5	2	8	14	3	4	5	29	9	5	2	5
Carya sp.		2	7		2	1	2	1			1						3		4			1	8
Cornus florida		3	1		6			1		4		4		1					1		3		8
XERIC UPLAND SUBTOTAL		5	8		8	1	2	2	0	4	1	4	0	1	0	0	3	0	5	0	3	1	16
Carpinus caroliniana													1										
Pinus sp.	1																						
DISTURBED UPLAND SUBTOTAL	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Bark															5								
Diffuse Porous							1	1			2	2			1								1
Unidentifiable	15	1	10	3			7	15		4	8	15		5			23		20	10	6	5	
TOTAL	26	15	28	12	20	7	25	54	17	19	36	44	9	33	22	3	51	9	65	34	20	9	48

	Feature Number																						
	43	45	46	7	48	49	50	51	54	56	58	59	63	64	67	72	76	79	88	90	91	93	94
Acer sp.			2	2		1						2			3					2		2	1
Arundinaria sp.		3							2		1						3						1
Celtis occidentalis																						1	
Cercis canadensis																							
Diospyros virginiana																							
Fraxinum sp.	1	1						5	2	12			4		10	1	5	3	2	1	4	2	14
Gleditsia triacanthos			3	1	3	1		2	1	1	1	5	4	3	2	4	1	4		2			
Platanus occidentalis																				1			
Salix sp.									1														
Ulmus sp.			1	2			1																
Vitis sp.				1									2		1						1		
BOTTOMLAND SUBTOTAL	1	4	6	6	3	2	1	7	6	13	2	7	10	3	16	5	9	7	2	6	5	5	16
Fagus grandifolia	4	3	1										5										1
Juglans sp.																							
Liquidambar styraciflua																							
Oxydendrum arboreum																							
Prunus sp.			2						1					1		1							
Quercus (Red Group)	2	10	3	8		1	2	2	2		2	5	3	3		1	1	1	1	2		2	4
Quercus (White Group)																		3		1	1		
Quercus sp.																							
MESIC UPLAND SUBTOTAL	6	13	6	8	0	1	2	2	3	0	2	5	8	4	0	2	1	4	1	3	1	2	5
Carya sp.							2		1				2	1	1	3	5			3			
Cornus florida						2		3				1		3				6				1	
XERIC UPLAND SUBTOTAL	0	0	0	0	0	2	2	3	1	0	0	1	2	4	1	3	5	6	0	3	0	1	0
Carpinus caroliniana																							
Pinus sp.																							1
DISTURBED UPLAND SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Bark						3															20		
Diffuse Porous			2		1							1					1	1					
Unidentifiable	3	10		6	5	1		5	3			5	20	3	3	2	7	4	3	3		12	8
TOTAL	10	27	14	20	9	9	5	17	13	13	4	19	40	14	20	12	23	22	6	15	26	20	30

	Feature Number														
	102	103	105	106	108	111	113	116	117	118	120	124	127	127R197 L-3	103R203 L-3
Acer sp.		1			1	2	1					2	1		
Arundinaria sp.		4					1					1			
Celtis occidentalis															
Cercis canadensis															
Diospyros virginiana															
Fraxinum sp.	3	7	3		3	6	1		3	2	6	6	1	2	8
Gleditsia triacanthos				1			4	1		1	2	3	1	1	1
Platanus occidentalis															
Salix sp.															
Ulmus sp.							1								
Vitis sp.															
BOTTOMLAND SUBTOTAL	3	12	3	1	4	8	8	1	3	3	8	12	3	3	9
Fagus grandifolia		1													
Juglans sp.													1		
Liquidambar styraciflua															
Oxydendrum arboreum															
Prunus sp.			1				1		4				1		1
Quercus (Red Group)	3			1		6	2		3	7	2	1	6	4	1
Quercus (White Group)		2			1						2				
Quercus sp.			1												
MESIC UPLAND SUBTOTAL	3	3	2	1	1	6	3	0	7	7	4	1	8	4	2
Carya sp.	2		2		8	2	12	3	2				8	2	1
Cornus florida	1	1									2	1			
XERIC UPLAND SUBTOTAL	3	1	2	0	8	2	12	3	2	0	2	1	8	2	1
Carpinus caroliniana															
Pinus sp.	1						1								
DISTURBED UPLAND SUBTOTAL	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Bark															
Diffuse Porous											2	2			
Unidentifiable	4	3	1			10		10	4		3	10	4	2	6
TOTAL	14	19	8	2	13	26	24	14	16	10	19	26	23	12	18

	Feature Number								
	133R230 L-2	136R230 L-2	136R230 L-3	136R231 L-2	136R231 L-5	136R321 L-7	136R231 L-8	136R231 L-10	TOTAL
Acer sp.			5		1	4			64
Arundinaria sp.								1	25
Celtis occidentalis									4
Cercis canadensis									2
Diospyros virginiana									2
Fraxinum sp.	13	3	21	8	2	5	2	2	298
Gleditsia triacanthos	1	2	6	1	7	1	2	3	121
Platanus occidentalis	1								12
Salix sp.									1
Ulmus sp.			1						10
Vitis sp.	1				2				20
BOTTOMLAND SUBTOTAL	16	5	33	9	12	10	4	6	559
Fagus grandifolia			5				1		25
Juglans sp.								3	6
Liquidambar styraciflua							1		1
Oxydendrum arboreum					3				3
Prunus sp.	3		4				3		38
Quercus (Red Group)	6		12	1	6	4	2	5	217
Quercus (White Group)	2		1		2	1			43
Quercus sp.									3
MESIC UPLAND SUBTOTAL	11	0	22	1	11	6	7	8	336
Carya sp.	2		2		2	4	1		103
Cornus florida			5		2	1	1		62
XERIC UPLAND SUBTOTAL	2	0	7	0	4	5	2	0	165
Carpinus caroliniana			1						2
Pinus sp.								1	5
DISTURBED UPLAND SUBTOTAL	0	0	1	0	0	0	0	1	7
Bark									28
Diffuse Porous			6		1			1	26
Unidentifiable	28	4	29	1	10	5	30	10	424
TOTAL	57	9	98	11	38	25	43	26	1545

APPENDIX E:
CARBONIZED NUTSHELL BY GRAM WEIGHT, CATEGORIZED BY HABITAT

Feature	*Juglans cinerea*	*Juglans nigra*	*Juglans Sp.*	*Quercus Sp.*	MESIC UPLAND SUBTOTAL	*Carya Sp.*	TOTAL GRAM WEIGHT
1		0.076	0.012	--	0.088	0.152	0.240
4	--	--	--	0.005	0.005	0.197	0.202
5	0.067	0.113	0.143	--	0.323	2.673	2.996
6	--	0.055	--	--	0.055	0.270	0.325
7	0.043	0.273	--	0.010	0.326	0.969	1.295
8	--	--	0.140	0.009	0.149	0.823	0.972
9	--	--	0.058	--	0.058	0.083	0.141
14	--	0.235	--	0.156	0.391	0.968	1.359
15	--	--	0.067	0.014	0.081	0.140	0.221
16	--	--	0.124	0.086	0.210	0.719	0.929
19	--	0.229	0.063	0.071	0.363	1.230	1.593
21	0.079	0.876	0.367	0.090	1.412	4.918	6.330
23	--	--	--	--	--	0.044	0.044
26	--	0.038	--	0.038	0.076	0.280	0.356
29	--	--	--	0.063	0.063	0.216	0.279
32	--	0.036	--	--	0.036	0.922	0.958
33	--	--	0.051	0.087	0.138	0.922	1.060
34	--	--	--	0.006	0.006	0.163	0.169
35	0.080	0.014	--	0.193	0.287	0.316	0.603
36	--	0.051	--	0.010	0.061	0.419	0.480
37	--	0.140	0.246	0.010	0.396	0.579	0.975
39	--	0.167	0.176	0.010	0.353	0.665	1.018
40	0.262	0.493	--	0.021	0.776	1.171	1.947
43	--	0.264	0.042	0.014	0.320	0.385	0.705
45	--	0.308	--	0.011	0.319	0.348	0.667
46	--	0.326	0.314	--	0.640	1.037	1.677
47	0.034	0.060	--	0.019	0.113	0.379	0.492
48	--	0.045	0.025	0.049	0.119	0.111	0.230
49	--	0.054	--	--	0.054	0.181	0.235
50	--	--	--	0.008	0.008	0.216	0.224
51	--	--	0.012	0.019	0.031	0.375	0.406
54	0.064	0.119	--	0.012	0.195	0.208	0.403
56	--	0.111	--	0.027	0.138	0.124	0.262
58	--	--	--	--	--	0.018	0.018
59	--	--	--	0.006	0.006	0.058	0.064
63	--	--	0.244	0.056	0.300	0.820	1.120
64	--	0.054	--	0.004	0.058	0.476	0.534
67	--	0.102	-	0.015	0.117	0.532	0.649
72	--	--	0.056	--	0.056	0.124	0.180
79	--	0.035	--	0.002	0.037	0.284	0.321
90	--	0.240	--	0.750	0.990	0.535	1.525
91	--	--	0.020	0.473	0.493	0.211	0.704
93	--	0.126	--	0.224	0.350	0.340	0.690
94	--	--	--	0.004	0.004	0.058	0.062
102	--	--	--	0.003	0.003	0.031	0.034
103	--	0.016	--	--	0.016	0.244	0.260
105	--	0.042	--	0.014	0.056	1.455	1.511
106	--	0.062	--	--	0.062	0.167	0.229

Feature	*Juglans cinerea*	*Juglans nigra*	*Juglans Sp.*	*Quercus Sp.*	MESIC UPLAND SUBTOTAL	*Carya Sp.*	TOTAL GRAM WEIGHT
108	--	0.028	--	0.002	0.030	0.562	0.592
111	--	0.026	0.014	0.051	0.091	2.064	2.155
113	--	0.013	0.247	--	0.260	0.687	0.947
116	--	0.116	0.051	0.003	0.170	0.666	0.836
117	0.035	0.031	--	0.036	0.102	0.576	0.678
118	--	0.035	--	0.004	0.039	0.079	0.118
120	--	--	--	0.003	0.003	0.738	0.741
122	--	--	--	--	--	0.055	0.055
124	--	0.067	--	0.022	0.089	0.329	0.418
127	--	0.091	--	--	0.091	0.529	0.620
127R127 L-3	0.045	0.174	--	--	0.219	0.540	0.759
130R203 L-3	--	--	0.007	0.013	0.020	0.066	0.086
136R230 L-3	--	0.102	0.103	0.337	0.542	1.770	2.312
133R230 L-2	--	0.190	0.051	0.126	0.367	2.300	2.667
136R230 L-2	--	0.070	--	0.002	0.072	0.089	0.161
136R231 L-2	--	--	0.049	--	0.049	0.207	0.256
136R231 L-5	--	0.060	--	0.063	0.123	0.674	0.797
136R231 L-7	--	--	--	--	--	0.125	0.125
136R231 L-8	0.034	0.078	--	0.078	0.190	0.473	0.663
136R231 L-10	--	--	--	0.012	0.012	0.006	0.018
TOTAL	0.743	5.841	2.682	3.341	12.607	40.091	52.698

= value corrected from original report edition

APPENDIX F:
CARBONIZED SEEDS AND FRUITS BY WHOLE AND FRAGMENTARY SPECIMENS, CATEGORIZED BY HABITAT

Feature Number

	1		4		6		7		8		9		14		16		19		21		23	
	W*	F*	W	F	W	F	W	F	W	F	W	F	W	F	W	F	W	F	W	F	W	F
Gleditsia Triacanthos																						
Prunus spp.																		3		1		
Tuber (fleshy)																						
BOTTOMLAND SUBTOTAL																	3		1			
Cyperus sp.																						
Galium sp.																						
Graminacae																						
Phytolacca americana				2										6								
Rhus sp					1																	
Rubus sp.																						
Xanthium																						
DISTURBED LAND SUBTOTAL			2		1								6									
Amaranthus sp.																						
Asteracease seedhead																2	3	1				
Chenopodium sp.	2				1	1	1						6	19				2				2
Leguminosae																						
Phalaris Carolina													1				1					
Polygonum sp.																				3		
POTENTIAL CULTIGEN SUBTOTAL	2				2		1						26		2		7		3		2	
Cucurbitacease		3																				
Cucurbita sp.																						
Cucurbita pepo																						2
Cucurbita pepo peduncle																						
CULTIGEN SUBTOTAL	3																					
Flower bud/stem																						2
Unknown seed	3								1				1									
Unidentifiable seed/fruit												1					2					
TOTAL	8		2		3		1		1		1		33		2		12		4		6	

	Feature Number																					
	26		29		32		33		34		37		39		40		45		46		47	
	W	F	W	F	W	F	W	F	W	F	W	F	W	F	W	F	W	F	W	F	W	F
Gleditsia Triacanthos																						
Prunus spp.																						
Tuber (fleshy)										1												
BOTTOMLAND SUBTOTAL									1													
Cyperus sp.																						
Galium sp.																						
Graminacae																					1	
Phytolacca americana					1																	
Rhus sp																						
Rubus sp.																						
Xanthium																						
DISTURBED LAND SUBTOTAL					1																1	
Amaranthus sp.																						
Asteracease seedhead		1		2														4				
Chenopodium sp.		2		3				1							3	6			1	2	2	4
Leguminosae																						
Phalaris Carolina			1																			1
Polygonum sp.																						
POTENTIAL CULTIGEN SUBTOTAL	3		6				1								9		4		3		9	
Cucurbitacease																						
Cucurbita sp.												4				3						
Cucurbita pepo																						
Cucurbita pepo peduncle																						
CULTIGEN SUBTOTAL			2								4				3							
Flower bud/stem															1							
Unknown seed														1		1						
Unidentifiable seed/fruit												1										
TOTAL	3		8		1		1		1		5		1		14		4		3		9	

	Feature Number																					
	49		51		58		59		63		64		67		72		88		90		91	
	W	F	W	F	W	F	W	F	W	F	W	F	W	F	W	F	W	F	W	F	W	F
Gleditsia Triacanthos																						
Prunus spp.																						
Tuber (fleshy)																						2
BOTTOMLAND SUBTOTAL																			3		2	
Cyperus sp.																						
Galium sp.																						
Graminacae																						
Phytolacca americana																						
Rhus sp																						
Rubus sp.																						
Xanthium																						
DISTURBED LAND SUBTOTAL																						
Amaranthus sp.															1						1	
Asteracease seedhead								1		1		1										
Chenopodium sp.						1	1		3	1			1		5	2	2				3	72
Leguminosae						1																2
Phalaris Carolina																					1	
Polygonum sp.	1	5							1	1												3
POTENTIAL CULTIGEN SUBTOTAL	6				2		2		7		1		1		8		2				82	
Cucurbitacease					1									3		4						1
Cucurbita sp.		1		3						8				3		3						1
Cucurbita pepo								6														
Cucurbita pepo peduncle																						
CULTIGEN SUBTOTAL			3		1		6		8				6		7						2	
Flower bud/stem														1		2						1
Unknown seed								3	1	1												
Unidentifiable seed/fruit		1								4												8
TOTAL	8		3		3		11		21		1		8		17		2		3		95	

*W=whole F=Fragmentary

= value corrected from original report edition

APPENDIX G:
PROVENIENCE OF SELECTED CHIPPED AND GROUND STONE IMPLEMENTS AND FAUNAL ELEMENTS

The following Appendix was prepared by Cridlebaugh for publication with the original Penitentiary Branch report, but not subsequently included in that publication. It is presented here as a scan of the original printed file. Several artifact categories included in this Appendix do not appear elsewhere in the report (e.g., Spalls, Projectile Point Category 0, and Crinoid Stems), and Biological Species names have not been updated from the original document.

Blanks
    1 Stage 2
        1111- 0,
    1 Stage 4
        1111- 0,

Spalls
    2
        1111- 0,1111- 0,

Preforms
    1 Stage 1
        1111- 0,
    3 Stage 2
        1111- 0,1111- 0,1111- 0,
    1 Stage 3
        1111- 0,

Projectile points
    1 Category 2
        1111- 2,
    1 Category 5
        1111-21,
    1 Category 6
        1111- 7,
    1 Category 7
        1111- 8,
    1 Category 8
        1111- 1,
    3 Category 14
        1111- 3,1111- 5,1111- 6,
    1 Category 16
        1111-20,
    1 Category 17
        1111- 9,
    1 Category 22
        1111- 4,

Preform/blank/bifacial fragments
    2 Indeterminate biface fragment
        1111- 0,1111- 0,
    1 Blank fragment
        1111- 0,

Projectile point fragments
    2 Distal
        1111- 0,1111- 0,

Blanks
5 Stage 1
1008- 1,1008- 4,1012- 8,1084- 2,1105- 0,
6 Stage 2
1008- 2,1012- 3,1012- 9,1079- 2,1092- 4,1095- 1
1 Stage 3
1079- 1,

Knives
1 Stemmed
1038- 4,

Scrapers
1 Core scraper
1042-13,

Preforms
4 Stage 1
1085- 1,1085-11,1092- 1,1092- 5,
8 Stage 2
1008-35,1038- 4,1072- 2,1072- 3,1079- 3,1085- 2
1085- 3,1085- 5,
9 Stage 3
1000- 3,1008- 8,1056- 3,1058- 1,1071- 5,1072- 4
1074- 3,1080- 4,1097- 6,

Drills
1 Indeterminate
1105- 0,
2 On a finished biface
1087- 5,1091- 3,
1 On a nodular flake
1092-16,

Projectile points
2 Category 0
1005- 7,1072- 6,
2 Category 3
1072-12,1082- 6,
5 Category 4
1000- 2,1005- 2,1038- 7,1091- 4,1097- 2,
3 Category 5
1083-11,1085- 6,1092-10,
1 Category 6
1071- 2,
5 Category 8
1012- 4,1038- 2,1080- 3,1091- 1,1092- 6,

1 Category 9
1080- 5,
2 Category 11
1082- 2,1084- 5,
3 Category 13
1000- 1,1071- 7,1082- 7,
1 Category 14
1087- 2,
2 Category 16
1038- 8,1092- 7,
10 Category 17
1071- 3,1071- 4,1072- 5,1072-77,1080- 1,1083- 8
1083-10,1085- 4,1087- 4,1092- 2,
1 Category 18
1008- 3,
1 Category 19
1072-79,
1 Category 21
1085-10,
3 Category 23
1008- 7,1012- 2,1092- 8,
1 Category 25
1071- 6,
2 Category 26
1072-11,1080- 7,
1 Category 27
1097- 1,
1 Category 28
1087- 1,

Cores
4 Subconical
1084- 1,1084- 6,1092- 3,1094- 1,
3 Amorphous
1008- 9,1084- 3,1087- 3,
1 Discoidal
1078- 3,

Hammerstones
1
1083- 3,

Miscellaneous
1 Ground stone pipe blank
1080- 0,
1 Drill preform
1078- 2,
1 Crinoid stem
1091- 5,
1 Cobble chopper
1083- 1,

Utilized flakes
7 Bifacial thinning flake
1072- 1,1072-10,1074- 5,1082- 4,1083- 4,1083-12
1092- 9,
1 Shatter fragment
1097-11,

Preform/blank/bifacial fragments
5 Indeterminate biface fragment
1005- 4,1005- 4,1005-36,1008- 6,1095- 6,
6 Proximal portion
1000- 4,1008- 6,1012-26,1072- 7,1084- 4,1097- 9
3 Medial portion
1012- 1,1012- 5,1038- 1,
13 Distal portion
1000- 2,1008- 2,1012- 6,1038- 3,1056- 2,1058- 5
1071- 8,1085- 8,1085-12,1095- 3,1097- 4,1097- 7
1097- 8,
8 Blank fragment
1000- 1,1038- 6,1074- 1,1080- 8,1083- 6,1083- 7
1083- 9,1085- 9,

Projectile point fragments
24 Distal
1005- 5,1008-34,1012- 7,1038- 9,1056- 1,1058- 2
1058- 5,1058- 6,1074- 3,1074- 4,1075- 2,1078- 1
1080- 1,1080- 6,1081- 1,1082- 1,1082- 3,1082- 5
1083-18,1085-13,1087- 6,1095- 2,1095- 4,1095- 5
2 Medial
1075- 1,1084- 7,

Indeterminate

Elements	Fragments	
	1	Other

Indeterminate mammal

Elements	Fragments	
	3	Other

Indeterminate large mammal

Elements	Fragments	
	76	Other

Homo sapiens

Elements	Fragments	
	1	Other

Odocileus virginianus

Elements	Fragments	
1		Antler
3		Dental

22 5 Other

Cervus canadensis

Elements	Fragments	
2		Other

Procyon lotor

Elements	Fragments	
1		Other

Ursus americanus

Elements	Fragments	
1		Dental

Marmota monax

Elements	Fragments	
1		Dental

Indeterminate bird

Elements	Fragments	
	1	Other

Indeterminate large bird

Elements	Fragments	
	1	Other

Meleagris gallopavo

Elements	Fragments	
1		Other

Buteo jamaicensis

Elements	Fragments	
1		Other

Ana sp.

