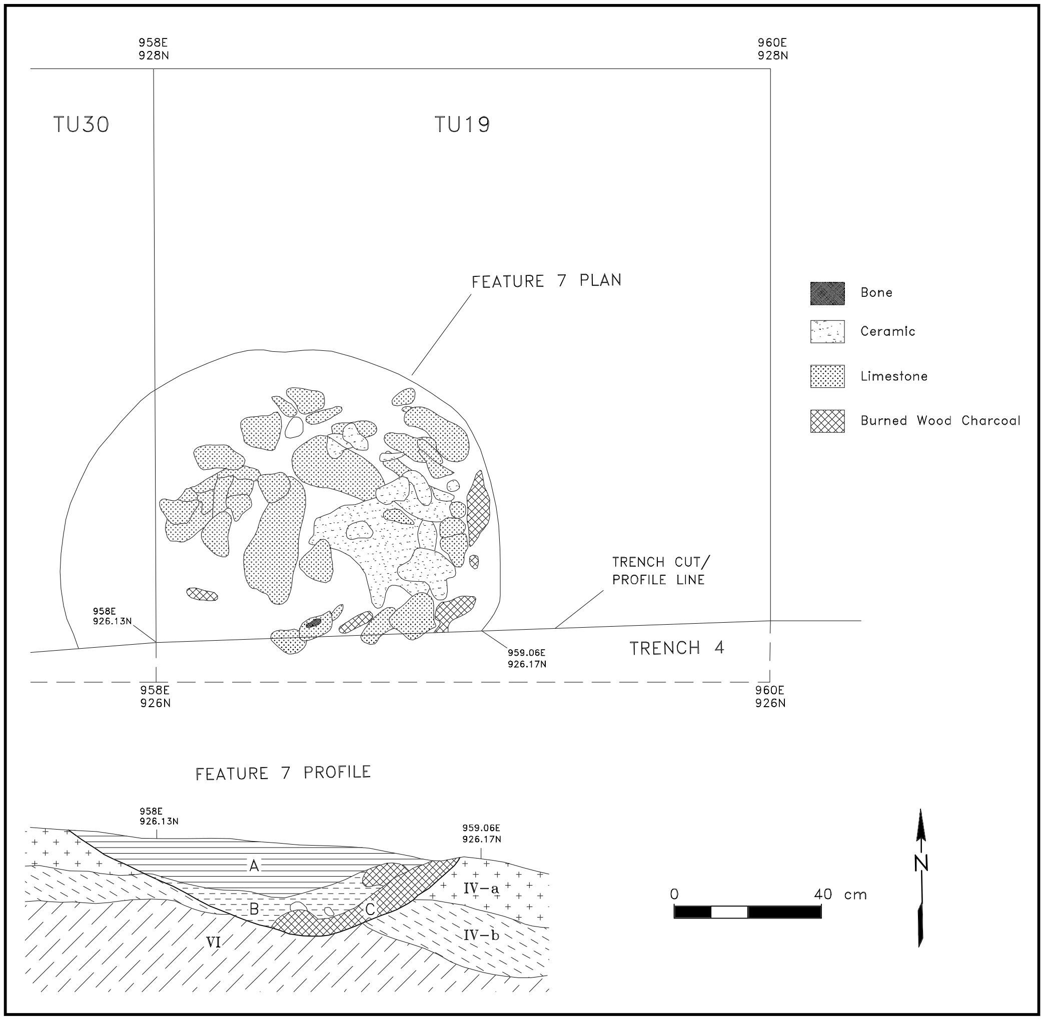
Virginia's Powell Valley during the Late Archaic/Early Woodland and Middle/Late Woodland Transitions

Archaeological Data Recovery at Site 44LE165, Associated with the Route 58 Project, Section E32, Lee County, Virginia

Project: 0058-052-E32, PE101
PPMS: 15613



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Management Summary

The William and Mary Center for Archaeological Research conducted archaeological data recovery at Site 44LE165 in Lee County, Virginia, associated with Section E32 of the Route 58 project. These investigations were conducted from November 17, 1997, to February 15, 1998. This work was conducted in accordance with an agreement with the Virginia Department of Transportation (Project: 0058-052-E32, PE101).