Elements	Fragments	
1		Other

Indeterminate turtle

Elements	Fragments	
2		Other

Trionyx spiniferus

Elements	Fragments	
1		Other

Indeterminate fish

Elements	Fragments	
	1	Other

Blanks
- 6 Stage 1
  1001- 0,1001- 8,1006- 1,1006- 2,1066- 1,1077- 3
- 5 Stage 2
  1009-30,1033- 2,1033- 3,1059- 4,1059- 7,
- 6 Stage 3
  1009-13,1019- 9,1023- 7,1033- 5,1059- 2,1089- 1
- 3 Stage 4
  1006- 3,1006- 9,1009-23,

Knives
- 1 Triangular/rounded base
  1023- 6,

Chisels
- 2 Chipped stone
  1006- 9,1062- 1,

Scrapers
- 2 Unifacial end and side scraper
  1006-23,1099- 1,
- 1 Unifacial side scraper
  1006-24,

Axes
- 2
  1033-49,1110-18,

Spalls
- 1
  1059- 7,

Preforms
- 4 Stage 1
  1009- 5,1023- 1,1029- 2,1059- 1,
- 6 Stage 2
  1001- 0,1006- 7,1023- 2,1059- 3,1089- 2,1096- 0
- 5 Stage 3
  1006-11,1009- 2,1029- 1,1059-13,1109- 0,

Drills
- 3 Indeterminate
  1006-32,1009-38,1109- 0,
- 2 On a finished biface
  1009-10,1013- 2,

Projectile points
1 Category 0
1013- 4,
3 Category 3
1013- 3,1013- 6,1062-22,
1 Category 5
1062- 2,
3 Category 6
1009- 7,1066- 0,1089- 3,
3 Category 8
1009- 5,1062- 1,1103- 4,
2 Category 9
1033- 4,1059-10,
1 Category 10
1033- 1,
1 Category 11
1023- 0,
1 Category 12
1108- 0,
3 Category 13
1001- 0,1009- 4,1019- 3,
4 Category 14
1019- 2,1019- 6,1033- 2,1103- 5,
1 Category 15
1019-10,
1 Category 16
1009-17,
3 Category 17
1009- 3,1098-50,1098-51,
3 Category 18
1019- 1,1019- 8,1098-65,
1 Category 20
1077- 2,
1 Category 22
1023- 5,
2 Category 25
1013- 1,1053- 1,
2 Category 29
1013- 5,1077- 1,
2 Category 32
1006- 5,1029- 4,

Cores
4 Subconical
1009-16,1009-42,1019-11,1023-21,
6 Amorphous
1001- 1,1001- 9,1006-28,1009- 1,1009-41,1062- 3
1 Discoidal
1006-25,

Notched flakes
    1 On a flake
         1006-17,

Miscellaneous
    1 Drill/graver
         1009-10,
    2 Drill preform
         1001- 5,1059- 5,
    4 Crinoid stem
         1006- 1,1006- 2,1006- 3,1062- 4,
    1 Pitted cobble
         1099-46,
    1 Limestone temp. sherd
         1009-19,
    1 Daub fragment
         1009-18,

Utilized flakes
    4 Decortication flake
         1006-18,1006-20,1009-12,1009-13,
    5 Bifacial thinning flake
         1001- 2,1006-16,1009-21,1013- 7,1059-14,

Preform/blank/bifacial fragments
   12 Indeterminate biface fragment
         1006- 4,1006- 4,1006- 5,1006- 5,1006-30,1006-30
         1006-34,1009-22,1009-22,1009-29,1009-35,1066- 4
    4 Proximal portion
         1009-14,1009-15,1059-12,1099-45,
    2 Medial portion
         1001- 3,1033- 5,
    8 Distal portion
         1006- 6,1009-40,1019- 4,1023- 3,1023- 4,1033- 2
         1033- 3,1059- 8,
    7 Blank fragment
         1006-27,1009-27,1009-29,1009-32,1009-33,1013- 1
         1103- 3,

Projectile point fragments
   22 Distal
         1001-10,1006- 1,1006-10,1006-31,1006-33,1006-35
         1009- 6,1009- 8,1009-19,1009-31,1009-36,1009-37
         1019- 5,1019- 7,1033- 4,1033- 6,1053- 2,1059- 9
         1059-16,1066- 2,1089- 4,1103- 2,
    6 Medial
         1006- 8,1006-12,1006-28,1009- 9,1009-24,1059- 6
    4 Proximal
         1006- 2,1006- 3,1009-15,1062- 1,

Indeterminate mammal

Elements	Fragments	
1	90	Other

Indeterminate large mammal

Elements	Fragments	
4	139	Other

Homo sapiens

Elements	Fragments	
4		Other

Odocoileus virginianus

Elements	Fragments	
2	3	Dental
134	17	Other

Cervus canadensis

Elements	Fragments	
3		Other

Procyon lotor

Elements	Fragments	
2		Other

Ursus americanus

Elements	Fragments	
2		Other

Marmota monax

Elements	Fragments	
1		Dental

Indeterminate bird

Elements	Fragments	
	10	Other

Meleagris gallopavo

Elements	Fragments	
8		Other

Indeterminate turtle

Elements	Fragments	
2	1	Other

Terrapene carolina

Elements	Fragments	
42		Other

Indeterminate fish
Elements Fragments
1 Other

Aplodinctus grunniens
Elements Fragments
1 Other

Level 3 LEVEL 3

Blanks
1 Stage 1
1010-22,
9 Stage 2
1002- 5,1007- 0,1024- 2,1030- 4,1030- 5,1030- 7
1052- 9,1076- 1,1088-22,
5 Stage 3
1002-16,1021- 3,1030- 8,1052-14,1052-15,
4 Stage 4
1030- 2,1088- 4,1088- 5,1088- 7,
1 Stage 5
1088-30,

Knives
1 Stemmed
1088- 6,
1 Triangular/rounded base
1088- 3,
1 Backed
1021- 4,

Chisels
1 Chipped stone
1021- 5,

Adzes
1 Chipped stone
1007- 6,

Scrapers
2 Unifacial side scraper
1002- 9,1002-19,
1 Bifacial end scraper
1088-17,

Axes
1
1021-44,

Spalls
1
1021- 1,

Preforms
8 Stage 1
1010- 4,1021- 2,1022- 7,1024- 7,1076- 2,1088- 9
1088-19,1088-27,
7 Stage 2
1007- 3,1010-45,1022- 3,1030- 4,1076- 1,1088- 8
1088-36,
19 Stage 3
1002- 0,1007- 0,1007- 4,1010-11,1010-13,1010-35
1010-48,1014-37,1022- 9,1030- 1,1047- 3,1052- 1
1052- 3,1088-13,1088-14,1088-20,1088-24,1088-41
1093- 1,

Drills
1 On a projectile point
1088-29,
2 On a finished biface
1002-18,1007- 7,

Projectile points
2 Category 0
1002- 4,1002-29,
4 Category 3
1052- 4,1052- 7,1076- 3,1088-31,
1 Category 4
1088-38,
1 Category 5
1010-12,
2 Category 6
1088- 4,1088-21,
3 Category 8
1015- 1,1022- 8,1052- 2,
1 Category 9
1010- 8,
1 Category 11
1002-25,
5 Category 13
1010- 7,1022- 4,1030- 6,1088-10,1088-15,
5 Category 14
1010-29,1021- 9,1030-10,1047- 5,1088-37,
1 Category 16
1010-10,
3 Category 17
1007-10,1010- 2,1088-26,
1 Category 18
1014- 0,

2 Category 19
1002- 1,1088- 1,
2 Category 21
1030- 2,1088-12,
1 Category 22
1010- 9,
2 Category 23
1010-26,1021- 6,
1 Category 24
1088-32,
2 Category 25
1007- 8,1088-25,
1 Category 26
1002- 2,
1 Category 31
1022- 2,
1 Category 32
1007- 9,
1 Category 33
1007- 0,

Cores
2 Subconical
1030- 3,1052-13,
5 Amorphous
1002- 6,1007-12,1010-37,1024- 1,1076- 7,

Hammerstones
2
1007-13,1021- 1,

Notched flakes
1 On a biface
1010-33,

Miscellaneous
1 Proj. pt./notched biface
1010-33,
1 Limestone temp. sherd
1010-19,

Utilized flakes
2 Decortication flake
1007-15,1052-11,
5 Bifacial thinning flake
1010-30,1010-31,1024- 6,1030-11,1076- 4,

Preform/blank/bifacial fragments
5 Indeterminate biface fragment
1002- 8,1002- 8,1002-20,1007-18,1010-44,

7 Proximal portion
1007- 1,1030- 1,1030- 9,1047- 4,1052- 8,1088-18
1088-33,

4 Medial portion
1022- 5,1030-12,1088-28,1093- 2,

10 Distal portion
1010-15,1010-17,1010-38,1021- 7,1021- 8,1030- 5
1030- 6,1052- 5,1052- 6,1088- 6,

11 Blank fragment
1002- 7,1007- 5,1007-20,1010-14,1010-35,1010-41
1015- 1,1030- 7,1030- 8,1030- 9,1052-10,

Projectile point fragments

24 Distal
1002- 3,1002-21,1002-23,1007- 2,1007-16,1007-17
1010- 3,1010-16,1010-24,1010-25,1010-37,1010-42
1010-46,1014- 0,1022- 1,1030- 3,1047- 1,1047- 2
1088- 1,1088-11,1088-16,1088-23,1088-31,1088-40

12 Medial
1002-17,1002-22,1002-26,1002-27,1007- 0,1010- 7
1010- 8,1010-20,1010-23,1010-40,1022- 6,1047- 3

2 Proximal
1002-24,1010-34,

Indeterminate mammal

Elements	Fragments	
2	70	Other

Indeterminate large mammal

Elements	Fragments	
	1332	Other

Indeterminate small mammal

Elements	Fragments	
7	1	Other

Homo sapiens

Elements	Fragments	
1		Dental
1		Other

Odocileus virginianus

Elements	Fragments	
31		Antler
35	16	Dental
432	54	Other

Cervus canadensis

Elements	Fragments	
3	1	Dental
8		Other

Mephitis mephitis

Elements	Fragments	
1		Dental

Procyon lotor

Elements	Fragments	
1		Dental
13		Other

Ursus americanus

Elements	Fragments	
1		Dental

Urocyon cinereoargenteus

Elements	Fragments	
2		Other

Canis familiaris

Elements	Fragments	
1		Dental
2		Other

Canis sp.

Elements	Fragments	
2		Other

Erethizon dorsatum

Elements	Fragments	
1		Dental

Castor canadensis

Elements	Fragments	
2		Other

Sciurus carolinensis

Elements	Fragments	
2		Other

Marmota monax

Elements	Fragments	
1		Dental
2		Other

Tamias struatus

Elements	Fragments	
1		Other

Sylvilagus floridanus

Elements	Fragments	
1		Other

Sus scrofa

Elements	Fragments	
	1	Dental

Indeterminate bird

Elements	Fragments	
24	21	Other

Indeterminate large bird

Elements	Fragments	
	9	Other

Meleagris gallopavo

Elements	Fragments	
24	2	Other

Indeterminate turtle

Elements	Fragments	
4	15	Other

Crotalidae

Elements	Fragments	
1		Other

Colubridae

Elements	Fragments	
4		Other

Chrysemys/Grapetmys sp.

Elements	Fragments	
3		Other

Terrapene carolina

Elements	Fragments	
50	1	Other

Trionyx spiniferus

Elements	Fragments	
12	4	Other

Rana catesbeiana

Elements	Fragments	
1		Other

Indeterminate fish

Elements	Fragments	
	16	Other

Ictalurus punctatus

Elements	Fragments	
1		Dental

4 Other

Aplodinctus grunniens
Elements Fragments
5 Other

Indeterminate mussel
Elements Fragments
10 Other

Anculosa sp.
Elements Fragments
2 Other

Level 4 LEVEL 4

Blanks
1 Stage 3
1026- 2,

Preforms
1 Stage 1
1026- 1,
1 Stage 2
1003- 1,
1 Stage 3
1011-13,

Drills
1 On a finished biface
1026- 0,

Projectile points
1 Category 4
1049- 0,
2 Category 8
1026- 0, 1069- 0,
1 Category 13
1003- 5,
1 Category 17
1106- 0,

Hammerstones
1
1104- 1,

Miscellaneous
1 Crinoid stem
1049- 5,

Preform/blank/bifacial fragments

- 3 Indeterminate biface fragment
  - 1003- 6, 1003-36, 1037- 1,
- 2 Proximal portion
  - 1003- 4, 1049-81,
- 1 Medial portion
  - 1003- 3,
- 3 Distal portion
  - 1011- 1, 1049- 1, 1049- 4,
- 1 Blank fragment
  - 1003- 1,

Projectile point fragments

- 3 Distal
  - 1003- 2, 1003- 7, 1011- 2,

Indeterminate mammal

Elements	Fragments	
	52	Other

Indeterminate large mammal

Elements	Fragments	
	154	Other

Indeterminate medium mammal

Elements	Fragments	
1		Other

Indeterminate small mammal

Elements	Fragments	
1		Dental

Odocileus virginianus

Elements	Fragments	
2		Antler
8	3	Dental
49	17	Other

Procyon lotor

Elements	Fragments	
3		Other

Ursus americanus

Elements	Fragments	
1		Other

Erethizon dorsatum

Elements	Fragments	
1		Other

Sciurus carolinensis
Elements Fragments
2 Other

Marmota monax
Elements Fragments
1 Dental

Indeterminate bird
Elements Fragments
11 Other

Indeterminate turtle
Elements Fragments
16 Other

Colubridae
Elements Fragments
1 Other

Terrapene carolina
Elements Fragments
17 1 Other

Trionyx spiniferus
Elements Fragments
3 Other

Indeterminate fish
Elements Fragments
3 Other

Level 5 LEVEL 5

Blanks
3 Stage 1
1004- 5,1045- 4,1045- 5,
1 Stage 2
1046- 1,
1 Stage 3
1045- 1,
2 Stage 4
1045- 2,1045- 3,

Scrapers
1 Unifacial end and side scraper
1020- 2,

Spalls
    1
        1004-14,

Preforms
    2 Stage 1
        1046- 2,1046- 5,
    4 Stage 3
        1004- 2,1046- 6,1046- 8,1102- 0,

Projectile points
    1 Category 0
        1107- 0,
    1 Category 22
        1004- 4,
    1 Category 26
        1020- 1,

Cores
    1 Amorphous
        1046- 3,

Hammerstones
    1
        1046- 9,

Preform/blank/bifacial fragments
    2 Indeterminate biface fragment
        1004- 3,1004- 3,
    1 Proximal portion
        1045- 2,
    1 Medial portion
        1046- 4,
    1 Blank fragment
        1045- 3,

Indeterminate mammal

Elements	Fragments	
1	96	Other

Indeterminate large mammal

Elements	Fragments	
	104	Other

Indeterminate small mammal

Elements	Fragments	
1		Other

Homo sapiens

Elements	Fragments	
1		Other

Odocileus virginianus

Elements	Fragments	
6	1	Antler
7	1	Dental
77	17	Other

Cervus canadensis

Elements	Fragments	
3		Other

Procyon lotor

Elements	Fragments	
3		Dental

Urocyon cinereoargenteus

Elements	Fragments	
1		Other

Castor canadensis

Elements	Fragments	
1		Dental
1		Other

Indeterminate bird

Elements	Fragments	
	6	Other

Meleagris gallopavo

Elements	Fragments	
1		Other

Indeterminate turtle

Elements	Fragments	
	2	Other

Crotalidae

Elements	Fragments	
2		Other

Terrapene carolina

Elements	Fragments	
6		Other

Trionyx spiniferus

Elements	Fragments	
2		Other

Indeterminate fish

Elements	Fragments	
	4	Other

Moxostoma sp.

Elements	Fragments	
1		Dental

Level 6   LEVEL 6

Blanks
- 1 Stage 2
  - 1065- 1,

Preforms
- 1 Stage 2
  - 1065- 3,

Drills
- 1 On a projectile point
  - 1060- 4,

Projectile points
- 1 Category 4
  - 1065- 6,
- 1 Category 6
  - 1065- 2,
- 1 Category 17
  - 1032- 9,
- 1 Category 21
  - 1060- 1,
- 1 Category 26
  - 1060- 3,

Utilized flakes
- 1 Bifacial thinning flake
  - 1032-67,

Preform/blank/bifacial fragments
- 2 Indeterminate biface fragment
  - 1032- 1,1032- 1,
- 1 Distal portion
  - 1060- 2,

Projectile point fragments
- 3 Distal
  - 1065- 0,1065- 4,1065- 5,

Indeterminate

Elements	Fragments	
1		Other

Indeterminate mammal

Elements	Fragments	
	34	Other

Indeterminate large mammal

Elements	Fragments	
	110	Other

Indeterminate small mammal

Elements	Fragments	
2	3	Other

Homo sapiens

Elements	Fragments	
1		Other

Odocileus virginianus

Elements	Fragments	
1	10	Antler
12	6	Dental
52	8	Other

Procyon lotor

Elements	Fragments	
2		Other

Castor canadensis

Elements	Fragments	
1		Other

Indeterminate bird

Elements	Fragments	
	4	Other

Meleagris gallopavo

Elements	Fragments	
4		Other

Indeterminate turtle

Elements	Fragments	
	2	Other

Terrapene carolina

Elements	Fragments	
7		Other

Trionyx spiniferus

Elements	Fragments	
1		Other

Rana/Bufo sp.

Elements	Fragments	
1		Other

Indeterminate fish
Elements Fragments
9 Cther

Moxostoma sp.
Elements Fragments
1 Other

Level 7 LEVEL 7

Blanks
1 Stage 4
1048- 1,

Spalls
1
1061-93,

Preforms
1 Stage 1
1061- 1,
2 Stage 3
1040- 0,1061- 0,

Drills
1 Indeterminate
1048- 3,
1 On a bifacila thinning flake
1025- 2,

Projectile points
2 Category 13
1025- 0,1061-92,
1 Category 20
1061-94,

Cores
2 Amorphous
1025- 1,1061- 3,

Preform/blank/bifacial fragments
3 Indeterminate biface fragment
1040-25,1048- 2,1048- 2,
1 Proximal portion
1048- 7,

Indeterminate
Elements Fragments
1 Cther

Indeterminate mammal

Elements	Fragments	
1	41	Other

Indeterminate large mammal

Elements	Fragments	
	145	Other

Odocoileus virginianus

Elements	Fragments	
7	13	Antler
5	6	Dental
68	9	Other

Cervus canadensis

Elements	Fragments	
3		Other

Urocyon cinereoargenteus

Elements	Fragments	
1	1	Dental

Marmota monax

Elements	Fragments	
1		Other

Indeterminate bird

Elements	Fragments	
	11	Other

Meleagris gallopavo

Elements	Fragments	
2		Other

Terrapene carolina

Elements	Fragments	
15		Other

Indeterminate fish

Elements	Fragments	
2	2	Other

Moxostoma sp.

Elements	Fragments	
1		Dental
2		Other

Ictalurus punctatus

Elements	Fragments	
1		Other

Aplodinotus grunniens

Elements	Fragments	
2		Other

Anculosa sp.

Elements	Fragments	
1		Other

Level 8

LEVEL 8

Blanks
- 1 Stage 2
  - 1036- 1,
- 1 Stage 3
  - 1050- 1,
- 1 Stage 5
  - 1035- 1,

Knives
- 1 Triangular/rounded base
  - 1057- 2,

Spalls
- 3
  - 1050- 2,1057- 1,1057-97,

Preforms
- 1 Stage 2
  - 1057- 2,
- 1 Stage 3
  - 1057- 1,

Hammerstones
- 1
  - 1035- 2,

Miscellaneous
- 1 Abraded cobble
  - 1057- 3,

Projectile point fragments
- 1 Distal
  - 1057- 1,
- 1 Medial
  - 1035- 0,

Indeterminate mammal

Elements	Fragments	
1		Dental
	13	Other

Indeterminate large mammal

Elements	Fragments	
	190	Other

Indeterminate small mammal

Elements	Fragments	
1		Other

Odocileus virginianus

Elements	Fragments	
17		Antler
7	2	Dental
56	17	Other

Cervus canadensis

Elements	Fragments	
3		Other

Procyon lotor

Elements	Fragments	
4		Other

Ursus americanus

Elements	Fragments	
1		Other

Urocyon cinereoargenteus

Elements	Fragments	
1		Other

Marmota monax

Elements	Fragments	
1		Dental

Indeterminate bird

Elements	Fragments	
	3	Other

Meleagris gallopavo

Elements	Fragments	
2	9	Other

Indeterminate turtle

Elements	Fragments	
	20	Other

Terrapene carolina

Elements	Fragments	
15		Other

Trionyx spiniferus
Elements Fragments
3 Other

Indeterminate fish
Elements Fragments
1 2 Other

Ictalurus sp.
Elements Fragments
2 Other

Indeterminate mussel
Elements Fragments
1 Other

Level 9 LEVEL 9

Blanks
1 Stage 3
1055- 0,

Spalls
1
1055- 4,

Preforms
2 Stage 3
1034- 1, 1034-10,

Projectile points
1 Category 9
1055- 1,
1 Category 14
1034- 2,
1 Category 18
1034-44,

Preform/blank/bifacial fragments
1 Distal portion
1034- 3,

Indeterminate mammal
Elements Fragments
1 9 Other

Indeterminate large mammal
Elements Fragments
266 Other

Odocileus virginianus

Elements	Fragments	
3	1	Antler
10		Dental
51	20	Other

Indeterminate bird

Elements	Fragments	
	6	Other

Meleagris gallopavo

Elements	Fragments	
4		Other

Colubridae

Elements	Fragments	
1		Other

Terrapene carolina

Elements	Fragments	
14		Other

Trionyx spiniferus

Elements	Fragments	
1		Other

Indeterminate fish

Elements	Fragments	
	1	Other

Indeterminate mussel

Elements	Fragments	
	1	Other

Pleurocera sp.

Elements	Fragments	
1		Other

Level 10

LEVEL 10

Blanks
  1 Stage 2
    1041- 0,

Scrapers
  1 Unifacial side scraper
    1063- 1,

Axes
1
1063-85,

Preform/blank/bifacial fragments
1 Distal portion
1063- 2,

Indeterminate mammal

Elements	Fragments	
2	11	Other

Indeterminate large mammal

Elements	Fragments	
	146	Other

Odocoileus virginianus

Elements	Fragments	
5		Dental
41	3	Other

Procyon lotor

Elements	Fragments	
4		Other

Indeterminate bird

Elements	Fragments	
	6	Other

Meleagris gallopavo

Elements	Fragments	
2		Other

Indeterminate turtle

Elements	Fragments	
	1	Other

Terrapene carolina

Elements	Fragments	
11		Other

Trionyx spiniferus

Elements	Fragments	
2		Other

Level 11 LEVEL 11

Blanks
2 Stage 2
1051- 4,1051- 6,

2 Stage 3
1051- 1, 1051- 5,

Preforms
1 Stage 3
1051- 3,

Preform/blank/bifacial fragments
1 Distal porticn
1051- 2,

Projectile point fragments
1 Distal
1051- 7,

Indeterminate large mammal

Elements	Fragments	
	111	Cther

Odocileus virginianus

Elements	Fragments	
	1	Antler
3	1	Dental
18	8	Cther

Cervus canadensis

Elements	Fragments	
4		Dental
8		Other

Indeterminate bird

Elements	Fragments	
	2	Cther

Meleagris gallopavc

Elements	Fragments	
1		Other

Terrapene carclina

Elements	Fragments	
2	3	Cther

Level 20 _LEVEL 20_

Blanks
4 Stage 1
1039- 3, 1090- 1, 1100- 4, 1101- 5,
5 Stage 2
1017-11, 1017-12, 1039- 3, 1090-17, 1090-20,
5 Stage 3
1016- 5, 1017- 1, 1017- 1, 1039- 6, 1070-11,

2 Stage 4
1070- 1,1090-16,
1 Stage 5
1090-11,

Knives
1 Triangular/rounded base
1070- 6,

Adzes
1 Chipped stone
1101- 0,

Spalls
3
1017-16,1031- 3,1090-89,

Preforms
5 Stage 1
1016- 8,1017- 4,1039- 2,1039- 8,1070- 2,
9 Stage 2
1016- 4,1017- 0,1017- 3,1028- 6,1039- 7,1039-14
1090- 7,1101-14,1101-15,
14 Stage 3
1016- 6,1017- 0,1017- 0,1017- 0,1017- 1,1017- 6
1028- 2,1028- 7,1039-17,1070- 3,1090- 2,1090- 6
1090-15,1101-11,

Drills
2 Indeterminate
1016- 7,1101- 7,
1 On a finished biface
1039-18,
1 On a rough biface
1101- 6,
1 On a bifacila thinning flake
1039- 9,

Projectile points
3 Category 0
1017- 7,1017- 9,1090-13,
1 Category 3
1039- 4,
2 Category 4
1017-25,1101-16,
1 Category 5
1101-17,
1 Category 6
1018- 0,
3 Category 8
1068- 1,1070- 9,1101- 0,

1 Category 9
1070- 7,
2 Category 13
1039- 1, 1039-13,
2 Category 14
1039- 2, 1039-12,
1 Category 15
1016- 2,
4 Category 17
1017-17, 1070- 4, 1070- 5, 1101-19,
2 Category 18
1090-18, 1100- 0,
1 Category 22
1028-13,
1 Category 26
1017-10,
1 Category 32
1039- 0,

Cores
2 Subconical
1017- 5, 1017- 9,
1 Amorphous
1100- 2,

Hammerstones
1
1016-12,

Notched flakes
2 On a biface
1017- 4, 1101-12,

Miscellaneous
1 Ground stone blank
1016- 1,

Utilized flakes
1 Decortication flake
1039-19,

Preform/blank/bifacial fragments
2 Indeterminate biface fragment
1016- 2, 1016- 7,
1 Proximal portion
1090-22,
3 Medial portion
1017- 8, 1017-11, 1090-21,
7 Distal portion
1016-11, 1031- 2, 1039- 4, 1039- 5, 1090- 4, 1090- 8
1100- 1,

15 Blank fragment
1016- 3,1017- 7,1017- 8,1017-10,1017-13,1028- 8
1028- 9,1028-10,1028-11,1070-10,1070-12,1090- 3
1090-23,1090-26,1101- 4,

Projectile point fragments
18 Distal
1017- 2,1017- 3,1017- 5,1028- 7,1028-12,1039- 1
1039-15,1039-16,1070- 8,1090- 5,1090- 9,1090-12
1090-14,1090-24,1101- 8,1101- 9,1101-10,1101-18
2 Medial
1017- 6,1100- 3,

Indeterminate mammal

Elements	Fragments	
2	23	Other

Indeterminate large mammal

Elements	Fragments	
	121	Other

Homo sapiens

Elements	Fragments	
1		Other

Odocoileus virginianus

Elements	Fragments	
1		Antler
2		Dental
57	8	Other

Cervus canadensis

Elements	Fragments	
1		Other

Ursus americanus

Elements	Fragments	
2		Other

Canis lupis

Elements	Fragments	
1		Other

Indeterminate bird

Elements	Fragments	
3	12	Other

Meleagris gallopavo

Elements	Fragments	
19	2	Other

Chrysemys sp.

Elements Fragments
1 Other

Terrapene carolina

Elements Fragments
3 1 Other

Trionyx spiniferus

Elements Fragments
2 1 Other

Feature 1

Feature 1

Perforators
1 Category 1
3001- 0,

Preforms
1 Stage 2
3001- 2,

Notched flakes
1 On a biface
3001- 1,

Utilized flakes
1 Bifacial thinning flake
3001- 3,

Preform/blank/bifacial fragments
1 Blank fragment
3001- 5,

Projectile point fragments
1 Medial
3001- 0,

Indeterminate mammal

Elements Fragments
58 Other

Indeterminate large mammal

Elements Fragments
4 Other

Indeterminate medium mammal

Elements Fragments
1 Other

Odocileus virginianus

Elements	Fragments	
2		Dental
4		Cther

Indeterminate turtle

Elements	Fragments	
	14	Cther

Colubridae

Elements	Fragments	
2	1	Other

Terrapene carclina

Elements	Fragments	
4		Cther

Indeterminate mussel

Elements	Fragments	
	4	Other

<u>Feature 2</u> <u>Feature 2</u>

Axes
    1
        3002- 1,

Projectile pcints
    1 Category 7
        3002- 3,

Utilized flakes
    1 Bifacial thinning flake
        3002- 8,

Preform/blank/bifacial fragments
    5 Indeterminate biface fragment
        3002- C,3002- C,3002- 0,3002- 5,3002- 5,
    1 Distal pcrticn
        3002- 2,

Indeterminate mammal

Elements	Fragments	
	16	Other

Odocileus virginianus

Elements	Fragments	
1		Cther

Indeterminate bird
Elements Fragments
1 Cther

Indeterminate turtle
Elements Fragments
2 Other

Terrapene carclina
Elements Fragments
1 Cther

Feature 3

Drills
1 Indeterminate
3003- 4,

Prcjectile pcints
1 Category 6
3003- 3,
1 Category 18
3003- 2,
1 Category 28
3003- 1,

Hammerstones
1
3003- 5,

Utilized flakes
1 Bifacial thinning flake
3003-13,

Preform/blank/bifacial fragments
1 Indeterminate biface fragment
3003- 0,

Indeterminate mammal
Elements Fragments
44 Other

Indeterminate medium mammal
Elements Fragments
3 Other

Odccileus virginianus
Elements Fragments
1 Dental
8 Other

Procyon lotor
Elements Fragments
1 Other

Canis familiaris
Elements Fragments
5 Other

Didelphus marsupialis
Elements Fragments
1 Dental

Indeterminate bird
Elements Fragments
3 Other

Terrapene carolina
Elements Fragments
9 Other

Trionyx spiniferus
Elements Fragments
1 Other

<u>Feature 4</u> <u>Feature 4</u>

Blanks
2 Stage 3
3004- 3,3004-13,

Perforators
1 Category 2
3004- 0,

Chisels
1 Chipped stone
3004-12,

Preforms
1 Stage 1
3004-11,
1 Stage 2
3004-19,
1 Stage 3
3004-12,

Drills
1 On a finished biface
3004-10,

```
Projectile points
    1  Categcry  3
         3004- 4,
    1  Categcry  5
         3004- 0,
    1  Categcry 21
         3004-16,
    1  Categcry 29
         3004-20,

Miscellanecus
    1  Crinoid stem
         3004-21,

Utilized flakes
    1  Bifacial thinning flake
         3004-26,

Preform/blank/bifacial fragments
    2  Indeterminate biface fragment
         3004- 8,3004- 8,
    1  Proximal pcrticn
         3004- 6,
    1  Medial pcrticn
         3004-22,
    4  Distal pcrticn
         3004- 5,3004-14,3004-15,3004-18,

Projectile point fragments
    2  Distal
         3004- 1,3004- 7,

Indeterminate mammal
  Elements  Fragments
                  1     Other

Indeterminate large mammal
  Elements  Fragments
                 65     Other

Cdocileus virgiriancs
  Elements  Fragments
       2                Dental
      15          1     Other

Indeterminate bird
  Elements  Fragments
                  4     Cther
```

Indeterminate turtle

Elements	Fragments	
7		Other

Terrapene carolina

Elements	Fragments	
3		Other

Indeterminate fish

Elements	Fragments	
	1	Other

Ictalurus sp.

Elements	Fragments	
1		Other

Feature 5 Feature 5

Preform/blank/bifacial fragments
- 2 Indeterminate biface fragment
  3005- 0,3005-11,
- 1 Medial portion
  3005- 5,
- 1 Blank fragment
  3005- 7,

Projectile point fragments
- 2 Distal
  3005- 4,3005- 6,

Indeterminate mammal

Elements	Fragments	
1		Other

Indeterminate large mammal

Elements	Fragments	
	72	Other

Indeterminate medium mammal

Elements	Fragments	
	1	Other

Odocoileus virginianus

Elements	Fragments	
1		Antler
16	5	Other

Indeterminate bird

Elements	Fragments	
	4	Other

Indeterminate turtle
Elements Fragments
5 Other

<u>Terrapene carolina</u>
Elements Fragments
1 3 Other

<u>Feature</u> <u>6</u> <u>Feature</u> <u>6</u>

Blanks
1 Stage 3
3006- 6,

Preforms
1 Stage 2
3006- 8,
1 Stage 3
3006- 7,

Projectile points
2 Category 17
3006- 2,3006- 5,
1 Category 18
3006- 1,

Notched flakes
1 On a flake
3006- 0,

Preform/blank/bifacial fragments
4 Indeterminate biface fragment
3006- 0,3006-12,3006-15,3006-15,
1 Distal portion
3006- 4,
2 Blank fragment
3006-10,3006-14,

Projectile point fragments
4 Distal
3006- 0,3006- 3,3006- 4,3006-13,
1 Proximal
3006- 0,

Indeterminate mammal
Elements Fragments
17 3 Other

<u>Odocileus virginianus</u>
Elements Fragments
5 1 Other

Indeterminate bird
Elements Fragments
1 Other

Meleagris gallopavo
Elements Fragments
1 Other

Feature 7

Feature 7

Projectile points
1 Category 5
3007- 1,

Cores
1 Subconical
3007-11,

Utilized flakes
1 Bifacial thinning flake
3007- 3,

Preform/blank/bifacial fragments
1 Blank fragment
3007- 2,

Indeterminate mammal
Elements Fragments
1 Other

Indeterminate large mammal
Elements Fragments
23 Other

Odocoileus virginianus
Elements Fragments
4 1 Other

Indeterminate bird
Elements Fragments
2 Other

Meleagris gallopavo
Elements Fragments
2 Other

Indeterminate turtle
Elements Fragments
9 Other

Terrapene carolina
Elements Fragments
1 Other

Rana/Bufo sp.
Elements Fragments
1 Other

Moxostoma sp.
Elements Fragments
1 Other

Ictalurus sp.
Elements Fragments
1 Other

Feature 8

Feature 8

Blanks
1 Stage 2
3008-17,

Perforators
1 Category 2
3008- 0,

Adzes
2 Ground stone
3008- 5,3008- 5,

Axes
1
3008- 0,

Preforms
2 Stage 2
3008-14,3008-19,
1 Stage 3
3008- 9,

Drills
1 On a projectile point
3008-13,
1 On a finished biface
3008- 8,

Projectile points
1 Category 17
3008- 7,

Cores
    2   Subconical
          3008- 4,3008-27,

Hammerstones
    1
          3008- 6,

Utilized flakes
    5   Bifacial thinning flake
          3008- 0,3008- 0,3008-30,3008-32,3008-37,

Preform/blank/bifacial fragments
    1   Indeterminate biface fragment
          3008- 0,
    1   Medial portion
          3008-15,
    3   Blank fragment
          3008-10,3008-16,3008-39,

Projectile point fragments
    3   Distal
          3008- 0,3008-20,3008-21,
    2   Medial
          3008-25,3008-26,

Indeterminate large mammal

Elements	Fragments	
	202	Other

Indeterminate small mammal

Elements	Fragments	
	1	Other

Odocoileus virginianus

Elements	Fragments	
5		Dental
24	7	Other

Procyon lotor

Elements	Fragments	
2		Dental
1		Other

Indeterminate bird

Elements	Fragments	
	20	Other

Corvus corax

Elements	Fragments	
	1	Other

Meleagris gallopavo
Elements Fragments
1 Other

Indeterminate turtle
Elements Fragments
18 Other

Terrapene carolina
Elements Fragments
5 Other

Indeterminate fish
Elements Fragments
4 Other

Feature 9 Feature 9

Preform/blank/bifacial fragments
1 Medial portion
3009- 1,

Feature 10 Feature 10

Projectile points
1 Category 4
3010- 1,

Preform/blank/bifacial fragments
1 Indeterminate biface fragment
3010- 3,

Feature 11 Feature 11

Blanks
1 Stage 2
3011-13,
1 Stage 3
3011- 5,

Perforators
1 Category 1
3011- 0,

Preforms
1 Stage 2
3011- 9,

Projectile points
1 Category 17
3011- 1,
1 Category 21
3011- 2,

Miscellaneous
1 Ground stone fragment
3011-16,
1 Boatstone
3011-17,

Utilized flakes
1 Bifacial thinning flake
3011-12,

Preform/blank/bifacial fragments
1 Proximal portion
3011- 6,
1 Medial portion
3011-15,
3 Distal portion
3011- 4,3011- 7,3011-11,
1 Blank fragment
3011-14,

Projectile point fragments
1 Medial
3011- 9,

Indeterminate large mammal

Elements	Fragments	
	132	Other

Indeterminate small mammal

Elements	Fragments	
	1	Other

Homo sapiens

Elements	Fragments	
3		Other

Odocoileus virginianus

Elements	Fragments	
1		Dental
13	1	Other

Sciurus carolinensis

Elements	Fragments	
1		Other

Didelphus marsupialis
Elements Fragments
1 Other

Indeterminate bird
Elements Fragments
1 Other

Meleagris gallopavo
Elements Fragments
2 Other

Indeterminate turtle
Elements Fragments
4 Other

Terrapene carolina
Elements Fragments
2 Other

Indeterminate fish
Elements Fragments
1 Other

Feature 12

Feature 12

Preforms
1 Stage 1
3012- 4,

Projectile points
1 Category 21
3012- 1,

Cores
1 Amorphous
3012- 8,
1 Discoidal
3012- 7,

Utilized flakes
1 Bifacial thinning flake
3012- 9,

Projectile point fragments
1 Distal
3012- 3,

Indeterminate mammal
Elements Fragments
14 Other

Indeterminate large mammal

Elements	Fragments	
	84	Other

Odocileus virginianus

Elements	Fragments	
5	22	Antler
2		Dental
21	6	Other

Cervus canadensis

Elements	Fragments	
4		Dental
6		Other

Procyon lotor

Elements	Fragments	
1		Dental
3		Other

Canis sp.

Elements	Fragments	
2		Other

Indeterminate bird

Elements	Fragments	
	1	Other

Meleagris gallopavo

Elements	Fragments	
1		Other

Indeterminate turtle

Elements	Fragments	
	27	Other

Terrapene carolina

Elements	Fragments	
37		Other

Indeterminate fish

Elements	Fragments	
2		Other

Catostomidae

Elements	Fragments	
1		Other

Ictalurus punctatus

Elements	Fragments	
5		Other

Aplodinotus grunniens
Elements Fragments
1 Other

Feature 13 **Feature 13**

Blanks
- 1 Stage 2
  - 3013-20,
- 1 Stage 4
  - 3013- 6,

Preforms
- 2 Stage 2
  - 3013- 1, 3013- 3,
- 1 Stage 3
  - 3013-12,

Drills
- 1 Indeterminate
  - 3013-16,

Projectile points
- 1 Category 0
  - 3013-15,
- 2 Category 8
  - 3013- 9, 3013-13,
- 1 Category 13
  - 3013- 5,
- 1 Category 22
  - 3013-10,

Cores
- 1 Subconical
  - 3013-21,

Notched flakes
- 1 On a biface
  - 3013-14,

Miscellaneous
- 1 Crinoid stem
  - 3013- 0,

Utilized flakes
- 1 Bifacial thinning flake
  - 3013-18,

Preform/blank/bifacial fragments
2 Indeterminate biface fragment
3013-19,3013-19,
1 Medial portion
3013- 2,
1 Distal portion
3013- 7,

Projectile point fragments
2 Distal
3013- 4,3013-11,

Feature 14

Axes
1
3014- 4,

Preforms
2 Stage 2
3014- 1,3014- 2,

Cores
1 Amorphous
3014- 6,

Hammerstones
1
3014- 5,

Projectile point fragments
1 Distal
3014- 3,

Indeterminate mammal

Elements	Fragments	
	63	Other

Indeterminate large mammal

Elements	Fragments	
	22	Other

Indeterminate medium mammal

Elements	Fragments	
1		Dental
	13	Other

Odocileus virginianus

Elements	Fragments	
1		Antler
6		Other

Indeterminate bird
Elements Fragments
3 Other

Indeterminate turtle
Elements Fragments
1 Other

Terrapene carolina
Elements Fragments
1 Other

Trionyx spiniferus
Elements Fragments
3 Other

Rana/*Bufo* sp.
Elements Fragments
1 Other

Indeterminate mussel
Elements Fragments
1 Other

Feature 15

Feature 15

Spalls
1
3015- 2,

Projectile points
1 Category 22
3015- 1,

Feature 16

Feature 16

Preforms
1 Stage 2
3016- 2,

Projectile points
1 Category 3
3016- 1,
1 Category 9
3016- 3,

Cores
1 Discoidal
3016- 6,

Preform/blank/bifacial fragments
1 Medial portion
3016-10,
1 Distal portion
3016- 4,

Indeterminate large mammal

Elements	Fragments	
1		Dental
	46	Other

__Odocoileus virginianus__

Elements	Fragments	
1		Antler
1		Dental
4	3	Other

__Marmota monax__

Elements	Fragments	
1		Dental

Indeterminate bird

Elements	Fragments	
	4	Other

Indeterminate turtle

Elements	Fragments	
	3	Other

__Terrapene carolina__

Elements	Fragments	
3		Other

__Aplodinotus grunniens__

Elements	Fragments	
1		Other

__Feature 17__ __Feature 17__

Preforms
1 Stage 3
3017- 6,

Projectile points
1 Category 3
3017- 4,
1 Category 8
3017- 5,
1 Category 9
3017- 1,

Preform/blank/bifacial fragments

2 Indeterminate biface fragment
3017-10, 3017-18,

1 Distal portion
3017- 2,

Indeterminate mammal

Elements	Fragments	
	2	Other

Indeterminate large mammal

Elements	Fragments	
	61	Other

Odocoileus virginianus

Elements	Fragments	
1		Dental
3		Other

Urocyon cinereoargenteus

Elements	Fragments	
1		Other

Sylvilagus floridanus

Elements	Fragments	
1		Dental

Indeterminate bird

Elements	Fragments	
	4	Other

Strix varia

Elements	Fragments	
1		Other

Meleagris gallopavo

Elements	Fragments	
	1	Other

Indeterminate turtle

Elements	Fragments	
	4	Other

Crotalidae

Elements	Fragments	
3		Other

Terrapene carolina

Elements	Fragments	
	1	Other

Indeterminate fish

Elements	Fragments	
	1	Other

Feature 18 Feature 18

Preforms
1 Stage 3
3018- 4,

Cores
1 Amorphous
3018- 8,

Utilized flakes
7 Bifacial thinning flake
3018- 0,3018- 0,3018- 0,3018- 0,3018- 0,3018- 0
3018- 0,

Preform/blank/bifacial fragments
1 Medial portion
3018- 2,

Projectile point fragments
1 Distal
3018- 1,

Indeterminate large mammal

Elements	Fragments	
	152	Other

Indeterminate small mammal

Elements	Fragments	
2		Other

Odocoileus virginianus

Elements	Fragments	
2	2	Dental
7	2	Other

Sciurus carolinensis

Elements	Fragments	
1		Dental

Sylvilagus floridanus

Elements	Fragments	
1		Other

Meleagris gallopavo

Elements	Fragments	
	2	Other

Indeterminate turtle
Elements Fragments
1 3 Other

Terrapene carolina
Elements Fragments
3 Other

Indeterminate fish
Elements Fragments
3 Other

Feature 19

Feature 19

Preforms
1 Stage 3
3019- 2,

Projectile points
1 Category 22
3019- 1,

Indeterminate mammal
Elements Fragments
1 Other

Indeterminate large mammal
Elements Fragments
13 Other

Odocileus virgirianus
Elements Fragments
3 Other

Indeterminate bird
Elements Fragments
2 Other

Indeterminate turtle
Elements Fragments
4 Other

Feature 20

Feature 20

Utilized flakes
1 Bifacial thinning flake
3020- 0,

Preform/blank/bifacial fragments
1 Indeterminate biface fragment
3020- 0,
1 Blank fragment
3020- 1,

Indeterminate

Elements	Fragments	
1		Other

Indeterminate mammal

Elements	Fragments	
	19	Other

Odocileus virginianus

Elements	Fragments	
1	2	Other

Procyon lotor

Elements	Fragments	
1		Other

Sciurus carolinensis

Elements	Fragments	
	1	Dental

Indeterminate bird

Elements	Fragments	
	5	Other

Indeterminate fish

Elements	Fragments	
	2	Other

Feature 21 Feature 21

Indeterminate mammal

Elements	Fragments	
	10	Other

Odocileus virginianus

Elements	Fragments	
2		Dental
1	1	Other

Feature 22 Feature 22

Blanks
1 Stage 3
3022-12,

Preforms
- 2 Stage 1
  - 3022- 7,3022-11,
- 3 Stage 3
  - 3022- 2,3022-21,3022-27,

Drills
- 1 On a finished biface
  - 3022-20,
- 1 On a rough biface
  - 3022- 8,

Projectile points
- 1 Category 3
  - 3022-16,
- 1 Category 13
  - 3022-19,
- 1 Category 19
  - 3022-17,
- 1 Category 22
  - 3022- 3,

Miscellaneous
- 1 Ground stone bead
  - 3022- 4,
- 4 Limestone temp. sherd
  - 3022-28,3022-29,3022-30,3022-31,

Utilized flakes
- 1 Bifacial thinning flake
  - 3022-29,

Preform/blank/bifacial fragments
- 3 Distal portion
  - 3022-10,3022-15,3022-22,

Projectile point fragments
- 6 Distal
  - 3022- 1,3022- 9,3022-14,3022-19,3022-23,3022-24

Indeterminate mammal

Elements	Fragments	
	54	Other

Indeterminate large mammal

Elements	Fragments	
	17	Other

<u>Odocileus virginianus</u>

Elements	Fragments	
6		Dental

11 Cther

Sylvilagus floridanus
Elements Fragments
2 Other

Indeterminate bird
Elements Fragments
5 Cther

Meleagris gallopavc
Elements Fragments
1 Other

Indeterminate turtle
Elements Fragments
11 Cther

Terrapene carolina
Elements Fragments
1 Other

Rana catesbeiana
Elements Fragments
1 Cther

Feature 23

Feature 23

Blanks
1 Stage 1
3023- 1,
1 Stage 2
3023- 2,
2 Stage 3
3023- 3,3023- 8,

Preforms
2 Stage 3
3023- 4,3023-10,

Projectile pcints
1 Category 0
3023- 6,
1 Category 9
3023-12,
1 Category 21
3023- 7,
1 Category 33
3023- 9,

Preform/blank/bifacial fragments
1 Indeterminate biface fragment
3023-11,

Projectile point fragments
1 Distal
3023- 5,

Indeterminate mammal

Elements	Fragments	
1	2	Other

Indeterminate large mammal

Elements	Fragments	
	102	Other

Odocileus virginianus

Elements	Fragments	
1		Antler
8		Dental
20	2	Other

Indeterminate bird

Elements	Fragments	
	1	Other

Meleagris gallopavo

Elements	Fragments	
2		Other

Indeterminate turtle

Elements	Fragments	
	1	Other

Terrapene carolina

Elements	Fragments	
7	3	Other

Feature 24

Feature 24

Preforms
1 Stage 3
3024- 1,

Odocileus virginianus

Elements	Fragments	
1		Other

Feature 25

Blanks
1 Stage 1
3025-15,

Projectile points
1 Category 3
3025- 4,
1 Category 13
3025- 9,
1 Category 17
3025- 1,
1 Category 19
3025- 2,
1 Category 25
3025- 3,

Cores
1 Subconical
3025- 8,
1 Blade
3025-14,

Utilized flakes
1 Bifacial thinning flake
3025- 0,

Projectile point fragments
1 Distal
3025- 0,

Indeterminate mammal

Elements	Fragments	
2	41	Other

Indeterminate large mammal

Elements	Fragments	
	227	Other

Odocoileus virginianus

Elements	Fragments	
11	3	Dental
82	11	Other

Mephitis mephitis

Elements	Fragments	
1		Dental

Procyon lotor
Elements Fragments
1 Other

Ursus americanus
Elements Fragments
1 Other

Marmota monax
Elements Fragments
1 Dental

Indeterminate bird
Elements Fragments
71 Other

Meleagris gallopavo
Elements Fragments
22 2 Other

Indeterminate turtle
Elements Fragments
4 Other

Crotalidae
Elements Fragments
1 Other

Terrapene carolina
Elements Fragments
4 Other

Indeterminate fish
Elements Fragments
2 Other

Catostomidae
Elements Fragments
1 Other

Feature 26

Feature 26

Perforators
1 Category 1
3026- 0,

Preforms
1 Stage 1
3026- 4,

1 Stage 3
3026- 3,

Drills
1 Indeterminate
3026- 1,
1 On a finished biface
3026- 2,

Utilized flakes
1 Bifacial thinning flake
3026- 0,

Preform/blank/bifacial fragments
1 Proximal portion
3026- 5,

Projectile point fragments
1 Distal
3026- 0,

Indeterminate mammal

Elements	Fragments	
	21	Other

Odocoileus virginianus

Elements	Fragments	
	1	Dental
3		Other

Erethizon dorsatum

Elements	Fragments	
1		Dental

Indeterminate bird

Elements	Fragments	
	3	Other

Indeterminate turtle

Elements	Fragments	
	2	Other

Moxostoma sp.