The total site area was approximately 0.91 ha. Gradall stripping revealed an area of intact subplowzone deposits measuring about 13 m in diameter and as much as 0.52 m deep in the southwestern portion of the site; these deposits were the focus of the excavations.

Geomorphological analysis demonstrated that the site occupies portions of two terraces adjacent to and above Cane Creek, with the upper (second) terrace adjacent to an upland toe slope with exposed limestone. Approximately 97 m² was stripped by a Gradall to the top of the Late Archaic/Early Woodland Transitional components. A total of 48 m² was excavated in 26 test units; the excavation of these units, eight cultural features, and four backhoe trenches resulted in the recovery of 20,992 prehistoric artifacts and 23 modern historic artifacts. Prehistoric features include six postmolds and an informal hearth associated with the Late Archaic component, and one pit feature associated with the late Middle Woodland/early Late Woodland component. A radiocarbon sample obtained from one of the Late Archaic postmolds returned a corrected, calibrated, 2 sigma date of 3095–2905 B.C. (Beta-124255). The late Middle Woodland/early Late Woodland pit contained limestone-tempered, Radford-like ceramics, and large amounts of wood charcoal. Archaeobotanical analysis of flotation samples from the pit revealed two complete corn kernels and three cupule fragments, as well as a few hickory and walnut shell fragments. Two radiocarbon dates were obtained from the feature. Wood charcoal from the upper portion of the feature returned a corrected, calibrated 2 sigma date of AD 645–880. Wood charcoal from the lower portion of the feature returned a corrected, calibrated, 2 sigma date of AD 780–1000. This feature provides important, secure dates both for the ceramic materials recovered from the feature, and for the use *Zea mays* (corn) in southwestern Virginia.

The archaeological results identified and described the function and structure of a small special purpose camp occupied beginning in the Late Archaic period and continuing through the transition into the Early Woodland period. Components from the Middle and Late Woodland periods were also identified in plowzone contexts, and artifact assemblages were examined and described from a diachronic perspective as well. Lithic microwear analysis was conducted on a selection of 42 tools to examine site structure, function, and activities.

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1 Introduction

INTRODUCTION

The William and Mary Center for Archaeological Research conducted archaeological data recovery for mitigation of adverse effects to Site 44LE165 in Lee County, Virginia, associated with Section E32 of the Route 58 project (Figure 1). These investigations were conducted from November 17 to November 25, 1997, December 1 to December 15, 1997, January 5 to January 17, 1998, January 21 to February 2, 1998, and February 9 to February 15, 1998. This work was conducted in accordance with an agreement with the Virginia Department of Transportation (Project: 058-052-E32, PE101).

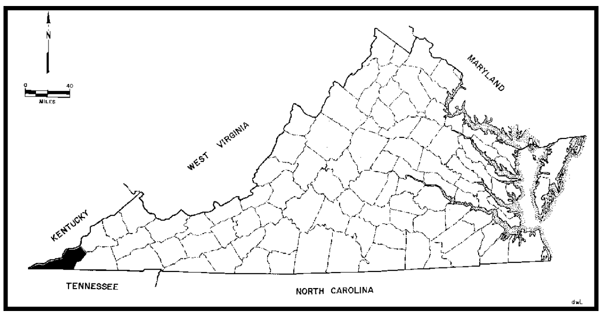


Figure 1. Project area location.

The data recovery was carried out under the general supervision of Dennis B. Blanton. Project Archaeologist Stevan C. Pullins was responsible for the organization and implementation of the field program, and preparation of the final report. Senior Field Archaeologists Ken Stuck and Chip Huston, and Field Assistants Jamie Bauguess, Jerry Blake, Jeanne Douglas, Robert Feldacher, Jeff Hager, Chad Long, Stephen Moore, Rebecca Pryor, Angus Sawyer, John Underwood, and Adrienne Vaughan aided in the execution of the field program. Deborah L. Davenport supervised laboratory processing, and Veronica L. Deitrick conducted the analysis of prehistoric artifacts. Final illustrations for the report were prepared by Eric A. Agin and William H. Moore. All photographs and documentation related to this project are temporarily stored at the WMCAR in Williamsburg, Virginia, referenced under WMCAR project number 97-39.