Elements	Fragments	
	1	Other

Feature 27

Feature 27

Blanks
2 Stage 1
3027- 4,3027-13,

1 Stage 2
3027-10,

Preforms
1 Stage 1
3027- 9,
2 Stage 2
3027- 5, 3027-12,

Drills
1 On a finished biface
3027- 8,

Projectile points
1 Category 23
3027- 6,

Cores
1 Amorphous
3027-11,

Hammerstones
1
3027-14,

Utilized flakes
1 Bifacial thinning flake
3027- 7,

Preform/blank/bifacial fragments
1 Blank fragment
3027- 2,

Projectile point fragments
1 Medial
3027- 3,
1 Proximal
3027-18,

<u>Feature 28</u>

<u>Feature 28</u>

Indeterminate large mammal

Elements	Fragments	
	8	Other

Odocileus virginianus

Elements	Fragments	
1		Antler

Procyon lotor

Elements	Fragments	
1		Other

Indeterminate turtle
Elements Fragments
2 Other

Indeterminate fish
Elements Fragments
1 Other

<u>Feature 29</u> <u>Feature 29</u>

Knives
1 Triangular/rounded base
3029- 1,

Spalls
1
3029- 2,

Preform/blank/bifacial fragments
1 Blank fragment
3029- 3,

Indeterminate large mammal
Elements Fragments
6 Other

<u>Odocileus virgirianus</u>
Elements Fragments
3 2 Other

<u>Terrapene carolina</u>
Elements Fragments
3 Other

<u>Feature 30</u> <u>Feature 30</u>

Indeterminate large mammal
Elements Fragments
1 Other

<u>Feature 31</u> <u>Feature 31</u>

Preform/blank/bifacial fragments
2 Indeterminate biface fragment
3031- 2,3031- 2,

<u>Feature 33</u> <u>Feature 33</u>

Blanks
    1 Stage 2
        3033- 8,

Knives
    1 Stemmed
        3033- 5,
    1 Triangular/rounded base
        3033- 7,

Projectile points
    1 Category 8
        3033-19,
    1 Category 16
        3033-12,

Cores
    1 Amorphous
        3033-10,

Utilized flakes
    1 Decortication flake
        3033-17,
    2 Bifacial thinning flake
        3033-11,3033-15,

Preform/blank/bifacial fragments
    4 Indeterminate biface fragment
        3033-14,3033-14,3033-16,3033-16,
    1 Distal portion
        3033- 9,

Projectile point fragments
    1 Distal
        3033- 1,

Indeterminate mammal

Elements	Fragments	
	1	Dental
	55	Other

Homo sapiens

Elements	Fragments	
1		Other

Odocoileus virginianus

Elements	Fragments	
2		Dental
7	3	Other

Meleagris gallopavo
Elements Fragments
1 Other

Indeterminate turtle
Elements Fragments
2 Other

Terrapene carolina
Elements Fragments
3 Other

Trionyx spiniferus
Elements Fragments
1 Other

Rana catesbeiana
Elements Fragments
1 Other

Rana/Bufo sp.
Elements Fragments
5 2 Other

Feature 34

Feature 34

Preforms
1 Stage 1
3034- 6,
1 Stage 3
3034- 1,

Projectile points
1 Category 17
3034- 4,
1 Category 27
3034-14,

Cores
2 Amorphous
3034-11,3034-12,

Utilized flakes
3 Bifacial thinning flake
3034- 0,3034- 0,3034- 9,
1 Shatter fragment
3034-16,

Preform/blank/bifacial fragments
    3 Indeterminate biface fragment
        3034- 0,3034- 7,3034- 7,
    1 Distal portion
        3034- 2,

Projectile point fragments
    4 Distal
        3034- 0,3034- 3,3034- 5,3034-13,
    1 Medial
        3034- 8,

Indeterminate large mammal

Elements	Fragments	
	35	Other

Odocoileus virginianus

Elements	Fragments	
3	1	Dental
5	1	Other

Indeterminate bird

Elements	Fragments	
	4	Other

Meleagris gallopavo

Elements	Fragments	
1		Other

Terrapene carolina

Elements	Fragments	
7	1	Other

Moxostoma sp.

Elements	Fragments	
1		Other

Feature 35

Feature 35

Blanks
    2 Stage 1
        3035- 7,3035- 8,
    3 Stage 3
        3035- 6,3035-10,3035-13,
    1 Stage 4
        3035- 3,

Scrapers
    1 Unifacial end scraper
        3035-30,

Preforms
3 Stage 2
3035-13, 3035-14, 3035-14,
3 Stage 3
3035-15, 3035-16, 3035-37,

Projectile points
1 Category 14
3035-19,

Cores
1 Amorphous
3035-31,

Miscellaneous
1 Ground stone gorget
3035- 4,
1 Perforator/graver
3035- 0,

Utilized flakes
1 Decortication flake
3035- 0,
3 Bifacial thinning flake
3035- 0, 3035-23, 3035-42,

Preform/blank/bifacial fragments
1 Medial portion
3035-38,
2 Distal portion
3035- 9, 3035-17,
4 Blank fragment
3035-12, 3035-18, 3035-21, 3035-36,

Projectile point fragments
3 Distal
3035- 5, 3035-34, 3035-35,
1 Medial
3035-11,

Indeterminate mammal

Elements	Fragments	
	18	Other

Odocoileus virginianus

Elements	Fragments	
10		Other

Indeterminate turtle

Elements	Fragments	
	8	Other

Chelydra serpentina
Elements Fragments
1 Other

Terrapene carolina
Elements Fragments
5 Other

Trionyx spiniferus
Elements Fragments
2 Other

Indeterminate fish
Elements Fragments
1 Other

Feature 36

Blanks
2 Stage 1
3036- 2,3036-11,

Preforms
1 Stage 3
3036- 5,

Projectile points
1 Category 14
3036- 6,
1 Category 33
3036- 4,

Utilized flakes
1 Decortication flake
3036- 9,

Preform/blank/bifacial fragments
1 Distal portion
3036- 3,

Indeterminate large mammal
Elements Fragments
19 Other

Indeterminate medium mammal
Elements Fragments
1 Other

Odocoileus virginianus
Elements Fragments
9 Other

Cervus canadensis
Elements Fragments
2 Other

Marmota monax
Elements Fragments
1 Other

Terrapene carolina
Elements Fragments
2 3 Other

Feature 37

Feature 37

Preform/blank/bifacial fragments
1 Blank fragment
3037- 0,

Projectile point fragments
2 Distal
3037- 0,3037- 0,

Indeterminate large mammal
Elements Fragments
11 Other

Moxostoma sp.
Elements Fragments
1 Other

Feature 38

Feature 38

Projectile points
1 Category 17
3038- 1,

Hammerstones
1
3038- 4,

Preform/blank/bifacial fragments
2 Indeterminate biface fragment
3038- 0,3038- 0,
1 Blank fragment
3038- 2,

Projectile point fragments
1 Distal
3038- 3,

Indeterminate large mammal

Elements	Fragments	
	17	Other

Odocileus virginianus

Elements	Fragments	
3		Other

Indeterminate bird

Elements	Fragments	
	1	Other

Terrapene carolina

Elements	Fragments	
1	2	Other

Feature 39

Feature 39

Spalls
1
3039- 2,

Projectile points
1 Category 21
3039- 3,

Miscellaneous
1 Crinoid stem
3039- 4,

Preform/blank/bifacial fragments
1 Indeterminate biface fragment
3039- 5,

Indeterminate mammal

Elements	Fragments	
	13	Other

Odocileus virginianus

Elements	Fragments	
1		Dental
2		Other

Procyon lotor

Elements	Fragments	
1		Other

Indeterminate turtle

Elements	Fragments	
	5	Other

Indeterminate fish
Elements Fragments
1 Other

Feature 40 Feature 40

Blanks
1 Stage 2
3040- 3,

Preforms
1 Stage 2
3040- 9,
2 Stage 3
3040-13,3040-22,

Projectile points
1 Category 11
3040- 5,
1 Category 22
3040-17,

Cores
1 Subconical
3040-25,
3 Amorphous
3040- 2,3040- 7,3040-19,
1 Discoidal
3040- 1,

Notched flakes
1 On a flake
3040- 0,

Utilized flakes
1 Decortication flake
3040-10,
8 Bifacial thinning flake
3040- 0,3040- 0,3040- 6,3040-21,3040-23,3040-24
3040-27,3040-29,

Preform/blank/bifacial fragments
2 Indeterminate biface fragment
3040-16,3040-16,
2 Proximal portion
3040-14,3040-15,
2 Blank fragment
3040-18,3040-30,

Projectile point fragments
3 Distal
3040- 0,3040- 0,3040- 8,

Indeterminate large mammal

Elements	Fragments	
35		Other

Odocileus virginianus

Elements	Fragments	
3		Dental
22	1	Other

Castor canadensis

Elements	Fragments	
1		Other

Indeterminate bird

Elements	Fragments	
	3	Other

Terrapene carolina

Elements	Fragments	
6		Other

Feature 41 Feature 41

Projectile points
1 Category 17
3041- 1,

Feature 42 Feature 42

Blanks
1 Stage 1
3042-11,
1 Stage 2
3042- 2,

Perforators
2 Category 1
3042- 0,3042- 0,

Projectile points
1 Category 13
3042-10,
1 Category 14
3042- 6,
1 Category 22
3042- 8,

1 Category 23
3042- 5,
1 Category 26
3042- 9,

Cores
1 Amorphous
3042-13,

Hammerstones
1
3042- 0,

Utilized flakes
1 Decortication flake
3042- 0,
1 Bifacial thinning flake
3042-12,

Preform/blank/bifacial fragments
1 Indeterminate biface fragment
3042-15,
1 Distal portion
3042- 7,
1 Blank fragment
3042- 3,

Indeterminate mammal

Elements	Fragments	
	12	Other

Indeterminate large mammal

Elements	Fragments	
	19	Other

Odocoileus virginianus

Elements	Fragments	
4	3	Other

Lynx rufus

Elements	Fragments	
1		Dental

Indeterminate bird

Elements	Fragments	
	6	Other

Indeterminate turtle

Elements	Fragments	
	3	Other

Chrysemys/Graptemys sp.
Elements Fragments
1 Other

Terrapene carolina
Elements Fragments
2 Other

Feature 43

Perforators
1 Category 1
3043- 0,
1 Category 2
3043- 0,

Preforms
1 Stage 1
3043- 3,
1 Stage 2
3043- 4,

Projectile points
1 Category 13
3043- 5,

Utilized flakes
2 Decortication flake
3043- 0,3043- 8,
4 Bifacial thinning flake
3043- 0,3043- 0,3043- 0,3043- 0,

Preform/blank/bifacial fragments
2 Indeterminate biface fragment
3043- 6,3043- 6,

Projectile point fragments
1 Distal
3043- 3,

Indeterminate mammal
Elements Fragments
3 Other

Indeterminate large mammal
Elements Fragments
30 Other

Homo sapiens
Elements Fragments
2 Other

Odocileus virginianus

Elements	Fragments	
2	1	Dental
3	1	Other

Meleagris gallcravc

Elements	Fragments	
	3	Cther

Indeterminate turtle

Elements	Fragments	
	1	Other

Terrapene carolina

Elements	Fragments	
2		Cther

Feature 45

Feature 45

Indeterminate large mammal

Elements	Fragments	
	6	Cther

Odocileus virginiarus

Elements	Fragments	
2	1	Other

Feature 46

Feature 46

Elanks
1 Stage 4
3046- 1,

Drills
1 On a finished biface
3046- 2,

Projectile pcints
1 Categcry 21
3046- 4,

Utilized flakes
1 Eifacial thinning flake
3046- 0,

Projectile pcint fragments
2 Distal
3046- C,3046- 3,

Indeterminate large mammal
  Elements Fragments
                    3   Other

Indeterminate bird
  Elements Fragments
                    1   Other

<u>Feature 47</u>

<u>Feature 47</u>

Blanks
    1 Stage 2
         3047- 3,
    1 Stage 3
         3047- 2,

Preforms
    1 Indeterminate
         3047- 2,
    1 Stage 3
         3047- 8,

Drills
    1 On a projectile point
         3047-12,

Projectile points
    1 Category 3
         3047- 4,
    1 Category 18
         3047- 9,
    1 Category 21
         3047- 5,
    1 Category 22
         3047- 7,
    1 Category 25
         3047- 6,

Utilized flakes
    1 Bifacial thinning flake
         3047-10,

Projectile point fragments
    2 Distal
         3047-11,3047-14,

Indeterminate
  Elements Fragments
                    1   Other

Indeterminate large mammal

Elements	Fragments	
	33	Cther

Odocileus virginianus

Elements	Fragments	
1		Dental
5		Cther

Marmota monax

Elements	Fragments	
1		Dental

Indeterminate bird

Elements	Fragments	
	4	Cther

Meleagris gallopavc

Elements	Fragments	
2		Other

Feature 48

Feature 48

Miscellaneous
1 Crincid stem
3048- 5,

Indeterminate large mammal

Elements	Fragments	
	2	Cther

Odocileus virginianus

Elements	Fragments	
1		Other

Feature 49

Feature 49

Indeterminate large mammal

Elements	Fragments	
	15	Other

Odocileus virginianus

Elements	Fragments	
1		Dental
6		Other

Indeterminate turtle

Elements	Fragments	
	1	Cther

Terrapene carolina
Elements Fragments
1 Other

Indeterminate fish
Elements Fragments
1 Other

Feature 50 Feature 50

Scrapers
1 Unifacial end scraper
3050- 0,

Hammerstones
1
3050- 1,

Indeterminate large mammal
Elements Fragments
19 Other

Odocoileus virginianus
Elements Fragments
8 3 Other

Indeterminate bird
Elements Fragments
5 Other

Meleagris gallopavo
Elements Fragments
2 Other

Feature 51 Feature 51

Projectile points
1 Category 17
3051- 0,

Cores
1 Subconical
3051- 2,

Projectile point fragments
2 Distal
3051- 4, 3051- 5,

Indeterminate mammal
Elements Fragments
31 Other

Odocileus virginiarts

Elements	Fragments	
1	1	Antler
5		Cther

Indeterminate bird

Elements	Fragments	
	2	Other

Terrapene carclina

Elements	Fragments	
	2	Cther

Chrysemys scripta

Elements	Fragments	
1		Other

Indeterminate fish

Elements	Fragments	
	1	Cther

Feature 52

Feature 52

Blarks
- 1 Stage 2
  - 3052- 1,

Preforms
- 1 Stage 1
  - 3052- 5,
- 1 Stage 3
  - 3052- 8,

Projectile pcints
- 1 Category 14
  - 3052- 3,

Projectile point fragments
- 2 Distal
  - 3052- 6, 3052- 7,

Indeterminate mammal

Elements	Fragments	
	3	Cther

Indeterminate large mammal

Elements	Fragments	
	26	Cther

Odocoileus virginianus
Elements Fragments
8 Other

Indeterminate bird
Elements Fragments
4 Other

Terrapene carolina
Elements Fragments
1 Other

Trionyx spiniferus
Elements Fragments
1 Other

Feature 53

Feature 53

Blanks
1 Stage 1
3053-20,

Knives
1 Stemmed
3053- 6,

Projectile points
1 Category 4
3053- 5,
1 Category 9
3053- 7,
1 Category 13
3053- 2,
1 Category 15
3053- 8,

Cores
1 Amorphous
3053-16,

Utilized flakes
2 Bifacial thinning flake
3053- 0,3053- 0,

Preform/blank/bifacial fragments
1 Proximal portion
3053- 9,
1 Distal portion
3053- 3,

2 Blank fragment
3053-21,3053-22,

Projectile point fragments
5 Distal
3053- 3,3053-10,3053-11,3053-14,3053-19,
4 Medial
3053-12,3053-13,3053-15,3053-23,

Indeterminate

Elements	Fragments	
	1	Other

Indeterminate mammal

Elements	Fragments	
	9	Other

Indeterminate large mammal

Elements	Fragments	
	118	Other

Odocileus virginianus

Elements	Fragments	
1		Antler
4		Dental
35	12	Other

Procyon lotor

Elements	Fragments	
1		Other

Marmota monax

Elements	Fragments	
1		Dental
1	1	Other

Meleagris gallopavo

Elements	Fragments	
1		Other

Accipiter cooperii

Elements	Fragments	
2		Other

Terrapene carolina

Elements	Fragments	
24		Other

Indeterminate fish

Elements	Fragments	
	1	Other

Moxostoma cf. *carinatum*

Elements	Fragments	
1		Dental

Feature 54

Blanks
    1 Stage 1
        3054- 5,

Knives
    1 Flake
        3054- 6,

Preforms
    2 Stage 1
        3054- 3,3054- 4,
    1 Stage 3
        3054- 9,

Projectile points
    1 Category 24
        3054- 7,

Cores
    3 Amorphous
        3054- 0,3054- 1,3054-12,

Miscellaneous
    1 Crinoid stem
        3054-14,

Utilized flakes
    1 Bifacial thinning flake
        3054- 0,

Preform/blank/bifacial fragments
    1 Indeterminate biface fragment
        3054- 0,
    1 Medial portion
        3054- 2,
    1 Blank fragment
        3054-13,

Projectile point fragments
    1 Distal
        3054- 8,

Indeterminate mammal

Elements	Fragments	
	31	Other

Indeterminate large mammal

Elements	Fragments	
	48	Other

<u>Odocileus virginianus</u>

Elements	Fragments	
4		Dental
28	16	Other

<u>Sylvilagus floridanus</u>

Elements	Fragments	
1		Dental

Indeterminate bird

Elements	Fragments	
	1	Other

Indeterminate turtle

Elements	Fragments	
	3	Other

<u>Feature 55</u>

<u>Feature 55</u>

Projectile points
- 1 Category 26
  - 3055- 1,

Utilized flakes
- 1 Decortication flake
  - 3055- 0,
- 2 Bifacial thinning flake
  - 3055- 0, 3055- 0,

Indeterminate mammal

Elements	Fragments	
	27	Other

<u>Odocileus virginianus</u>

Elements	Fragments	
2	1	Other

<u>Cervus canadensis</u>

Elements	Fragments	
1		Other

<u>Meleagris gallopavo</u>

Elements	Fragments	
1		Other

Terrapene carolina
Elements Fragments
3 Other

Feature 56

Feature 56

Indeterminate large mammal
Elements Fragments
2 Other

Odocileus virginianus
Elements Fragments
1 Other

Feature 57

Feature 57

Drills
1 On a finished biface
3057- 1,

Miscellaneous
1 Perforator/denticulate
3057- 0,

Utilized flakes
1 Bifacial thinning flake
3057- 2,

Indeterminate mammal
Elements Fragments
3 Other

Indeterminate large mammal
Elements Fragments
1 Other

Homo sapiens
Elements Fragments
1 Other

Odocileus virginianus
Elements Fragments
1 Other

Indeterminate turtle
Elements Fragments
1 Other

Trionyx spiniferus
Elements Fragments
2 Other

Feature 58

Feature 58

Projectile pcints
1 Categcry 0
3058- 1,

Projectile pcint fragments
1 Distal
3058- 4,

Indeterminate mammal
Elements Fragments
8 Other

Odocileus virginiants
Elements Fragments
3 Cther

Ursus americanus
Elements Fragments
1 Other

Meleagris gallcpavc
Elements Fragments
1 Other

Terrapene carclina
Elements Fragments
3 Cther

Feature 59

Feature 59

Spalls
1
3059- 4,

Preforms
1 Stage 3
3059- 6,

Miscellanecus
1 Denticulate
3059- 0,

Utilized flakes
1 Decorticaticn flake
3059- 0,
1 Bifacial thinning flake
3059- 0,

Preform/blank/bifacial fragments
3 Indeterminate biface fragment
3059- 5,3059- 7,3059- 7,
1 Medial portion
3059- 2,
1 Distal portion
3059- 5,

Projectile point fragments
2 Distal
3059- 1,3059- 3,

Indeterminate mammal

Elements	Fragments	
	1	Other

Indeterminate large mammal

Elements	Fragments	
	30	Other

Odocoileus virginianus

Elements	Fragments	
2	1	Other

Meleagris gallopavo

Elements	Fragments	
1	1	Other

Terrapene carolina

Elements	Fragments	
1		Other

Feature 60

Feature 60

Perforators
1 Category 1
3060- 1,

Indeterminate mammal

Elements	Fragments	
	1	Other

Indeterminate large mammal

Elements	Fragments	
	4	Other

Odocoileus virginianus

Elements	Fragments	
7		Other

Feature 61

Preforms
1 Stage 3
3061- 4,

Projectile pcints
1 Category 26
3061- 3,

Utilized flakes
1 Decorticaticn flake
3061- 6,
1 Bifacial thinning flake
3061- 0,

Preform/blank/bifacial fragments
1 Indeterminate biface fragment
3061- 1,

Projectile point fragments
1 Distal
3061- 2,
1 Proximal
3061- 5,

Indeterminate large mammal

Elements	Fragments	
	6	Cther

Odocileus virginianus

Elements	Fragments	
2		Other

Indeterminate bird

Elements	Fragments	
	5	Cther

Meleagris gallopavc

Elements	Fragments	
2		Other

Indeterminate turtle

Elements	Fragments	
	1	Cther

Feature 62

Feature 62

Indeterminate large mammal

Elements	Fragments	
	4	Cther

Odocileus virginianus
Elements Fragments
1 Other

Indeterminate bird
Elements Fragments
2 Other

Feature 63

Feature 63

Blanks
1 Stage 2
3063- 5,

Preforms
1 Stage 2
3063- 3,

Projectile points
1 Category 1
3063- 4,
1 Category 29
3063- 1,

Preform/blank/bifacial fragments
2 Indeterminate biface fragment
3063- 6, 3063- 6,
1 Distal portion
3063- 7,

Indeterminate mammal
Elements Fragments
16 Other

Odocileus virginianus
Elements Fragments
1 Dental
2 2 Other

Canis familiaris
Elements Fragments
2 Other

Sciurus carolinensis
Elements Fragments
1 Dental

Indeterminate bird
Elements Fragments
1 Other

Indeterminate turtle
Elements Fragments
3 Other

Feature 64

Feature 64

Projectile points
1 Category 10
3064- 1,
1 Category 13
3064- 2,

Projectile point fragments
1 Distal
3064- 3,

Indeterminate large mammal
Elements Fragments
7 Other

Odocileus virginianus
Elements Fragments
3 Other

Indeterminate turtle
Elements Fragments
2 Other

Feature 65

Feature 65

Indeterminate large mammal
Elements Fragments
4 Other

Feature 66

Feature 66

Utilized flakes
1 Decortication flake
3066- 0,

Odocileus virginianus
Elements Fragments
1 2 Other

Feature 68

Feature 68

Indeterminate large mammal
Elements Fragments
2 Other

Odocileus virginianus

Elements	Fragments	
1	1	Dental

<u>Feature 69</u>

<u>Feature 69</u>

Preforms
1 Stage 3
3069- 1,

Indeterminate large mammal

Elements	Fragments	
	7	Other

Odocileus virginianus

Elements	Fragments	
1		Antler
2	1	Dental

Meleagris gallopavo

Elements	Fragments	
1		Other

Terrapene carolina

Elements	Fragments	
1		Other

<u>Feature 70</u>

<u>Feature 70</u>

Indeterminate mammal

Elements	Fragments	
	2	Other

Indeterminate medium mammal

Elements	Fragments	
1		Other

<u>Feature 71</u>

<u>Feature 71</u>

Blanks
1 Stage 1
3071- 2,

Indeterminate mammal

Elements	Fragments	
	2	Other

Indeterminate bird

Elements	Fragments	
	1	Other

Terrapene carolina
Elements Fragments
1 Other

Feature 72

Feature 72

Indeterminate large mammal
Elements Fragments
3 Other

Odocoileus virginianus
Elements Fragments
3 Other

Feature 73

Feature 73

Preforms
1 Stage 1
3073- 1,

Projectile points
1 Category 8
3073- 2,

Projectile point fragments
1 Distal
3073- 0,

Indeterminate mammal
Elements Fragments
1 Other

Indeterminate large mammal
Elements Fragments
17 Other

Homo sapiens
Elements Fragments
5 Other

Odocoileus virginianus
Elements Fragments
2 2 Other

Terrapene carolina
Elements Fragments
1 Other

Rana/Bufo sp.
Elements Fragments
1 Other

Indeterminate fish
Elements Fragments
2 Other

Feature 74 **Feature 74**

Indeterminate large mammal
Elements Fragments
2 Other

Canis familiaris
Elements Fragments
1 Other

Feature 75 **Feature 75**

Indeterminate mammal
Elements Fragments
1 Other

Odocoileus virginianus
Elements Fragments
2 Other

Trionyx spiniferus
Elements Fragments
1 Other

Feature 76 **Feature 76**

Projectile points
1 Category 17
3076- 3,

Miscellaneous
1 Ground stone blank
3076- 2,

Projectile point fragments
1 Proximal
3076- 4,

Indeterminate large mammal
Elements Fragments
28 Other

Homo sapiens
Elements Fragments
9 6 Other

Odocileus virginianus

Elements	Fragments	
	1	Dental
6	2	Other

Procyon lotor

Elements	Fragments	
1		Other

Sylvilagus floridanus

Elements	Fragments	
1		Other

Indeterminate turtle

Elements	Fragments	
	2	Other

Terrapene carolina

Elements	Fragments	
	2	Other

Rana/Bufo sp.

Elements	Fragments	
8		Other

Feature 77

Feature 77

Perforators
- 1 Category 1
  - 3077- 3,

Preforms
- 1 Stage 2
  - 3077- 4,

Projectile points
- 1 Category 20
  - 3077- 6,
- 1 Category 25
  - 3077-25,

Cores
- 1 Subconical
  - 3077- 1,

Projectile point fragments
- 1 Medial
  - 3077- 3,

Indeterminate large mammal

Elements	Fragments	
	7	Cther

<u>Odocileus virginianus</u>

Elements	Fragments	
1		Dental
3	1	Cther

<u>Marmota mcnax</u>

Elements	Fragments	
1		Other

<u>Feature 78</u> <u>Feature 78</u>

Projectile pcints
  2 Categcry 17
    3078- 1, 3078- 2,

Indeterminate large mammal

Elements	Fragments	
	2	Cther

<u>Odocileus virginianus</u>

Elements	Fragments	
	2	Other

<u>Tricnyx spiniferus</u>

Elements	Fragments	
1		Cther

<u>Feature 79</u> <u>Feature 79</u>

Projectile pcints
  1 Category 17
    3079- 3,

Preform/blank/bifacial fragments
  1 Elank fragment
    3079- 1,

Projectile pcint fragments
  1 Distal
    3079- 2,

Indeterminate large mammal

Elements	Fragments	
	11	Other

Odocileus virginianus

Elements	Fragments	
2	2	Cther

Meleagris gallopavc

Elements	Fragments	
1		Other

<u>Feature 81</u> <u>Feature 81</u>

Adzes
1 Chipped stcne
3081- 1,

Spalls
1
3081- 2,

Indeterminate large mammal

Elements	Fragments	
	22	Cther

Odocileus virginiarus

Elements	Fragments	
1		Dental
7	1	Cther

Indeterminate bird

Elements	Fragments	
	2	Cther

Meleagris gallopavc

Elements	Fragments	
1		Other

Terrapene carclina

Elements	Fragments	
8		Cther

Ictalurus punctatus

Elements	Fragments	
1		Other

<u>Feature 82</u> <u>Feature 82</u>

Blanks
1 Stage 3
3082- 2,

Knives
1 Contracted
3082- 1,

Scrapers
1 Bifacial end scraper
3082- 4,

Drills
1 On a finished biface
3082- 0,

Projectile point fragments
1 Medial
3082- 5,

Indeterminate large mammal
Elements Fragments
3 Other

Odocileus virginianus
Elements Fragments
1 Other

Feature 83 **Feature 83**

Indeterminate large mammal
Elements Fragments
3 Other

Feature 84 **Feature 84**

Indeterminate mammal
Elements Fragments
2 Other

Indeterminate large mammal
Elements Fragments
1 Other

Marmota monax
Elements Fragments
1 Other

Feature 85 **Feature 85**

Utilized flakes
1 Bifacial thinning flake
3085- 0,

Feature 86
Feature 86

Indeterminate large mammal

Elements	Fragments	
	1	Other

Odocileus virginianus

Elements	Fragments	
1		Dental
5		Other

Indeterminate turtle

Elements	Fragments	
	1	Other

Terrapene carolina

Elements	Fragments	
	1	Other

Feature 87
Feature 87

Projectile points
1 Category 6
3087- 2,

Preform/blank/bifacial fragments
1 Distal portion
3087- 1,

Indeterminate large mammal

Elements	Fragments	
	6	Other

Odocileus virginianus

Elements	Fragments	
2	1	Other

Terrapene carolina

Elements	Fragments	
1		Other

Feature 88
Feature 88

Indeterminate large mammal

Elements	Fragments	
	2	Other

Odocileus virginianus

Elements	Fragments	
1	1	Other

Feature 89

Odocileus virginianus

Elements	Fragments	
3		Other

Feature 90

Blanks
1 Stage 4
3090- 1,

Perforators
1 Category 1
3090- 0,

Drills
1 Indeterminate
3090- 3,

Utilized flakes
2 Bifacial thinning flake
3090- 0,3090- 4,

Preform/blank/bifacial fragments
1 Indeterminate biface fragment
3090- 5,

Indeterminate large mammal

Elements	Fragments	
	51	Other

Odocileus virginianus

Elements	Fragments	
2		Dental
12	6	Other

Cervus canadensis

Elements	Fragments	
1		Dental

Marmota monax

Elements	Fragments	
1		Other

Indeterminate bird

Elements	Fragments	
	5	Other

Terrapene carolina
Elements Fragments
3 Other

Feature 91

Indeterminate large mammal
Elements Fragments
2 Other

Terrapene carolina
Elements Fragments
1 1 Other

Feature 92

Indeterminate mammal
Elements Fragments
5 Other

Odocoileus virginianus
Elements Fragments
1 Other

Ursus americanus
Elements Fragments
2 Other

Rana/Bufo sp.
Elements Fragments
1 Other

Moxostoma sp.
Elements Fragments
1 Other

Feature 93

Projectile point fragments
1 Distal
3093- 1,

Indeterminate large mammal
Elements Fragments
4 Other

Odocoileus virginianus
Elements Fragments
1 Other

 Feature 94

Blanks
- 1 Stage 2
  - 3094-16,

Preforms
- 2 Stage 1
  - 3094- 6,3094-15,

Drills
- 1 Indeterminate
  - 3094- 8,

Projectile points
- 1 Category 6
  - 3094- 7,
- 1 Category 14
  - 3094-10,
- 1 Category 25
  - 3094- 3,
- 1 Category 26
  - 3094-12,

Cores
- 1 Amorphous
  - 3094- 4,

Utilized flakes
- 1 Bifacial thinning flake
  - 3094- 0,

Preform/blank/bifacial fragments
- 2 Proximal portion
  - 3094- 9,3094-13,

Projectile point fragments
- 1 Distal
  - 3094-14,

Indeterminate mammal

Elements	Fragments	
7		Other

Indeterminate large mammal

Elements	Fragments	
	111	Other

Odocileus virginianus

Elements	Fragments	
4		Dental

35 5 Other

Procyon lotor
Elements Fragments
1 Dental

Indeterminate bird
Elements Fragments
8 Other

Indeterminate large bird
Elements Fragments
3 Other

Meleagris gallopavo
Elements Fragments
1 Other

Indeterminate turtle
Elements Fragments
1 Other

Terrapene carolina
Elements Fragments
2 Other

Trionyx spiniferus
Elements Fragments
1 Other

Feature 95

Feature 95

Miscellaneous
1 Crinoid stem
3095- 5,

Indeterminate large mammal
Elements Fragments
2 Other

Odocileus virginianus
Elements Fragments
1 Dental

Feature 96

Feature 96

Projectile points
1 Category 19
3096- 4,

Preform/blank/bifacial fragments
    1 Blank fragment
        3096- 0,

Projectile point fragments
    1 Distal
        3096- 2,

<u>Feature 98</u>

Feature 98

Spalls
    1
        3098- 1,

Preforms
    1 Stage 2
        3098- 4,

Cores
    1 Amorphous
        3098- 2,

Utilized flakes
    1 Bifacial thinning flake
        3098- 5,

Preform/blank/bifacial fragments
    1 Distal portion
        3098- 3,

Indeterminate mammal

Elements	Fragments	
1		Other

Indeterminate large mammal

Elements	Fragments	
	28	Other

Odocoileus virginianus

Elements	Fragments	
1		Antler
2		Dental
9	12	Other

Bufo sp.

Elements	Fragments	
3		Other

Indeterminate fish

Elements	Fragments	
	2	Other

Catcstcmidae
Elements Fragments
3 Other

<u>Feature 102</u> <u>Feature 102</u>

Blanks
1 Stage 1
3102- 9,

Projectile pcints
1 Category 16
3102- 6,

Cores
2 Amcrphcus
3102- 7, 3102- 8,

Preform/blank/bifacial fragments
1 Indeterminate biface fragment
3102- 0,
1 Medial pcrticn
3102- 5,

Indeterminate large mammal
Elements Fragments
46 Cther

<u>Odocileus virginianus</u>
Elements Fragments
18 Other

<u>Urocycn cinereoargenteus</u>
Elements Fragments
1 Cther

Indeterminate bird
Elements Fragments
8 Other

<u>Meleagris gallcpavc</u>
Elements Fragments
1 Cther

<u>Terrapene carolina</u>
Elements Fragments
7 Other

__Feature 103__ __Feature 103__

Blanks
- 1 Stage 1
  - 3103- 6,
- 1 Stage 2
  - 3103- 5,

Preforms
- 1 Stage 3
  - 3103- 4,

Projectile points
- 1 Category 8
  - 3103- 3,

Miscellaneous
- 1 Ground stone blank
  - 3103- 3,

Preform/blank/bifacial fragments
- 1 Distal portion
  - 3103- 2,

Indeterminate large mammal

Elements	Fragments	
	13	Other

__*Odocoileus virginianus*__

Elements	Fragments	
1		Dental
3	2	Other

__*Mustela vison*__

Elements	Fragments	
1		Dental

__*Procyon lotor*__

Elements	Fragments	
1		Other

__*Meleagris gallopavo*__

Elements	Fragments	
2		Other

__Feature 105__ __Feature 105__

__*Terrapene carolina*__

Elements	Fragments	
1		Other

Feature 106 Feature 106

Indeterminate large mammal
Elements Fragments
3 Other

Feature 107 Feature 107

Blanks
1 Stage 1
3107- 6,

Knives
1 Triangular/rounded base
3107- 4,

Scrapers
1 Unifacial end and side scraper
3107- 5,
1 Unifacial end scraper
3107- 7,

Preforms
1 Stage 1
3107- 2,

Preform/blank/bifacial fragments
1 Proximal portion
3107- 3,

Indeterminate
Elements Fragments
1 Other

Indeterminate mammal
Elements Fragments
10 Other

Indeterminate large mammal
Elements Fragments
9 Other

Odocoileus virginianus
Elements Fragments
2 Other

Indeterminate bird
Elements Fragments
1 Other

Terrapene carolina
Elements Fragments
3 Other

Feature 108

Feature 108

Perforators
1 Category 1
3108- 0,

Preforms
1 Stage 3
3108- 5,

Projectile points
1 Category 13
3108- 6,
2 Category 23
3108- 3,3108- 7,

Projectile point fragments
2 Distal
3108- 2,3108- 8,

Indeterminate large mammal
Elements Fragments
1 Other

Odocoileus virginianus
Elements Fragments
2 2 Other

Procyon lotor
Elements Fragments
1 Other

Meleagris gallopavo
Elements Fragments
1 Other

Feature 109

Feature 109

Blanks
1 Stage 3
3109- 1,

Preform/blank/bifacial fragments
2 Proximal portion
3109- 2,3109- 4,

Projectile pcint fragments
    2 Cistal
        31C9- 3,31C9- 9,

Indeterminate mammal

Elements	Fragments	
	1	Other

Indeterminate large mammal

Elements	Fragments	
	11	Other

<u>Odocileus virginianus</u>

Elements	Fragments	
4	1	Cther

<u>Lepisosteus</u> sp.

Elements	Fragments	
1		Other

<u>Feature 110</u>

<u>Feature 110</u>

Blanks
    1 Stage 3
        3110- 3,

Perforatcrs
    1 Category 1
        311C- 1,

Drills
    1 On a bifacila thinning flake
        3110- 5,
    1 On a ncdular flake
        3110- 4,

Utilized flakes
    1 Eifacial thinning flake
        311C- 2,

Indeterminate large mammal

Elements	Fragments	
	16	Cther

<u>Odocileus virginianus</u>

Elements	Fragments	
4		Cther

Indeterminate bird

Elements	Fragments	
	1	Other

Meleagris gallopavo
Elements Fragments
2 Other

Indeterminate turtle
Elements Fragments
1 Other

Feature 111 **Feature 111**

Indeterminate mammal
Elements Fragments
1 4 Other

Odocoileus virginianus
Elements Fragments
2 3 Other

Terrapene carolina
Elements Fragments
1 Other

Feature 113 **Feature 113**

Preforms
1 Stage 2
3113- 4,
1 Stage 3
3113- 2,

Projectile points
1 Category 5
3113- 1,
1 Category 18
3113- 6,

Indeterminate mammal
Elements Fragments
2 Other

Indeterminate large mammal
Elements Fragments
24 Other

Indeterminate small mammal
Elements Fragments
1 Other

Odocoileus virginianus
Elements Fragments
1 Dental

2 1 Cther

Terrapene carclina

Elements	Fragments	
7	1	Cther

Feature 114

Feature 114

Axes
- 1
  - 3114- 1,

Projectile pcints
- 1 Categcry 0
  - 3114- 5,
- 1 Category 6
  - 3114- 4,
- 1 Category 8
  - 3114- 9,

Hammerstones
- 1
  - 3114- 2,

Utilized flakes
- 1 Eifacial thinninc flake
  - 3114- C,

Preform/blank/bifacial fragments
- 2 Indeterminate biface fragment
  - 3114- 7,3114- 7,
- 1 Proximal pcrticn
  - 3114- C,

Projectile point fragments
- 1 Distal
  - 3114- 8,

Indeterminate

Elements	Fragments	
	1	Cther

Indeterminate large mammal

Elements	Fragments	
	29	Cther

Odocileus virginianus

Elements	Fragments	
1		Dental
4	4	Cther

Marmota monax
Elements Fragments
2 Dental

Indeterminate bird
Elements Fragments
3 Other

Terrapene carolina
Elements Fragments
3 1 Other

Tricnyx spiniferus
Elements Fragments
1 Other

Aplodinotus grunniens
Elements Fragments
1 Other

Feature 115

Feature 115

Preforms
1 Stage 3
3115- 1,

Projectile points
1 Category 3
3115- 2,

Hammerstones
1
3115- 3,

Preform/blank/bifacial fragments
2 Indeterminate biface fragment
3115- C,3115- 0,

Indeterminate mammal
Elements Fragments
4 Other

Odocileus virgirianus
Elements Fragments
2 Other

Indeterminate bird
Elements Fragments
2 Other

Feature 117

Blanks
1 Stage 2
3117- 2,

Spalls
1
3117- 1,

Preforms
1 Stage 2
3117- 6,

Projectile points
1 Category 21
3117- 5,

Projectile point fragments
1 Distal
3117- 4,

Indeterminate large mammal

Elements	Fragments	
	25	Other

Odocoileus virginianus

Elements	Fragments	
2	1	Other

Indeterminate turtle

Elements	Fragments	
	1	Other

Terrapene carolina

Elements	Fragments	
	1	Other

Ictalurus sp.

Elements	Fragments	
1		Other

Feature 118

Feature 118

Notched flakes
1 On a flake
3118- 2,

Preform/blank/bifacial fragments
1 Medial portion
3118- 1,

Projectile point fragments
1 Medial
3118- 3,

Indeterminate large mammal

Elements	Fragments	
	7	Other

Indeterminate small mammal

Elements	Fragments	
1		Other

Indeterminate large bird

Elements	Fragments	
1		Other

Feature 119

Feature 119

Indeterminate large mammal

Elements	Fragments	
	3	Other

Odocileus virginianus

Elements	Fragments	
1		Dental
2		Other

Indeterminate fish

Elements	Fragments	
1		Other

Feature 120

Feature 120

Blanks
1 Stage 2
3120- 1,

Indeterminate mammal

Elements	Fragments	
	1	Other

Indeterminate large mammal

Elements	Fragments	
	5	Other

Indeterminate medium mammal

Elements	Fragments	
1		Other

Cervus canadensis

Elements	Fragments	
1		Antler
1		Other

Feature 121

Preforms
1 Stage 2
3121- 1,

Preform/blank/bifacial fragments
1 Proximal portion
3121- 2,

Indeterminate mammal

Elements	Fragments	
1		Other

Indeterminate large mammal

Elements	Fragments	
1		Other

Indeterminate fish

Elements	Fragments	
	1	Other

Feature 122 Feature 122

Projectile points
1 Category 22
3122- 2,

Preform/blank/bifacial fragments
1 Proximal portion
3122- 1,

Indeterminate large mammal

Elements	Fragments	
	5	Other

Feature 123 Feature 123

Preforms
1 Stage 2
3123- 5,

Projectile points
1 Category 17
3123- 4,
1 Category 30
3123- 6,

Cores
1 Amorphous
3123- 7,

Utilized flakes
1 Bifacial thinning flake
3123- C,

Projectile point fragments
1 Distal
3123- 1,

Indeterminate large mammal

Elements	Fragments	
	5	Other

Odocileus virginianus

Elements	Fragments	
1		Dental

Feature 124

Feature 124

Spalls
1
3124- 1,

Preforms
1 Stage 2
3124- C,
1 Stage 3
3124- 4,

Projectile points
1 Category 13
3124- 3,
1 Category 17
3124- 5,

Preform/blank/bifacial fragments
2 Indeterminate biface fragment
3124- C,3124- 0,
1 Distal portion
3124- 1,

Projectile pcint fragments
2 Distal
3124- 6,3124- 7,

Indeterminate large mammal

Elements	Fragments	
	25	Other

Odocileus virginianus

Elements	Fragments	
1		Dental
4	2	Other

Indeterminate bird

Elements	Fragments	
	7	Cther

Meleagris gallopavc

Elements	Fragments	
1		Other

Terrapene carclina

Elements	Fragments	
3		Other

Tricnyx spiniferus

Elements	Fragments	
1		Cther

Feature 125

Feature 125

Projectile pcint fragments
1 Distal
3125- 1,

Feature 126

Feature 126

Indeterminate large mammal

Elements	Fragments	
	5	Cther

Odocileus virginianus

Elements	Fragments	
1		Other

Terrapene carclina

Elements	Fragments	
1		Cther

Feature 127

Blarks
  1 Stage 3
    3127- 6,

Projectile pcints
  1 Category 8
    3127- 5,
  1 Category 14
    3127- 2,
  1 Category 25
    3127-10,

Cores
  1 Subconical
    3127- 7,

Projectile pcint fragments
  3 Distal
    3127- 3,3127- 4,3127- 9,
  1 Medial
    3127- 8,

Indeterminate large mammal

Elements	Fragments	
	19	Other

Odocileus virginianrs

Elements	Fragments	
2		Dental
6	3	Other

Procycn lotor

Elements	Fragments	
4		Cther

Indeterminate bird

Elements	Fragments	
	5	Other

Meleagris gallorayc

Elements	Fragments	
1		Cther

Terrapene carolina

Elements	Fragments	
2	2	Other

Feature 128 Feature 128

Projectile points
1 Category 8
3128- 2,

Utilized flakes
2 Bifacial thinning flake
3128- 0, 3128- 0,

Preform/blank/bifacial fragments
1 Distal portion
3128- 1,

Indeterminate large mammal

Elements	Fragments	
	20	Other

Odocoileus virginianus

Elements	Fragments	
1		Antler
4	2	Other

Indeterminate bird

Elements	Fragments	
	1	Other

Feature 129 Feature 129

Preforms
1 Stage 2
3129- 2,

Projectile points
1 Category 18
3129- 1,

Utilized flakes
1 Decortication flake
3129- 3,

Preform/blank/bifacial fragments
1 Indeterminate biface fragment
3129- 6,

Indeterminate large mammal

Elements	Fragments	
	20	Other

Indeterminate medium mammal
Elements Fragments
3 Other

Odocileus virginianus
Elements Fragments
1 Antler
1 Dental
4 Other

Sciurus carolinensis
Elements Fragments
1 Other

Indeterminate bird
Elements Fragments
3 Other

Terrapene carolina
Elements Fragments
5 1 Other

Trionyx spiniferus
Elements Fragments
1 Other

Indeterminate amphibian
Elements Fragments
1 Other

Rana catesbeiana
Elements Fragments
3 Other

Feature 130 **Feature 130**

Blanks
1 Stage 2
3130- 2,

Utilized flakes
2 Bifacial thinning flake
3130- 0,3130- 0,

Preform/blank/bifacial fragments
2 Indeterminate biface fragment
3130- 0,3130- 0,