Site 44LE165 was identified in January 1993 during a cultural resource survey of the proposed right-of-way by the WMCAR (Metz et al. 1993). Following subsequent archaeological evaluation (Peterson and Pullins 1995) and official review of the results, the prehistoric component of the site was determined eligible for the National Register of Historic Places (NRHP). Due to potential impacts of the highway construction and complications associated with redesigning the project to avoid the site, data recovery was recommended for 44LE165.

Site 44LE165 has Late Archaic/Early Woodland Transitional period components, as well as occupations dating to the Middle and Late Woodland periods. The site is located on alluvial bottomland soils adjacent to Cane Creek (a tributary of the North Fork of the Powell River) in a floodplain/terrace environment. Stratigraphy, diagnostic artifacts, and a corrected, calibrated, 2-sigma radiocarbon date of 370 BC to AD 370 (Beta-73167) from the evaluation indicated an intact, buried Early to Middle Woodland component (Peterson and Pullins 1995). Diagnostic artifacts documented site use in the Early Archaic and Late Woodland periods as well. The material culture included debitage, cores, fire-cracked rock, hafted bifaces, unfinished bifaces, scraping tools with variable morphology, a few ceramic sherds, and a small amount of faunal material. High densities of lithic materials were identified in several areas across the site; these activity areas may have resulted from either the gradual accumulation of material over time, or from episodic visits that included activities generating large quantities of lithic debitage. In general terms, the lithic assemblage suggested a focus on early-stage tool production rather than tool use; however, the presence of both bifacial and scraping tools indicated some diversity of activity. Possible features identified during the evaluation include a postmold and a concentration of rock.

Site 44LE165 has potential for addressing research topics relevant to the transitional period at the beginning of the Woodland period, and the changes in the type, function, and organization of settlement prior to the advent of horticulture.

PROJECT AREA DESCRIPTION AND ENVIRONMENTAL CONTEXT

During the identification survey of the Route 58 project and the archaeological evaluation of 44LE165, the project area consisted of: (1) the existing stretch of Alternate Route 58 between Pennington Gap and Dryden to be widened, and (2) two alternative routes through or around each town. The corridors around Pennington Gap involved construction of a new, four-lane roadway that would pass either north or south of the town, designated Corridors A and B, respectively. Both corridors extended through portions of the site west of Pennington Gap, with a total project length of 23.04 km and an average width of 61–69 m. Since that time, Corridor A, which passes north of Pennington Gap, has been chosen as the preferred route. Site 44LE165 is located near the western end of Section E32, west of Pennington Gap, where Corridor A rejoins existing Route 58 near the junction with Route 634 (Figure 2).

The site is situated on a gently sloping terrace with a southern exposure, at an elevation of approximately 427 m above mean sea level (amsl). The site is adjacent to Cane Creek, a tributary of the North Fork of the Powell River; the North Fork lies about 3.3 km northeast of the site, and the Powell River itself is about 3.8 km to the southeast. Site 44LE165 is part of a tributary terrace/floodplain microenvironmental zone, and is located at the confluence of two smaller, unnamed tributaries of Cane Creek. Cane Creek is an important drainage in this portion of the Powell Valley, with minor floodplains and terraces that are sometimes larger than the more entrenched Powell River to the east. The creek acts as a drainage for the unnamed valley that contains the entire town of Pennington Gap (between the western end of Chestnut Ridge and the North Fork of the Powell River), as well as for Poor Valley west of Ben Hur, where it emerges from Poor Valley through a gap in the Poor Valley Ridge at Ben Hur. The unnamed valley widens considerably west of the site as it approaches its confluence with the Powell River at Pennington Gap.

Site 44LE165 is located on the floodplain (first terrace) and second terrace adjacent to Cane Creek. The southern one-third of the site is cut by Route 58; it is bounded on the east and north by Cane Creek, on the northwest and west by Route 643 and the base of a small toe slope (associated with Poor Valley Ridge), and on the south by residential and commercial development. The secondary terrace is bounded on the northwest and west by an upland toe slope. Site soils are classified as Huntington Silt Loam, an alluvial bottomland soil commonly found on tributary floodplains. The site is covered with low grasses, with some bedrock exposed on the western toe slope.