Indeterminate large mammal
Elements Fragments
15 Other

Odocileus virginianus

Elements	Fragments	
1		Dental
3		Cther

Sciurus carolinensis

Elements	Fragments	
1		Dental

Feature 131

Feature 131

Preforms
1 Stage 3
3131- 1,

Preform/blark/bifacial fragments
1 Proximal portion
3131- 2,

Indeterminate large mammal

Elements	Fragments	
	15	Cther

Odocileus virginianus

Elements	Fragments	
1	3	Other

Indeterminate bird

Elements	Fragments	
	1	Cther

Indeterminate turtle

Elements	Fragments	
	1	Other

Feature 132

Feature 132

Blanks
1 Stage 3
3132- C,

Projectile points
1 Category 8
3132- 7,

Miscellanecus
1 Crinoid stem
3132- C,

Utilized flakes
2 Bifacial thinning flake
3132- 0,3132- 0,

Projectile point fragments
3 Distal
3132- 4,3132- 5,3132- 6,

Indeterminate mammal

Elements	Fragments	
	31	Other

Odocoileus virginianus

Elements	Fragments	
	1	Antler
1		Dental
11	2	Other

Procyon lotor

Elements	Fragments	
2		Other

Indeterminate bird

Elements	Fragments	
	1	Other

Terrapene carolina

Elements	Fragments	
3		Other

Trionyx spiniferus

Elements	Fragments	
1		Other

Indeterminate fish

Elements	Fragments	
	2	Other

Feature 149

Feature 149

Scrapers
1 Unifacial end and side scraper
3149- 0,

Preforms
1 Stage 2
3149- 5,

Projectile pcints
2 Category 17
3149- 0,3149- 3,
1 Category 29
3149- 1,

Utilized flakes
1 Bifacial thinning flake
3149- 0,

<u>Burial 1</u> <u>Burial 1</u>

Projectile pcints
1 Categcry 17
4001- 1,

<u>Burial 4</u> <u>Burial 4</u>

Indeterminate large mammal

Elements	Fragments	
	1	Other

Odocileus virginianus

Elements	Fragments	
	2	Cther

Indeterminate bird

Elements	Fragments	
	1	Other

<u>Burial 5</u> <u>Burial 5</u>

Indeterminate large mammal

Elements	Fragments	
	13	Cther

Odocileus virginianus

Elements	Fragments	
2		Dental
1		Cther

Cervus canadensis

Elements	Fragments	
1		Cther

Indeterminate turtle

Elements	Fragments	
	1	Other

Burial 6

Burial 6

Projectile points
1 Category 16
4006- 1,

Burial 10

Burial 10

Blanks
1 Stage 2
4010- 0,

Burial 14

Burial 14

Indeterminate large mammal

Elements	Fragments	
	4	Other

Odocoileus virginianus

Elements	Fragments	
4	1	Other

Burial 15

Burial 15

Preforms
1 Stage 3
4015- 1,

Burial 16

Burial 16

Drills
1 On a finished biface
4016- 0,

Indeterminate large mammal

Elements	Fragments	
	1	Other

Odocoileus virginianus

Elements	Fragments	
1		Dental
	3	Other

Crotalidae

Elements	Fragments	
1		Other

Terrapene carolina

Elements	Fragments	
	1	Other

APPENDIX H:
VERTICAL DISTRIBUTION OF VERTEBRATE AND INVERTEBRATE REMAINS

	Level											
TAXA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**TOTAL**
MAMMALIA-MAMMALS	42	867	855	328	128	99	114	116	90	54	52	2,786*
Homo sapiens, Human	1	31		3	1	1						37
Odocoileus virginianus, Deer	35	773	787	296	118	95	109	106	90	50	40	2,540*
Cervus canadensis, Elk	2	20	22		3		2	3			12	64
Lynx rufus, Bobcat		1										1
Mephitis mephitis, Striped skunk			2									2
Mustela vison, Mink		1										1
Procyon lotor, Raccoon		15	20	9	3	2		4		4		57
Ursus americanus, Black bear	3	5	2	1				1				12
Urocyon cinereoargenteus, Gray fox		1	2	1	1		2	1				8
Canis familiaris, Dog		3	3	5								11
Canis lupus, Gray wolf		1										1
Canis spp., Dog species			4									4
Erethizon dorsatum, Porcupine			2	1								3
Castor canadensis, Beaver		1	2		2	1						6
Sciurus carolinensis, Gray squirrel		3	2	5								10
Marmota monax, Woodchuck	1	10	5	2			1	1				20
Tamias striatus, Chipmunk			1									1
Sylvilagus floridanus, Rabbit		2	1	4								7
Didelphis marsupialis, Opossum				1								1
AVES-BIRDS	2	35	75	14	1	4	2	2	4	2	1	142
Corvus corax, Raven				1								1
Strix varia, Barred owl				1								1
Meleagris gallopavo, Turkey		33	75	12	1	4	2	2	4	2	1	136
Buteo jamaicensis, Red-tailed hawk	1											1
Accipiter cooperi, Cooper's hawk		2										2
Anas spp., Duck species	1											1
REPTILIA-REPTILES	2	201	121	80	10	8	15	18	16	13	5	489
Crotalidae, Venomous snake			2	3	2							7
Colubridae, Non-venomous snake			4	4					1			9

	Level											
TAXA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**TOTAL**
Chelydra serpentina, Snapping turtle		1										1
Chrysemys cf. *scripta*, Red-eared slider		2										2
Chrysemys/Graptemys spp., Painted/Map turtle		1	27									28
Terrapene Carolina, Box turtle	1	181	72	66	6	7	15	15	14	11	5	393
Trionyx spiniferus, Softshell turtle	1	16	16	7	2	1		3	1	2		49
AMPHIBIA-AMPHIBIANS		24	1	2								27
Rana catesbeiana, Bullfrog		4	1	1								6
Rana/ Bufo spp., Frog/toad		20		1								21
PISCES-FISHES		12	18	4	1	1	6	2				44
Aplodinotus grunniens, Drumfish		2	6	1			2					11
Ictalurus punctatus, Channel catfish		1	9	1			1	2				14
Ictaluridae sp., Catfish		1		1								2
Moxostoma cf. *caranatum,* River redhorse		1		1								2
Moxostoma spp., Redhorse species		3	3		1	1	3					11
Catostomidae, Sucker		3										3
Lepisosteidae spp., Garfish		1	1									1
TOTAL INDENTIFIED	46	1139	1070	428	140	112	137	138	110	69	58	3,488*
INDETERMINATE	86	1910	2114	1628	213	165	203	231	283	166	113	7,112
Large mammal fragments	77	1742	1913	1422	200	145	187	204	276	159	111	6,436
Medium mammal fragments	6	6		11								23
Small mammal fragments		2	8	5	1	5		1				22
Bird fragments	2	105	117	71	6	4	11	3	6	6	2	333
Reptile Fragments		41	55	103	2	2		20		1		224
Amphibian fragments		1		1								2
Fish fragments	1	13	21	15	4	9	5	3	1			72
TOTAL EXAMINED	132	3049	3184	2056	353	277	340	369	393	235	171	10,600*
MOLLUSCA-FRESHWATER MUSSELS		2096	3723	6241	1173	1805	1392	178	-	-	-	16,608
Amblema plicata, Threeridge		11	48	49	6	10	8	3				135
Cyclonaias tuberculata, Purple wartyback		80	133	218	43	76	44	13				607
Elliptio dilatata, Spike		298	508	1232	129	274	223	16				2680
Plethobasus cicatricosus, White wartyback		1										1
Plethobasus cyphus, Sheepnose		4	11	6	5	12	13					51
Pleurobema clava, Clubshell		60	167	144	21	17	27	1				437
Pleurobema cordatum, Ohio pigtoe		122	191	329	62	136	89	12				941
Pleurobema cordatum pgramidatum		247	405	769	180	223	160	19				2003
Pleurobema spp.		40	11	66	43		11					171
Quadrula cylindrical, Rabbitsfoot		1	10	14	4	2	4	1				36
Quadrula metanevra, Monkeyface		2	1	13	6	8		1				31
Quadrula cf. nodulata, Wartyback				1								1

	Level											
TAXA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**TOTAL**
Quadrula pustulosa, Pimpleback		20	54	108	27	11	28	3				251
Tritogonia verrucosa, Pistolgrip				16	3	2	7					28
Lasmigona costata, Flutedshell		1		1	1							4
Actinonaias ligamentina carinata, Mucker		328	848	843	155	316	228	34				2752
Cyprogenia irrorata, Fanshell		6	15	44	14	23	10	1				113
Dromus dromas, Dromedary Pearlymussel		437	596	996	199	365	236	28				2857
Epioblasma arcaeformis		120	195	364	61	68	58	2				868
Epioblasma brevidens		39	40	78	14	8	20	5				204
Epioblasma flexuosa		30	49	142	29	43	18	1				312
Epioblasma haysiana, Acorn		1	3	10		3	14					31
Epioblasma propinqua/sulcata		131	225	444	67	95	64	6				1032
Epioblasma cincinnatiensis		1	2	9			1					13
Epioblasma triquetra, Snuffbox		1	1	3								5
Lampsilis ovata, Pocketbook		2	14	33	10	14	16	6				95
Ligumia recta, Black sandshell		4	10	33	1	12	5	2				67
Obliquaria reflexa, Threehorn wartyback				3		1		1				4
Obovaria retusa, Ring Pink		8	46	49	29	14	14	3				163
Obovaria subrotunda		8	18	13	9	13	30	4				95
Ellipsaria lineolata, Butterfly			2	12		3						17
Ptychobranchus fasciolaris, Kidneyshell		93	120	196	55	56	61	13				594
Truncilla truncata, Deertoe				3			3					6
Villosa cf. taeniata								3				3
GRAND TOTAL	**132**	**5145**	**6907**	**8297**	**1526**	**2082**	**1732**	**547**	**393**	**235**	**171**	**27,208***

* Includes 41 pieces of Miscellaneous deer bone.

APPENDIX I:
MINIMUM NUMBER OF INDIVIDUALS OF IDENTIFIED SPECIES FOR VERTEBRATE AND INVERTEBRATE REMAINS

	LEVEL											
TAXA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**TOTAL**
MAMMALIA	5	29	33	17	8	5	9	8	3	6	2	125
Odocoileus virginianus, Deer	2	13	16	6	3	2	6	3	3	4	1	59
Cervus canadensis, Elk	1	1	1		1		1	1			1	7
Lynx rufus, Bobcat		1										1
Mephitis mephitis, Striped skunk			2									2
Mustela vison, Mink		1										1
Procyon lotor, Raccoon		3	4	3	2	2		1		2		17
Ursus americanus, Black bear	1	1	1	1				1				5
Urocyon cinereoargenteus, Gray fox		1	2	1	1		1	1				7
Canis familiaris, Dog		1	1	1								3
Canis lupus, Gray wolf		1										1
Canis spp., Dog species												
Erethizon dorsatum, Porcupine			1	1								2
Castor canadensis, Beaver		1	1		1	1						4
Sciurus carolinensis, Gray squirrel		1	1	1								3
Marmota monax, Woodchuck	1	3	1	1			1	1				8
Tamias striatus, Chipmunk			1									1
Sylvilagus floridanus, Rabbit		1	1	1								3
Didelphis marsupialis, Opossum				1								1
AVES-BIRDS	2	3	4	4	1	1	1	1	1	1	1	20
Corvus corax, Raven				1								1
Strix varia, Barred owl				1								1
Meleagris gallopavo, Turkey		2	4	2	1	1	1	1	1	1	1	15
Buteo jamaicensis, Red-tailed hawk	1											1
Accipiter cooperi, Cooper's hawk		1										1
Anas spp., Duck species	1											1
REPTILIA-REPTILES	2	6	7	5	3	2	1	3	3	2	1	35
Crotalidae, Poisonous snake family			1	1	1							3
Colubridae, Non-poisonous snake family			1	1					1			3
Chelydra serpentina, Snapping turtle		1										1

LEVEL	1	2	3	4	5	6	7	8	9	10	11	TOTAL
TAXA												
Chrysemys cf. scripta, Red-eared slider		1	1									2
Terrapene Carolina, Box turtle	1	3	2	2	1	1	1	2	1	1	1	16
Trionyx spiniferus, Softshell turtle	1	1	2	1	1	1		1	1	1		10
AMPHIBIA-AMPHIBIANS		1	1	1								3
Rana catesbeiana, Bullfrog		1	1	1								3
PISCES-FISHES		5	4	3	1	1	3	1				18
Aplodinotus grunniens, Drumfish		1	2	1			1					5
Ictalurus punctatus, Channel catfish		1	1	1			1	1				5
Moxostoma cf. caranatum, River redhorse		1		1								2
Moxostoma spp., Redhorse species		1	1		1	1	1					5
Lepisosteidae spp., Garfish family		1										1
MOLLUSCA		1116	2051	3360	661	987	769	118				9062
Amblema plicata, Threeridge		6L	28R	26L	3L	7L	5R	3L				78
Cyclonaias tuberculata, Purple wartyback		44R	75L	114R	22R	47R	23R	9L				334
Elliptio dilatata, Spike		152L	275L	62IL	82R	159L	127R	9R				1425
Plethobasus cicatricosus, White wartyback		1R										1
Plethobasus cyphus, Sheepnose		3R	7R	4L	4L	8R	7R					33
Pleurobema clava, Clubshell		30L	84L	77L	12R	10R	16L	1L				230
Pleurobema cordatum, Ohio pigtoe		65R	100R	170R	36L	80L	48L	7R				506
Pleurobema cordatum pgramidatum		126R	221R	405L	91R	114R	85R	11L				1053
Pleurobema spp.		21L	8R	46R	25R		8R					108
Quadrula cylindrical, Rabbitsfoot		1L	8R	8L	3L	2L	2L	1R				25
Quadrula metanevra, Monkeyface		1L	1R	7R	4L	6L		1R				20
Quadrula cf. nodulata, Wartyback				1L								1
Quadrula pustulosa, Pimpleback		15L	31L	56L	14L	6R	19R	2R				143
Tritogonia verrucosa, Pistolgrip		1L		12L	2R	1L	4L					20
Lasmigona costata, Flutedshell		1R		1L	1L			1L				4
Actinonaias ligamentina carinata, Mucker		173L	443L	454L	86L	166L	120L	23L				1465
Cyprogenia irrorata, Fanshell		5R	10R	22L	8R	12L	6R	1L				64
Dromus dromas, Dromedary Pearlymussel		223L	304R	535R	103L	183L	123R	15L				1486
Epioblasma arcaeformis		62R	108R	184R	34R	36L	34R	2R				460
Epioblasma brevidens		21L	23L	42L	8R	5R	11R	3R				113
Epioblasma flexuosa		19L	28L	73L	18r	23L	10L	1L				172
Epioblasma haysiana, Acorn		1R	2L	5R		2L	10R					20
Epioblasma propinqua/sulcata		80L	177R	233R	39R	57R	36R	5L				627
Epioblasma cincinnatiensis		1R	2L	6L			1R					10
Epioblasma triquetra, Snuffbox		1R	1L	2R								4
Lampsilis ovata, Pocketbook		2R	10R	22R	5L	8R	10L	6R				63
Ligumia recta, Black sandshell		4R	7L	19L	1L	7L	3R	1L				42

TAXA / LEVEL	1	2	3	4	5	6	7	8	9	10	11	TOTAL
Obliquaria reflexa, Threehorn wartyback				2R		1R						3
Obovaria retusa, Ring Pink		5L	24L	31R	17L	8R	7L	2R				94
Obovaria subrotunda		4L	10R	7R	6R	8R	16R	2L				53
Ellipsaria lineolata, Butterfly			2R	6R								10
Ptychobranchus fasciolaris, Kidneyshell		48L	62L	166L	37L	29L	36L	9L				387
Truncilla truncata, Deertoe				3R			2L					5
Villosa cf. taeniata								3L				3

L = Left R = right

APPENDIX J:
NUMBER OF PIECES, MNI, MEAT YIELDS, AND DIETARY RATIOS BY SPECIES AND LEVEL

Number of Pieces, MNI, Meat Yields, and Dietary Ratios by Species

TAXA	NO. OF PIECES	MNI	MEAT YIELD (kg)	% PHYLUM	TOTAL % CLASS/PHYLUM
MAMMALIA-MAMMALS	2786	122	3591.5		93.3
Homo sapiens, Human	37	-	-	-	-
Odocoileus virginianus, Deer	2540	58	1973.1	54.9	51.3
Cervus Canadensis, Elk	64	7	945.0	26.3	24.55
Lynx rufus, Bobcat	1	1	4.5	0.1	0.1
Mephitis mephitis, Striped skunk	2	2	6.4	0.2	0.2
Mustela vison, Mink	1	1	0.6	T	T
Procyon lotor, Raccoon	57	17	127.2	3.5	3.3
Ursus americanus, Black bear	12	4	428.8	11.9	11.1
Urocyon cinereoargenteus, Gray fox	8	7	16.1	0.4	0.4
Canis familiaris, Domestic dog	11	3	-	-	-
Canis lupus, Gray wolf	1	1	-	?	?
Canis spp., Dog supp.	4	-	-	-	-
Erethizon dorsatum, Porcupine	3	2	12.0	0.3	0.3
Castor canadensis, Beaver	6	4	57.2	1.6	1.5
Sciurus carolinensis, Gray squirrel	10	3	1.2	T	T
Marmota monax, Woodchuck	20	7	14.7	0.4	0.4
Tamias striatus, Chipmunk	1	1	-	-	-
Sylvilagus floridanus, Rabbit	7	3	1.8	T	T
Didelphis marsupialis, Opossum	1	1	2.9	0.1	0.1
AVES-BIRDS	142	20	89.7		2.3
Corvus corax, Raven	1	1	1.9	2.1	T
Strix varia, Barred owl	1	1	-	?	?
Meleagris gallopavo, Turkey	136	15	87.0	97.0	2.3
Buteo jamaicensis, Red-tailed hawk	1	1	-	?	?
Accipiter cooperi, Cooper's hawk	2	1	-	?	?
Anas spp., Duck spp.	1	1	0.8	0.9	T
RETILIA-REPTILES	489	33	12.1		0.3
Crotalidae, Poisonous snake family	7	3	?	?	?
Colubridae, Non-poisonouse snake family	9	3	?	?	?

TAXA	NO. OF PIECES	MNI	MEAT YIELD (Kgs)	% CLASS/PHYLUM	TOTAL % CLASS/PHYLUM
Chelydra serpentina, Snapping turtle	1	1	2.3	19.0	0.1
Chrysemys cf. *scripta*, Red-eared slider	2	2	0.2	1.7	T
Crysemys/Graptemys spp., Painted/Map turtle	28	-	-	-	-
Terrapene Carolina, Box turtle	393	15	1.5	12.4	T
Trionyx spinifergus, Softshell turtle	49	9	8.1	66.9	0.2
AMPHIBIA-AMPHIBIANS	27	3	0.3	-	T
Rana catesbeiana, Bullfrog	6	3	0.3	-	T
Rana/Bufo spp., Frog/toad spp.	21	-	-	-	T
PISCES-FISHES	44	18	21.7		0.6
Aplodinatus grunniens, Drumfish	11	6	10.9	50.2	0.3
Ictaliurus punctatus, Channel catfish	14	5	4.5	20.7	0.1
Ictaluridae, Catfish family	2	-	-	-	-
Moxostoma cf. carinatum, River redhorse	2	1	0.9	4.1	T
Moxostoma spp., Redhorse spp.	11	5	4.5	20.7	0.1
Catostomidae, Sucker family	3	-	-	-	-
Lepisosteidae spp., Garfish spp.	1	1	0.9	4.1	T
SUBTOTALS	**3488**	**196**	**3715.3**		**96.5**
MOLLUSCA-FRESHWATER MUSSELS	16608	9062	134.54		3.5
Amblema plicata, Threeridge	135	78	1.20	0.89	T
Cyclonaias tuberculata, Purple wartyback	607	334	5.40	4.01	0.1
Elliptio dilatata, Spike	2680	1425	13.10	9.74	0.3
Plethobasus cicatricosus, White-warty back	1	1	0.02	0.01	T
Plethobasus cyphus, Sheepnose	51	33	0.60	0.45	T
Pleurobema clava, Clubshell	437	230	1.60	1.19	T
Pleurobema cordatum	941	506	7.90	5.87	0.2
Pleurobema cordatum pyramidatum	2003	1053	16.50	12.26	0.4
Pleurobema spp.	171	108	1.70	1.26	T
Quadrula cylindrical, Rabbitsfoot	36	25	0.30	0.22	T
Quadrula metamevra. Monkeyface	31	20	1.70	1.26	T
Quadrula cf. *nodulata*, Wartyback	1	1	0.01	0.01	T
Quadrula pustulosa, Pimpleback	251	143	1.50	1.11	T
Tritogonia verrucosa, Pistolgrip	28	20	1.60	1.19	T
Lasmigona costata, Flutedshell	4	4	0.10	0.07	T
Actinonaias ligamentina carinata, Mucker	2752	1465	43.20	32.11	1.1
Cyprogenia irrorata, Fanshell	113	64	0.40	0.30	T
Dromus dromas, Dromedary Pearlymussel	2857	1486	14.10	10.48	0.3
Epioblasma arcaeformis	868	460	3.60	2.68	0.1
Epioblasma brevidens	204	113	1.00	0.74	T
Epioblasma flexuosa	312	172	1.50	1.11	T
Epioblasma haysiana, Acorn	31	20	0.20	0.15	T
Epioblasma propinqua/sulcata	1032	627	5.00	3.72	0.1

TAXA	NO. OF PIECES	MNI	MEAT YIELD (Kgs)	% CLASS/PHYLUM	TOTAL % CLASS/PHYLUM
Epioblasma cincinnatiensis	13	10	0.10	0.07	T
Epioblasma triquetra, Snuffbox	5	4	0.03	0.02	T
Lampsilis ovata, Pocketbox	95	63	3.30	2.45	T
Ligumia recta, Black sandshell	67	42	0.80	0.59	T
Obliquaria reflexa, Three-horned wartyback	4	3	0.20	0.15	T
Obovaria retusa, Ring Pink	163	94	1.00	0.74	T
Obovaria subrotunda	95	53	0.40	0.30	T
Ellipsaria lineolata, Butterfly	17	10	0.10	0.07	T
Ptychobranchus fasciolaris, Kidneyshell	594	387	6.330	4.70	0.1
Truncilla truncata, Deertoe	6	5	0.03	0.02	T
Villosa cf. *taeniata*	3	3	0.02	0.01	T
GRAND TOTAL	20096	9258	3849.81	-	100.0