REPORT ORGANIZATION

This report is organized in five chapters. Topics covered in these chapters include an introduction, research design and methods, a geomorphological description, excavations and results, artifact description, and a final chapter encompassing the research summary and conclusions. The Chapter 1 introduction includes a description of the site, the project area, and the environmental context, as well as a brief statement concerning the archaeological importance of the site. Chapter 2 details the research design used in the interpretation of the archaeological results. Integral to this research design are the discussions of previous research, field and laboratory data recovery methods, and artifact curation.

Chapter 3 presents the descriptive results of archaeological data recovery, including excavation strategy, geomorphology, chronology, excavation results, and feature descriptions. Chapter 4 contains the summary descriptions of the artifacts recovered from the site.

Chapter 5 summarizes the results of the research undertaken at 44LE165, and places them in the interpretive contexts established in the Chapter 2 research design. These contexts include settlement patterns and organization during the Late Archaic/Early Woodland Transitional period, and an examination of diachronic change from this period to the Middle/Late Woodland period as manifest in the artifact assemblages and features. Consultants reports covering geomorphology, archaeobotany, and lithic tool microwear analysis appear in Appendices B, C, and D.

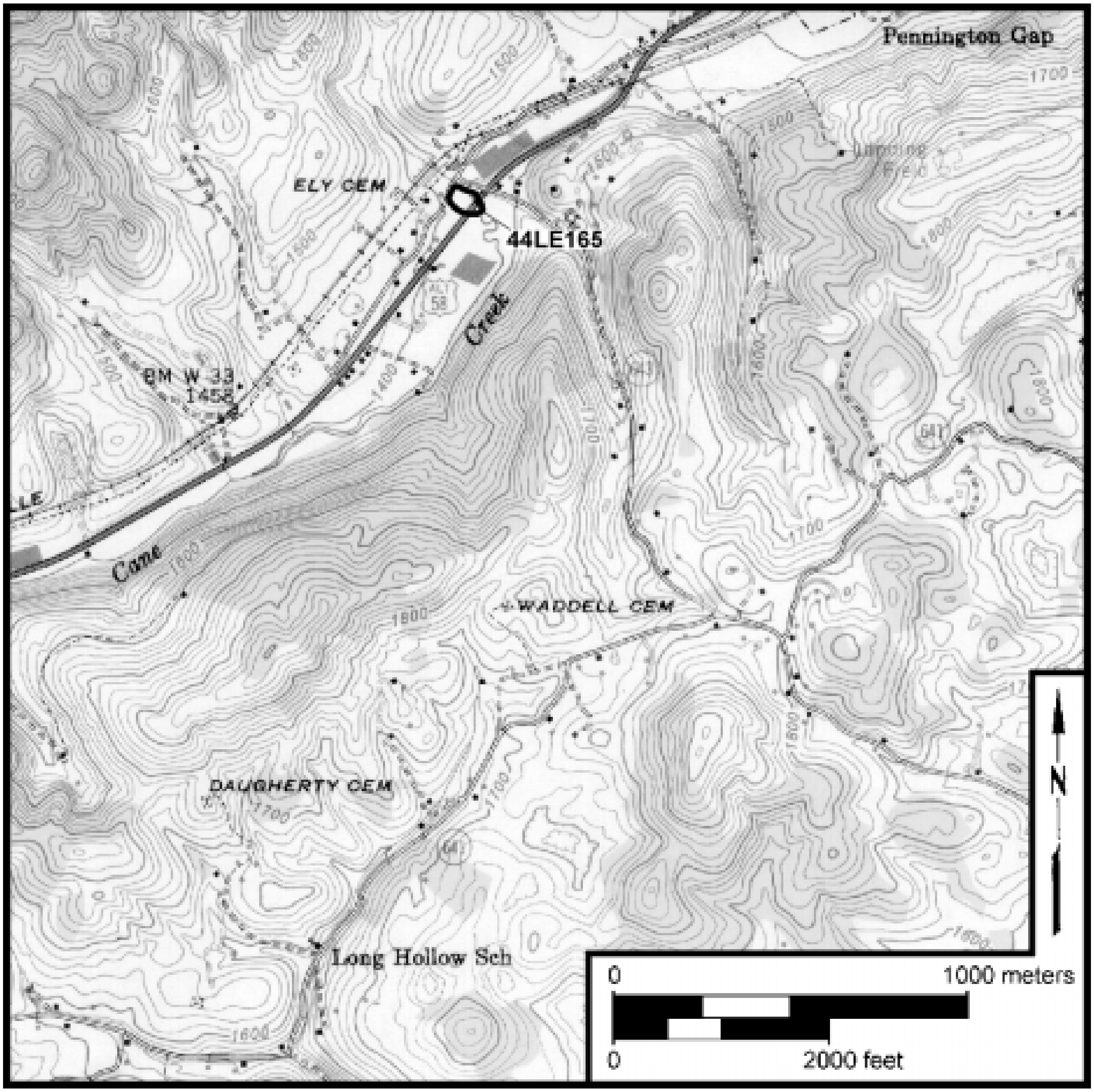


Figure 2. Project area and environs (U.S. Geological Survey 1969).

2 Research Design and Methods

PREVIOUS RESEARCH

Site 44LE165 was identified in January 1993 during a cultural resource survey of the proposed right-of-way by the WMCAR (Metz et al. 1993). Site identification and preliminary definition were accomplished through surface collection and systematic shovel testing. An exposed surface measuring about 1,000 m² had over 25% visibility and was surface collected. This surface collection and the excavation of 21 shovel tests yielded 143 prehistoric artifacts. Artifacts included flaked stone tools, debitage, and a single piece of fire-cracked rock. Evidence for a number of reduction stages in the lithic manufacturing/maintenance cycle was present, including raw material testing, tool manufacturing, and tool resharpening. Two diagnostic hafted bifaces were identified, including a Savannah River (ca. 2500–1600 BC) and a large Middle Woodland triangular hafted biface (ca. 300 BC–AD 800). The site components were determined to have research potential regarding prehistoric settlement in the region. Based on the potential for intact subsurface features and deposits associated with the prehistoric components, the site was judged potentially eligible for the National Register of Historic Places (NRHP) under Criterion D.