MNI=minimum number of individuals

T= Trace contribution

= value corrected from original report edition

Number of Pieces, MNI, Meat Yields, and Dietary Ratios by Level

	Level Number																			
	1&2		3		4		5		6		7		8		9		10		11	
Resource	MY*	%	MY	%	MY	%	MY	%	MY	%	MY	%	MY	%	MY	%	MY	%	MY	%
Deer	476.3	50.5	544.3	59.6	204.0	49.3	102.0	35.7	68.0	57.0	204.0	56.0	102.0	28.5	102.0	93.8	136.0	95.2	34.0	19.4
Elk	270.0	28.6	135.0	14.8	--	--	135.0	47.2	--	--	135.0	37.1	135.0	37.7	--	--	--	--	135.0	77.2
Bear	107.2	11.4	107.2	11.7	107.2	25.9	--	--	--	--	--	--	107.2	29.9	--	--	--	--	--	--
Other mammal	51.5	5.5	64.4	7.1	36.8	8.9	31.6	11.0	29.3	24.6	4.4	1.2	4.4	1.2	--	--	--	--	--	--
MAMMALS (TOTAL)	905.0	90.5	850.9	93.2	348.0	84.0	268.6	93.9	97.3	81.6	343.4	94.3	348.6	97.3	102.0	93.8	136.0	95.2	169.0	96.6
Bird	12.4	1.3	23.2	2.5	13.5	3.3	5.8	2.0	5.8	4.9	5.8	1.6	5.8	1.6	5.8	5.3	5.8	4.1	5.8	3.3
Reptile	3.6	0.3	2.1	0.2	1.1	0.3	1.0	0.3	0.3	0.3	0.1	T	1.1	0.3	1.0	0.9	1.0	0.7	0.1	T
Amphibian	T	T	T	T	T	T	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fish	6.3	0.7	0.6	0.6	3.6	0.9	0.9	0.3	0.9	0.8	3.6	1.0	0.9	0.3	--	--	--	--	--	--
Mussel	15.3	1.6	3.4	3.4	47.9	11.6	9.8	3.4	14.2	11.9	11.1	3.0	1.8	0.5	--	--	--	--	--	--
GRAND TOTAL	942.6	99.9	880.2	99.9	414.1	100	286.1	99.9	119.2	95.5	364.0	99.9	358.2	100.0	108.8	100	142.8	100.0	174.9	99.9

* Meat yield in kilograms

T Trace contribution of meat

= value corrected from original report edition

APPENDIX K:
METRIC ATTRIBUTES FOR LITHIC IMPLEMENTS BY CATEGORY

Blanks

	Length	Width	Thickness
Blank Stage 1 (*n*=34)			
Range	55.0–154.0 mm	37.0–80.5 mm	17.00–60.0 mm
Mean	85.1 mm	51.5 mm	28.2 mm
SD	20.43 mm	9.62 mm	8.90 mm
Blank Stage 2 (*n*=49)			
Range:	53.5–179.5 mm	32.0–74.5 mm	12.5–40.0 mm
Mean:	76.1 mm	46.6 mm	21.3 mm
SD:	19.25 mm (38)	8.90 mm (49)	5.64 mm (49)
Blank Stage 3 (*n*=39)			
Range:	45.0–96.5 mm	21.5–80.0 mm	7.5–36.0 mm
Mean:	69.6 mm	42.2 mm	20.5 mm
SD:	13.99 mm (23)	10.62 mm (38)	5.86 mm (39)
Blank Stage 4 (*n*=17)			
Range:	59.0–97.0 mm	30.5–55.0 mm	13.0–30.5 mm
Mean:	80.8 mm	42.6 mm	20.3 mm
SD:	12.51 mm (12)	6.44 mm (16)	4.28 mm (17)
Blank Stage 5 (*n*=3)			
Range:	54.0–67.0 mm	28.5–31.0 mm	11.5–17.0 mm
Mean:	60.5 mm	30.2 mm	14.3 mm
SD:	9.19 mm (2)	1.44 mm (3)	2.75 mm (3)

Preforms

	Length	Width	Thickness
Preform Stage 1 (*n*=41)			
Range:	48.0–94.0 mm	30.0–50.0 mm	95.5–21.0 mm
Mean:	71.9 mm	40.3 mm	15.6 mm
SD:	13.59 mm (14)	4.49 mm (39)	2.89 mm (41)
Preform Stage 2 (*n*=64)			
Range:	50.5–83.0 mm	17.0–44.0 mm	8.5 -22.0 mm
Mean:	66.8 mm	34.5 mm	13.0 mm
SD:	9.42 mm (16)	5.25 mm (64)	2.76 mm (64)
Preform Stage 3 (*n*=93)			
Range:	40.5–121.5 mm	16.0–45.0 mm	5.5–18.5 mm
Mean:	57.4 mm	28.9 mm	10.1 mm
SD:	14.10 mm (30)	5.35 mm (91)	2.22 mm (93)

Projectile Points/Knives

Category 1: Auriculate Base

(n=1)

	Blade Length	Width	Thickness
Mean:	--	--	--
	Haft Length	Width	Thickness

Mean:	9.5 mm	25.0 mm	4.0 mm
	Base Depth		
	4.5 mm		

Category 2: Corner Notched, Prominent Barbs, Expanded Base(*n*=1)

	Blade Length	Width	Thickness
Mean:	--	31.0 mm	6.5 mm
	Stem Length	Width	Thickness
Mean:	8.5 mm	--	2.5 mm
		Neck Width	
		17.5 mm	

Category 3: Deep Side Notched, Rectangular Stem(*n*=17)

	Blade Length	Width	Thickness
Range:	28.0–67.0 mm	18.5–27.0 mm	5.5–9.5 mm
Mean:	47.5 mm	24.0 mm	7.8 mm
SD:	11.88 mm (11)	2.43 mm (14)	1.27 mm (14)
	Stem Length	Width	Thickness
Range:	8.0–14.0 mm	19.5–28.0 mm	3.0–5.5 mm
Mean:	10.9 mm	23.3 mm	4.5 mm
SD:	1.84 mm (17)	2.43 mm (16)	0.72 mm (17)
		Neck Width	
Range:		13.0–21.0 mm	
Mean:		17.4 mm	
SD:		2.37 mm (17)	

Category 4: Side Notched, Expanded Stem, Tapered Shoulders(*n*=12)

	Blade Length	Width	Thickness
Range:	38.0–63.5 mm	20.0–30.0 mm	6.0–10.0 mm
Mean:	47.9 mm	24.0 mm	7.9 mm
SD:	8.24 mm (9)	2.80 mm	7.9 mm
	Stem Length	Width	Thickness
Range:	7.5–14.0 mm	18.5–27.5 mm	3.0–6.0 mm
Mean:	10.7 mm	22.6 mm	4.1 mm
SD:	2.10 mm (12)	2.76 mm (9)	1.00 mm (12)
		Neck Width	
Range:		14.0–19.0 mm	
Mean:		17.1 mm	
SD:		1.82 mm (11)	

Category 5: Wide Expanded Stem, Side Notched(*n*=12)

	Blade Length	Width	Thickness
Range:	38.0–60.0 mm	22.0–29.5 mm	75.-10.0 mm
Mean:	51.4 mm	25.6 mm	9.4 mm
SD:	6.96 mm (9)	2.36 mm (12)	0.67 mm (12)
	Stem Length	Width	Thickness
Range:	9.5–19.5 mm	20.5–27.5 mm	3.5–8.2 mm
Mean:	11.8 mm	24.5 mm	5.8 mm
SD:	2.66 mm (12)	2.66 mm (12)	1.23 mm (12)
		Neck Width	
Range:		16.0–21.5 mm	
Mean:		19.0 mm	
SD:		1.88 m (12)	

Category 6: Side Notched, Short Expanded Stem(*n*=13)

	Blade Length	Width	Thickness
Range:	50.0–80.0 mm	22.5–32.0 mm	75.-11.5 mm
Mean:	57.8 mm	26.9 mm	9.1 mm
SD:	16.35 mm (8)	2.93 mm (12)	1.28 mm (12)
	Stem Length	Width	Thickness
Range:	85.-14.0 mm	21.5–30.5 mm	4.0–5.5 mm
Mean:	11.0 mm	26.9 mm	4.7 mm
SD:	1.69 mm (13)	2.83 mm (11)	0.52 mm (13)
		Neck Width	
Range:		17.0–24.0 mm	
Mean:		21.9 mm	
S.D:		1.83 mm (13)	

Category 7: Undifferentiated Side Notched(*n*=2)

	Blade Length	Width	Thickness
Range:	62.0–62.0 mm	30.0–31.5 mm	8.0–8.0 mm
Mean:	62.0 mm	30.8 mm	8.0 mm
SD:	-- (1)	1.06 mm (2)	0.00 mm (2)
	Stem Length	Width	Thickness
Range:	15.0–17.0 mm	22.0–28.0 mm	5.5–5.5 mm
Mean:	16.0 mm	25.0 mm	5.5 mm
SD:	1.41 mm (2)	4.24 mm (2)	-- (1)
		Neck Width	
Range:		22.0–25.4 mm	
Mean:		23.7 mm	
SD:		2.40 mm (2)	

Category 8: Side Notched, Deeply Incurvate Expanded Stem, Medium-Small Blade(*n*=28)

	Blade Length	Width	Thickness
Range:	34.0–61.5 mm	16.0–29.0 mm	6.5–11.5 mm
Mean:	47.3 mm	2l.9 mm	8.6 mm
SD:	7.13 mm (20)	2.99 mm (27)	l.22 mm (28)
	Stem Length	Width	Thickness
Range:	7.0–15.0 mm	18.0–26.0 mm	3.0–6.0 mm
Mean:	10.7 mm	22.3 mm	4.4 mm
SD:	1.98 mm (28)	2.01 mm (25)	0.72 mm (28)
		Neck Width	
Range:		13.5–20.5 mm	
Mean:		17.4 mm	
SD:		1.62 mm (28)	

Category 9: Shallow Side Notched, Incurvate Expanded Stem, Small Blade(*n*=10)

	Blade Length	Width	Thickness
Range:	29.0–50.0 mm	15.5–20.5 mm	4.5–9.0 mm
Mean:	38.3 mm	17.7 mm	7.8 mm
SD:	6.83 mm (8)	2.02 mm (10)	1.54 mm (9)
	Stem Length	Width	Thickness
Range:	7.0–11.5 mm	17.5–21.0 mm	3.0–5.5 mm
Mean:	9.0 mm	18.6 mm	4.2 mm
SD:	1.52 mm (10)	1.29 mm (8)	0.71 mm (10)
		Neck Width	
Range:		11.5–18.5 mm	
Mean:		15.3 mm	
SD:		1.96 mm (10)	

Category 10: Undifferentiated Corner/Side Notched(*n*=2)

	Blade Length	Width	Thickness
Range:	52.5–55.5 mm	26.0–26.0 mm	7.0–8.5 mm
Mean:	54.0 mm	26.0 mm	7.8 mm
SD:	2.12 mm (2)	0.00 mm (2)	1.06 mm (2)
	Stem Length	Width	Thickness
Range:	11.0–11.5 mm	21.0–21.0 mm	5.0–5.0 mm
Mean:	11.3 mm	21.0 mm	5.0 mm
SD:	0.35 mm (2)	-- (1)	0.00 mm (2)
		Neck Width	
Range:		19.0–20.0 mm	
Mean:		19.5 mm	
SD:		0.71 mm (2)	

Category 11: Corner Removed, Narrow Stem, Notched Base (*n*=5)

	Blade Length	Width	Thickness
Range:	43.0–53.0 mm	23.0–28.0 mm	6.5–8.0 mm
Mean:	48.1 mm	25.5 mm	7.4 mm
SD:	4.33 mm (4)	2.04 mm (4)	0.65 mm (5)
	Stem Length	Width	Thickness
Range:	7.0–8.5 mm	11.5–11.5 mm	2.5–5.0 mm
Mean:	8.1 mm	11.5 mm	4.1 mm
S.D:	0.65 mm (5)	0.00 mm (2)	0.96 mm (5)
		Neck Width	
Range:		12.0–13.5 mm	
Mean:		12.6 mm	
SD:		0.65 mm (5)	

Category 12: Corner Removed, Wide, Long Stem, Incurvate Base (*n*=1)

	Blade Length	Width	Thickness
Mean:	66.5 mm	31.5 mm	7.5 mm
	Stem Length	Width	Thickness
Mean:	15.0 mm	26.0 mm	4.5 mm
		Neck Width	
Mean:		23.5 mm	

Category 13: Short Straight to Weakly Expanded Stem, Asymmetrical Blade (*n*=25)

	Blade Length	Width	Thickness
Range:	48.0–83.0 mm	22.5–34.0 mm	8.0–12.0 mm
Mean:	66.2 mm	27.6 mm	9.5 mm
SD:	9.53 mm (12)	2.70 mm (24)	1.14 mm (25)
	Stem Length	Width	Thickness
Range:	7.0–13.5 mm	12.3–17.5 mm	4.0–7.0 mm
Mean:	9.4 mm	15.2 mm	5.4 mm
S.D:	1.67 mm (24)	1.29 mm	5.4 mm
	Neck Width		
Range:	12.5–18.0 mm		
Mean:	14.9 mm		
SD:	1.41 mm (24)		

Category 14: Short Medium Expanded Stem, Asymmetrical Blade (*n*=22)

	Blade Length	Width	Thickness
Range:	48.3–66.5 mm	25.0–36.5 mm	6.5–12.5 mm
Mean:	58.2 mm	30.2 mm	9.6 mm
SD:	9.42 mm (4)	2.82 mm (22)	1.52 mm (21)
	Stem Length	Width	Thickness
Range:	6.5–13.0 mm	17.0–23.0	3.0–6.0 mm
Mean:	9.1 mm	19.8 mm	4.5 mm
SD:	1.59 mm (2))	1.97 mm (15)	0.69 mm (22)
		Neck Width	
Range:		16.0–21.5 mm	
Mean:		17.9 mm	

Category 15: Corner Removed, Broad Stemmed, Wide Blade (*n*=3)

	Blade Length	Width	Thickness
Range:	--	37.0–32.5 mm	7.5–11.5 mm
Mean:	--	39.8 mm	9.8 mm
SD:	--	3.89 mm (2)	2.08 mm (3)
	Stem Length	Width	Thickness
Range:	10.5–12.0 mm	17.5–24.0 mm	4.0–6.5 mm
Mean:	11.5 mm	20.7 mm	5.3 mm
SD:	0.87 mm (3)	3.25 mm (3)	1.26 mm (3)
		Neck Width	
Range:		17.0–21.0 mm	
Mean:		19.0 mm	
SD:		2.0 mm (3)	

Category 16: Inversely Tapered Shoulders, Short Narrow Weakly Expanded Stem (*n*=8)

	Blade Length	Width	Thickness
Range:	38.5–52.0 mm	22.0–30.5 mm	7.0–11.0 mm
Mean:	44.1 mm	26.0 mm	8.6 mm
SD:	5.68 mm (4)	2.57 mm (8)	1.37 mm (8)
	Stem Length	Width	Thickness
Range:	7.0–10.0 mm	13.0–17.0 mm	3.3–6.3
Mean:	8.5 mm	14.9 mm	5.1 mm
SD:	1.07 mm (8)	1.33 mm (8)	1.04 mm (8)
		Neck Width	
Range:		11.0–14.5 mm	
Mean:		12.9 mm	
S.D:		1.25 mm (8)	

Category 17: Barbed Shoulder, Wide Expanded Deeply Notched Stem, Straight Base (*n*=41)

	Blade Length	Width	Thickness
Range:	39.0–86.5 mm	24.5–36.0 mm	6.0–11.5 mm
Mean:	51.2 mm	28.9 mm	8.3 mm
SD:	10.70 mm (21)	3.04 mm (39)	1.28 mm (40)
	Stem Length	Width	Thickness
Range:	7.5–14.5 mm	12.5–23.0 mm	3.5–6.0 mm
Mean:	10.9 mm	18.8 mm	4.9 mm
SD:	1.48 mm (41)	3.6 mm (38)	0.67 mm (40)
		Neck Width	
Range:		10.0–17.0 mm	
Mean:		13.8 mm	
SD:		1.99 mm (41)	

Category 18: Small Horizontal Shoulder, Wide Expanded Deeply Notched Stem, Incurvate Base (*n*=13)			
	Blade Length	Width	Thickness
Range:	40.0–64.0 mm	19.5–29.5 mm	6.0–11.0 mm
Mean:	50.5 mm	25.7 mm	8.3 mm
SD:	8.64 mm (7)	2.97 mm (11)	1.39 mm (12)
	Stem Length	Width	Thickness
Range:	7.5–13.0 mm	16.0–25.0 mm	3.5–7.0 mm
Mean:	10.1 mm	20.0 mm	4.7 mm
SD:	1.64 mm (13)	2.51 mm (12)	0.95 mm (13)
		Neck Width	
Range:		11.5–19.0 mm	
Mean:		15.8 mm	
SD:		2.13 mm (13)	

Category 19: Tapered Shoulders; Long, Expanded Stem (*n*=7)			
	Blade Length	Width	Thickness
Range:	73.5 mm	19.5–30.0 mm	7.5–10.0 mm
Mean:	73.5 mm	24.6 mm	9.0 mm
SD:	-- (1)	3.32 mm (7)	1.05 mm (6)
	Stem Length	Width	Thickness
Range:	85.-13.5 mm	13.5–22.5 mm	4.0–7.5 mm
Mean:	11.4 mm	16.8 mm	5.8 mm
SD:	1.82 mm (7)	2.93 mm	1.19 mm (7)
		Neck Width	
Range:		11.0–15.0 mm	
Mean:		12.7 mm	
SD:		1.25 mm (7)	

Category 20: Corner Removed, Narrow, Weakly Expanded Stem (*n*=3)			
	Blade Length	Width	Thickness
Range:	57.0–65.0 mm	21.0–29.5 mm	9.5–11.5 mm
Mean:	61.7 mm	24.7 mm	10.7 mm
SD:	4.16 mm (3)	4.37 mm (3)	1.08 mm (3)
	Stem Length	Width	Thickness
Range:	10.0–12.0 mm	12.5–12.5 mm	5.0–7.0 mm
Mean:	10.8 mm	12.5 mm	5.7 mm
SD:	1.04 mm (3)	0.00 mm (2)	1.15 mm (3)
		Neck Width	
Range:		85.-12.0 mm	
Mean:		10.2 mm	
SD:		1.76 mm (3)	

Category 21: Corner Removed, Expanded Stem, Straight Base (*n*=12)			
	Blade Length	Width	Thickness
Range:	51.0–62.0 mm	25.0–33.5 mm	7.5–14.5 mm
Mean:	57.6 mm	28.3 mm	10.0 mm
SD:	5.01 mm (6)	2.43 mm (12)	1.86 mm (12)
	Stem Length	Width	Thickness
Range:	7.0–12.5 mm	15.5–21.5 mm	4.0–6.0 mm
Mean:	9.7 mm	19.7 mm	4.9 mm
SD:	1.60 mm (12)	1.82 mm (11)	0.64 mm (11)
	Neck Width		
Range:	14.0–18.0 mm		
Mean:	16.0 mm		
SD:	1.07 mm (12)		

Category 22: Medium Shallow Notched, Expanded Stem (*n*=13)

	Blade Length	Width	Thickness
Range:	45.0–66.0 mm	18.5–29.5 mm	6.0–10.0 mm
Mean:	53.9 mm	24.3 mm	8.3 mm
SD:	10.59 mm (4)	3.36 mm (10)	1.23 mm (13)
	Stem Length	Width	Thickness
Range:	8.5–14.5 mm	18.5–27.0 mm	3.0–7.0 mm
Mean:	11.0 mm	21.8 mm	5.0 mm
SD:	1.69 mm (13)	2.52 mm (11)	0.98 (13)
	Neck Width		
Range:	8.5–22.0 mm		
Mean:	15.8 mm		
SD:	3.52 mm (13)		

Category 23: Corner Notched, Expanded Stem, Straight-Incurvate Base, Small Blade (*n*=9)

	Blade Length	Width	Thickness
Range:	35.0–49.5 mm	19.0–26.0 mm	5.5–8.5 mm
Mean:	42.8 mm	22.4 mm	7.5 mm
SD:	4.87 mm (8)	2.93 mm (9)	0.94 mm (9)
	Stem Length	Width	Thickness
Range:	75.-10.5 mm	14.0–18.0 mm	4.5–7.0 mm
Mean:	8.8 mm	16.1 mm	5.1 mm
SD:	1.03 mm (9)	1.49 mm (6)	0.77 mm (9)
		Neck Width	
Range:		12.0–15.0 mm	
Mean:		13.4 mm	
SD:		1.07 mm (9)	

Category 24: Small Corner/Side Notched, Expanded Stem, Straight Base (*n*=2)

	Blade Length	Width	Thickness
Range:	50.0 mm	20.0–20.5 mm	6.5–8.0 mm
Mean:	50.0 mm	20.3 mm	7.3 mm
SD:	-- (1)	0.35 mm (2)	1.06 mm (2)
	Stem Length	Width	Thickness
Range:	9,5–9.5 mm	15.5–16.5 mm	2.5–4.0 mm
Mean:	9.5 mm	16.0 mm	3.3 mm
SD:	0.00 mm (2)	0.71 mm (2)	1.06 mm (2)
		Neck Width	
Range:		12.5–14.0 mm	
Mean:		13.3 mm	
SD:		1.06 mm (2)	

Category 25: Corner Notched, Expanded Stem, Excurvate-Straight Base (*n*=10)

	Blade Length	Width	Thickness
Range:	41.5–55.0 mm	23.0–27.0 mm	8.0–10.0 mm
Mean:	48.4 mm	24.9 mm	8.5 mm
SD:	6.12 mm (4)	1.31 mm (7)	0.76 mm (8)
	Stem Length	Width	Thickness
Range:	9.0–12.0 mm	19.0–23.0 mm	4.0–9.0 mm
Mean:	10.6 mm	21.8 mm	5.4 mm
SD:	1.07 mm (10)	1.43 mm (7)	1.62 mm (8)
		Neck Width	
Range:		15.0–16.5 mm	
Mean:		16.0 mm	
SD:		0.61 mm (9)	

Category 26: Corner Removed, Short Expanding Stem, Narrow Elongate Blade (*n*=10)

	Blade Length	Width	Thickness
Range:	41.5–62.5 mm	16.5–22.0 mm	6.5–10.0 mm
Mean:	54.5 mm	18.9 mm	8.3 mm
SD:	8.94 mm (5)	1.89 mm (10)	1.58 mm (8)
	Stem Length	Width	Thickness
Range:	7.5–13.5 mm	14.5–17.5 mm	3.5–6.0 mm
Mean:	10.2 mm	16.3 mm	4.4 mm
SD:	2.07 mm (10)	0.99 mm (7)	0.89 mm (9)
		Neck Width	
Range:		12.0–15.5 mm	
Mean:		14.1 mm	
SD:		1.13 mm (10)	

Category 27: Corner Removed, Straight Stem (*n*=2)

	Blade Length	Width	Thickness
Range:	35.0 mm	21.5–24.0 mm	7.0–7.5 mm
Mean:	35.0 mm	22.8 mm	7.3 mm
SD:	-- (1)	1.77 mm (2)	0.35 mm (2)
	Stem Length	Width	Thickness
Range:	8.0–10.0 mm	17.5–18.0 mm	4.0–4.5 mm
Mean:	9.0 mm	17.8 mm	4.3 mm
SD:	1.41 mm (2)	0.35 mm (2)	0.35 mm (2)
		Neck Width	
Range:		16.0–17.0 mm	
Mean:		16.5 mm	
SD:		0.71 mm (2)	

Category 28: Corner Removed, Straight/Contracted Stem, Elongate Blade (*n*=2)

	Blade Length	Width	Thickness
Range:	82.0–94.0 mm	23.5–27.0 mm	9.0–11.5 mm
Mean:	88.0 mm	25.3 mm	10.3 mm
SD:	8.49 mm (2)	2.47 mm (2)	1.77 mm (2)
	Stem Length	Width	Thickness
Range:	10.0–13.0 mm	17.5–19.5 mm	5.0–5.5 mm
Mean:	11.5 mm	18.5 mm	5.3 mm
SD:	2.12 mm (2)	1.41 mm (2)	0.35 mm (2)
		Neck Width	
Range:		19.0–19.5 mm	
Mean:		19.3 mm	
SD:		0.35 mm (2)	

Category 29: Corner Removed, Rounded Stem, Barbed Shoulders (*n*=5)

	Blade Length	Width	Thickness
Range:	4.60–83.0 mm	28.0–35.0 mm	6.5–9.0 mm
Mean:	60.8 mm	31.0 mm	8.1 mm
SD:	19.56 mm (3)	2.96 mm (4)	1.18 mm (4)
	Stem Length	Width	Thickness
Range:	8.0–12.0 mm	15.0–18.0 mm	4.0–7.0 mm
Mean:	9.6 mm	16.0 mm	5.4 mm
SD:	1.64 mm (5)	1.73 mm (3)	1.25 mm (4)
		Neck Width	
Range:		13.0–18.0 mm	
Mean:		15.9 mm	
SD:		2.13 mm (5)	

Category 30: Corner Removed, Contracted Stem, Round Base (n=1)			
	Blade Length	Width	Thickness
Mean:	--	--	--
	Stem Length	Width	Thickness
Mean:	15.0 mm	20.0 mm	9.5 mm
		Neck Width	
Mean:		20.0 mm	

Category 31: Corner Removed, Expanded Stem, Small Blade (n=1)			
	Blade Length	Width	Thickness
Mean:	46.5 mm	22.0 mm	14.0 mm
	Stem Length	Width	Thickness
Mean:	7.5 mm	15.5 mm	5.0 mm
		Neck Width	
Mean:		14.0 mm	

Category 32: Corner Removed, Wide Expanded Rounded Stem (*n*=1)			
	Blade Length	Width	Thickness
Mean:	51.0 mm	37.5 mm	7.5 mm
	Stem Length	Width	Thickness
Mean:	18.0 mm	23.0 mm	8.0 mm
		Neck Width	
Mean:		17.5 mm	

Knives

Category 1 (*n*=6)			
	Length	Width	Thickness
Range:	63.0–91.5 mm	23.5–40.5 mm	9.0–16.5 mm
Mean:	77.5 mm	30.5 mm	12.3 mm
SD:	13.05 mm (4)	7.04 mm (5)	2.66 mm (6)
	Stem Length	Width	Thickness
Range:	10.0–175. mm	29.0–37.0 mm	5.0–13.5 mm
Mean:	14.5 mm	34.0 mm	8.9 mm
SD:	3.18 mm (5)	4.36 mm (3)	3.71 mm (5)
		Neck Width	
Range:		22.0–31.0 mm	
Mean:		26.5 mm	
SD:		6.36 mm (2)	

Category 2 (*n*=7)			
	Length	Width	Thickness
Range:	53.0–107.0 mm	30.0–47.0 mm	8.0–24.0 mm
Mean:	78.7 mm	36.9 mm	13.1 mm
SD:	20.62 mm (7)	6.66 mm (7)	5.25 mm (7)

Category 3 (*n*=1)			
	Length	Width	Thickness
	62.5 mm	33.5 mm	11.5 mm

Category 4 (*n*=1)			
	Length	Width	Thickness
	74.0 mm (Broken)	33.5 mm	16.0 mm

Category 5 (*n*=1)			
	Length	Width	Thickness
	63.5 mm (Broken)	21.5 mm	7.0 mm

Scrapers

	Length	Width	Thickness
Category 1 (*n*=2)	71.0 mm	26.5 mm	9.5 mm
	81.5 mm	36.0 mm	18.0 mm
Category 2 (*n*=3)			
Range:	41.5–47.0 mm	29.5–42.0 mm	6.0–17.5 mm
Mean:	44.3 mm	35.8 mm	10.8 mm
SD:	2.75 mm (3)	8.84 mm (2)	5.97 mm (3)
Category 3 (*n*=3)			
Range:	37.0–47.5 mm	28.0–39.0 mm	5.5–12.5 mm
Mean:	42.3 mm	32.8 mm	9.3 mm
SD:	7.42 mm (2)	5.62 mm (3)	3.55 mm (3)
Category 4 (n=1)	58.0 mm	35.5 mm	14.0 mm
Category 5 (*n*=4)			
Range:	26.0–42.5 mm	18.5–31.0 mm	9.5–12.5 mm
Mean:	34.0 mm	24.5 mm	10.5 mm
SD:	9.25 mm (4)	5.31 mm (4)	1.35 mm (4)
Category 6 (*n*=1)	52.0 mm	38.5 mm	11.5 mm
Category 7 (*n*=4)	51.0 mm	37.5 mm	7.5 mm

Drills

Stemmed Drill, Category 1 (n=4)			
	Length	Width	Thickness
Range:	44.5–50.0 mm	18.0–34.5 mm	6.5–13.5 mm
Mean:	47.3 mm	27.3 mm	8.9 mm
SD:	3.89 mm (2)	7.19 mm (4)	3.20 mm (4)
	Bit Length		Thickness
Range:	19.0–34.0 mm		5.5–8.5 mm
Mean:	26.5 mm		6.5 mm
SD:	10.61 mm (2)		1.35 mm (4)

Expanded Triangular to Rounded Based Drill, Category 2 (*n*=11)			
	Length	Width	Thickness
Range:	63.5–65.0 mm	19.0–36.0 mm	9.5–19.5 mm
Mean:	64.5 mm	26.4 mm	11.7 mm
SD:	0.87 mm (3)	5.51 mm (10)	1.58 mm (10)
	Bit Length		Thickness
Range:	25.0–36.5 mm		5.0–10.0 mm
Mean:	29. mm		7.3 mm
SD:	4.35 mm (5)		1.85 mm (11)

Rough, Chunky Bifacial Drill, Category 3 (*n*=2)			
	Length	Width	Thickness
Range:	57.5 mm	27.0–37.0 mm	12.0–22.0 mm
Mean:	57.5 mm	32.3 mm	17.0 mm
SD:	-- (1)	6.72 mm (2)	7.07 mm (2)
	Bit Length		Thickness
Range:	39.5 mm		5.5–9.5 mm
Mean:	39.5 mm		7.5 mm
SD:	-- (1)		2.83 mm (2)

Unhafted Bifacial Drill, Category 4 (*n*=5)			
	Length	Width	Thickness
Range:	55.5–69.0 mm	14.5–19.0 mm	8.5–13.0 mm
Mean:	61.8 mm	16.4 mm	11.4 mm
SD:	5.58 mm (4)	1.85 mm (5)	1.75 mm (5)

Flake Drill, Category 5 (*n*=3)			
	Length	Width	Thickness
Range:	39.0–54.0 mm	22.5–33.0 mm	4.5–11.0 mm
Mean:	47.0 mm	27.5 mm	7.3 mm
SD:	7.55 mm (3)	5.27 mm (3)	3.33 mm (3)
	Bit Length		Thickness
Range:	20.0–26.5 m		4.0–8.0 mm
Mean:	23.8 mm		5.8 mm
SD:	3.40 mm (3)		2.02 mm (3)

Modified Nodule Drill, Category 6 (*n*=2)			
	Length	Width	Thickness
Range:	38.5 mm	17.0–26.5 mm	11.0–17.0 mm
Mean:	38.5 mm	21.8 mm	14.0 mm
SD:	-- (1)	6.72 mm (2)	
	Bit Length		Thickness
Range:	17.0 mm		4.5–8.5 mm
Mean:	17.0 mm		6.5 mm
SD:	-- (1)		2.83 mm (2)

Drill Preforms (*n*=3)			
Specimen 1059–5	Length	Width	Thickness
	48.5 mm	36.5 mm	8.0 mm
	Projection Length		Thickness
	18.0 mm		5.5 mm
Specimen 1001–5	Length	Width	Thickness
	56.6 mm	32.5 mm	7.5 mm
	Projection Length		Thickness
	17.5 mm		5.5 mm
Specimen 1078–2	Length	Width	Thickness
	73.5 mm	37.0 mm	21.0 mm
	Projection Length		Thickness
	30.0+ mm (Broken)		7.0 mm

Perforators

Category 1 (*n*=11)			
	Length	Width	Thickness
Range:	20.0–50.0 mm	13.5–30.0 mm	2.5–11.0 mm
Mean:	29.9 mm	21.4 mm	5.6 mm
SD:	8.79 mm (11)	5.08 mm (11)	2.50 mm (11)
			Bit Thickness
Range:			5.0–22.5 mm
Mean:			12.2 mm
SD:			5.46 mm (10)

Category 2 (*n*=3)			
	Length	Width	Thickness
Range:	25.5–33.0 mm	13.0–25.0 mm	2.5–2.5 mm

Mean:	28.5 mm	197. mm	3.8 mm
SD:	3.97 mm (3)	6.11 mm (3)	1.53 mm (3)
			Bit Thickness
Range:			5.5–12.0 mm
Mean:			9.0 mm
SD:			3.28 mm (3)

Denticulate (*n*=1)			
	Length	Width	Thickness
	21.5 mm	185 m	3.5 m

Perforator/Denticulate (*n*=1)			
Projection Length	Length	Width	Thickness
8.0 mm	37.0 mm	23.0 mm	9.0 mm

Perforator/Graver (*n*=1)			
Perforator Length	Length	Width	Thickness
Broken	34.0 mm	29.0 mm	5.5 mm

Drill/Graver (*n*=1)			
Drill Bit Thickness	Length	Width	Thickness
6.0 mm	Broken	20.5 mm	20.5. mm

Chisels

n=4	Length	Width	Thickness
Range:	89.5–104.5 mm	41.0–47.0 mm	17.5–25.0 mm
Mean:	97.3 mm	44.0 mm	21.4 mm
SD:	6.13 mm (4)	2.74 mm (4)	3.47 mm (4)

Adzes

Category 1 (*n*=2)			
	Length	Width	Thickness
Range:	76.0–79.0 mm	46.5–50.0 mm	17.0–27.0 mm
Mean:	77.5 mm	48.3 mm	22.0 mm
SD:	2.12 mm (2)	2.47 mm (2)	7.07 mm (2)

Category 2 (*n*=2)			
	Length	Width	Thickness
Range:	121.0 mm	67.0–78.0 mm	19.5–24.5 mm
Mean:	121.0 mm	72.5 mm	22.0 mm
SD:	-- (1)	7.78 mm (2)	3.54 mm (2)

Chipped Stone Digging Implements

n=7	Length	Width	Thickness
Range:	131.5–197.0 mm	83.0–148.00 mm	8.0–29.0 mm
Mean:	155.6 mm	111.1 mm	18.2 mm
SD:	23.61 mm (7)	14.52 mm (17)	5.60 mm (17)
		Neck Width	Notch Length
Range:		59.5–101.5 mm	18.0–32.5 mm
Mean:		83.8 mm	27.1 mm
SD:		15.49 mm (8)	5.40 mm (6)

Blades

n=45	Length	Width	Thickness
Range:	19.0–51.0 mm	9.0–30.5 mm	2.0–10.0 mm
Mean:	34.3 mm	15.9 mm	4.8 mm
SD:	7.85 mm (45)	4.8 mm (45)	1.99 mm (45)
	Platform Length	Width	Angle
Range:	3.5–16.0 mm	1.0–9.0 mm	55–90°
Mean:	9.13 mm	3.8 mm	76.5°
SD:	3.25 mm (45)	1.81 mm (45)	8.45° (44)

Grooved Axe

n=12	Length	Width	Thickness
Range:	116.5–173.5 mm	94.5–120.0 mm	45.0–64.0 mm
Mean:	145.0 mm	107.6 mm	55.0 mm
SD:	40.31 mm (2)	11.99 mm (6)	7.58 mm (6)
		Neck Width	Groove Width
Range:		73.0–117.5 mm	33.5–38.0 mm
Mean:		89.9 mm	35.1 mm
SD:		18.3 mm (5)	1.59 mm (6)

Abraded Cobble

	Length	Width	
	185.0 mm (Broken)	132.5 mm	

Ground Stone Gorget

Hole Diameter (center)	Hole Diameters (outer perimeters)	Length	Width
6.0 mm	10.0 mm and 11.5 mm	55.0 mm	44.0 mm

Ground Limestone Bead

	Length	Width	Hole Diameters
	19.5 mm	14.5 mm	12.0–12.5 mm

Boatstone

	Length	Width	Thickness
	Broken	38.0 mm	29.0 mm

Tubular Pipe Blank

	Length	Mid-Diameter	Diameter of Ends
	141.0 mm	60.0 mm	36.5 mm and 38.5 mm

Gorget Blanks

	Length	Width	Thickness
Specimen 1	115.0 mm	78.0 mm	12.5 mm
Specimen 2	89.0 mm	54.0	10.5 mm
Specimen 3	74.0 mm	43.0 mm	

APPENDIX L:
BLADE ATTRIBUTES

Category Number	Length (mm)	Width (mm)	Thickness (mm)	Platform Width (mm)	Platform Length (mm)	Platform Angle (deg)	Platform Treatment Edge	Platform Surface	Cross-section	Bulb of Force	Eraillure	Compression Rings	Termination
F-43	28.0	13.0	5.0	2.5	7.5	90	C;R	Flat	1	P	-	+	0
F-54	36.5	16.0	5.0	2.0	8.0	83	R	F;CX	1	P	+	-	0
F-93	50.0	20.0	9.5	7.0	14.5	75	A;R	F	1	M	+	-	0
F-54	32.0	20.0	7.0	9.0	13.5	82	R	F;CX	1	P	-	-	0
F-8	38.0	21.0	6.5	2.0	11.0	89	CX	F;CX	1	P	+	+	0
F-40	51.0	30.5	10.0	5.0	11.0	83	R	F;CX	1	M	-	-	0
F-34	41.0	15.0	4.0	2.5	9.0	73	A;R	F	1	M	+	-	0
F-27	39.0	20.0	6.0	4.0	10.0	80	A;R	F	1	M	+	-	0
F-100/104	38.0	18.0	6.5	6.5	13.5	75	-	F;CX	2	M	+	-	0
F-27	41.5	16.0	4.0	1.0	4.5	85	C;R	C	1	M	+	-	0
F-35	45.5	18.5	6.0	4.0	8.5	70	A;R	F	2	P	+	+	F
F-53	37.5	21.0	4.5	4.0	13.5	80	A:R	F	1	P	+	+	F
F-54	35.0	13.0	3.0	3.5	6.5	75	F	CX	1	M	+	+	F
F-46	29.5	9.0	2.0	1.5	4.5	87	C;R		1	M	+	+P	F
F-6	33.5	20.5	4.0	5.0	11.0	75	R	F;CX	1	W	-	+	F
F-91	32.5	13.0	2.5	3.0	7.5	65	A	F;CX	2	M	+	+	F
F-54	47.0	22.0	6.5	6.0	13.5	60	R	F;CX	1	M	+	+	H
F-35	42.5	15.5	4.5	4.5	10.0	80	A	F	1	M	+	-	H
F-85	29.0	14.0	4.0	1.5	5.0	86	R;A		1	M	+	+	H
F-25	34.0	18.0	8.0	4.5	16.0	56	F;A	F;CX	1	M	+	-	H
F-35	33.5	15.0	3.5	1.5	3.5	80	A;R	-	1	W	+	+	F
F-40	38.0	19.0	4.5	6.0	11.5	74	R	F;CX	2	M	+	-	S

Category Number	Length (mm)	Width (mm)	Thickness (mm)	Platform Width (mm)	Platform Length (mm)	Platform Angle (deg)	Platform Treatment Edge	Platform Surface	Cross-section	Bulb of Force	Eraillure	Compression Rings	Termination
F-94b	43.0	18.0	4.0	1.5	4.5	75	A;R	-	2	W	+	+	F
F-35	35.0	15.0	3.5	2.5	7.5	70	R	CX	1	W	+	+	F
F-123	41.0	13.0	4.5	5.5	10.5	55	A		1	M	+	-	F
F-43	22.5	14.0	3.5	5.0	14.5	77	A;R	Flake rem.	1	M	-	+	0
F-58	29.0	17.0	3.5	2.0	12.0	82	A	“	1	M	+	-	0
F-102	32.0	17.0	5.0	4.5	8.5	70	Broke		1	Bk.	Bk.	Bk.	0
F-128	38.5	13.0	5.5	6.0	10.5	80	F	CX	1	W	-	+	0
F-100/104	35.0	17.0	5.0	5.0	9.0	88	F;R	F	1	M	-	-	0
F-108	28.0	14.5	4.5	2.0	5.0	80	-	F	2	M	+	-	S
F-113	34.0	14.0	6.0	2.5	4.5	70	A;R	F	1	W	+	+	H
F-94	40.5	20.5	7.5	6.5	11.0	60	CX	CX	1	M	+	+	H
F-11	24.0	15.0	3.0	4.5	10.0	80	R	CX	2	M	+	-	H
F-35	33.0	14.0	3.4	3.0	7.5	78	R	F;CX	1	M	-	-	0
F-8	40.0	15.5	8.5	6.0	10.0	-	Cx	CX	1	M	+	-	0
F-27	42.0	20.5	9.0	3.5	12.5	80	A;R	F	1	M	+	+	0
F-16	24.5	14.0	4.0	3.5	13.0	70	R	F	1	M	+	+	H
F-34	32.5	11.5	2.5	2.0	8.0	81	R	F	1	M	+	+	H
F-39	20.5	9.0	2.0	4.0	8.5	85	R	F;C	1	M	+	-	F
F-35	24.0	11.0	3.0	2.5	5.5	82	A;R	F	1	M	+	+	F
F-8	23.0	11.5	4.0	2.0	6.5	65	R	S	1	W	-	+	F
F-73	19.0	9.5	3.0	3.5	7.5	80	R	F	1	M	-	-	0
F-26	26.0	10.0	2.5	2.5	6.0	75	R	F;CX	1	M	-	-	0
F-35	22.5	11.5	2.5	2.5	5.0	80	R	F;CX	1	M	+	-	0

Key: + Present; R Reduction; M Moderate; 0 Outrepassé; S Step
- Absent; CX Cortex; W Weak; F Feather
C Crushed; P Prominent; A Abrasion; H Hinge

APPENDIX M:
DEBITAGE CATEGORIES AND QUANTIFICATION

Feature	Bifacial Thinning Flake <3 cm	Bifacial Thinning Flake > 3cm	Decortication Flake	Flat Flake	Shatter Flake	Core Flake	Modified Nodule	Modified Nodule Frag.
1	44	10	5			2		11
2	81	42	15	1	4	3	12	24
3	34	10	4	2	1	-	2	14
4	33	3	-	-	-	3	19	6
5	54	29	7	-	7	-	12	10
6	503	251	33	14	9	1	39	123
7	37	-	-	-	-	-	11	7
8	164	170	42	8	43	5	-	72
9	2	-	-	-	-	-	-	-
10	1	-	-	-	-	-	-	-
11	59	34	11	-	3	3	3	31
12	3	10	4			2		16
13	1	5	4				3	6
14	99	44	12	4	4	1	24	24
15	7	2	2				1	
16	39	17	18	4	1	5	19	21
17	69	30	15	7		2	14	40
18	96	33	34	6	14	2	-	23
19	13	2	5	-	4	-	3	-
20	39	9	13	3	7	-	-	6
22	-	4					2	
23		2						3
24	11	6	2	2			3	8
25	78	73	28	9	2	2	40	44
26	36	21	2			-	2	10
27	22	18	3				7	16
28	23	19	3				13	9
29		5	3					
30	1							
31	1							2
32	1							4
33		1	2					
34	289	76	37	15	-	1	20	53
35	1393	339	112	70	37	3	43	100
36	37	24	11				4	14
37	11	5	2	-	-	-	-	6
38	16	13	2				4	
39	47	13	14	3		1	7	10
40	70	62	21			2	18	41
42	108	38	32				29	39
43	160	64	45	12		1	25	45
46	12	14	10	2				6
47	1	-	1	-				
49&67	28	7	4					8
51	28	14	2			1	6	7
52	-	-	-	-	-	-	-	3
53	147	114	33	9	-	-	20	61
54	146	74	28	16			32	43

Feature	Bifacial Thinning Flake <3 cm	Bifacial Thinning Flake >3 cm	Decortication Flake	Flat Flake	Shatter Flake	Core Flake	Modified Nodule	Modified Nodule Frag.
55	40	9	6	2			7	9
56	21	9	1					5
57	94	40	22				10	23
58	16	5	-	1	-	-	-	9
59	50	32	6				17	14
60	5	1	-				5	8
61	31	28	4	1			7	6
62	2	1	2					4
63	38	43	8				22	13
64	45	16	11	1			5	17
66	10	2	-					7
68	4	-	1					2
69	-	1	1	-	-	-	-	-
70	7						5	
71	3	6	1				1	2
72	2	2	1				3	1
73	68	13						15
74	5	7	1	1				4
76	40	20	3				7	16
77	28	16	6			1	4	10
78	-	5					4	1
79	2							
81	-	1					1	1
82	1	13					2	4
83	-	2		1			1	
85	4	5	5				7	2
90	130	98	32	-	4	2	16	34
91	5	5				1	4	
92	3					1	1	
93	6	7						10
94	28	60	11		2	2	38	32
95	-	3						1
97	-	4						1
98	22	19	1				1	7
100&104	81	53	16	2	1		37	22
102	37	38	9	4		2	12	16
103	13	5	5		1		5	8
105	1	1						1
106	3	9	3				3	
107	15	15	3	1			10	5
108	21	12	5		3		9	8
109	14	6	2					3
110	17	16	2				3	5
111	32	15	4	3			11	8
113	27	19	2	1				9
114	83	31	8		6	1	23	31
115	19	12	4	6			4	9
116	3	-	1					1
117	-	3	-	-	-	-	-	-
118	22	13	4		3			9
119	-	-	-	-	1	-	3	-
120	4	4						5
121	3	5	1				5	
122	-	2	-	-	-	-	-	-
123	9	3					4	2

Feature	Bifacial Thinning Flake <3 cm	Bifacial Thinning Flake >3 cm	Decortication Flake	Flat Flake	Shatter Flake	Core Flake	Modified Nodule	Modified Nodule Frag.
124	24	29	2				14	7
125	-	1						1
126	1	1	1					
127	51	36	7	2	3	1	29	16
128	9	11	4				5	6
129	15	11	3				8	16
130	25	23	8	2	2	1	24	17
131	5	4	-	1	1		2	3
TOTAL	5,288	2,558	838	216	163	52	815	1,432

Grand Total: 11,342

= value corrected from original report edition