The WMCAR conducted an archaeological evaluation of 44LE165 in May 1994 (Peterson and Pullins 1995). The excavation of 80 shovel tests and four 1-×-2-m test units resulted in the recovery of 2,675 prehistoric artifacts. The site is characterized by relatively high artifact concentrations; as many as 46 prehistoric artifacts were recovered from a single shovel test. At least three discrete activity areas were identified by high artifact frequencies in shovel tests. Test Units 2 and 3 were placed in the center of two of these areas; artifact densities in these two units were the highest on the site (n=711 and n=793 respectively). Artifact densities for the intact Stratum B levels of these two units were 832/m³ for Test Unit 2 and 275/m³ for Test Unit 3. A layer of rock and cobbles intermixed with prehistoric artifacts was identified beneath the plowzone in Test Unit 2, and a single posthole was identified in Test Unit 3. Diagnostic artifacts recovered from the plowzone of Test Unit 3 include a small triangular hafted biface (Late Woodland), a Yadkin Eared hafted biface (Middle to Late Woodland), an Early Woodland stemmed hafted biface, and two pieces of shell-tempered ceramics. Below the plowzone, a beveled hafted biface fragment that appears to represent an Early Archaic style was recovered from Stratum B. Diagnostics recovered from the plowzone of Test Unit 2 include a possible Bradley Spike hafted biface (Early Woodland). Another area of interest includes the thicker subplowzone deposits identified in Test Unit 1 near the edge of the Cane Creek tributary. Although artifact densities are lower, the intact deposits were thicker, more organic, and contained datable material that returned a corrected, calibrated radiocarbon date of 370 BC – AD 370 at 2 sigma standard deviation (Beta-73167). A single shell-tempered sherd was recovered from Level A6 of Test Unit 1, 5 cm above the carbonized material used for the radiocarbon date.

Chronological indicators include a small triangular hafted biface (Late Woodland, AD 900–1607), a Yadkin Eared hafted biface (Middle to Late Woodland, 500 BC – AD 1607), two unidentified Early Woodland Stemmed hafted bifaces (1000–500 BC), a possible Bradley Spike hafted biface (Early Woodland, 1000–500 BC), and the beveled Early Archaic hafted biface fragment described above (8000–6500 BC). Only three ceramics were recovered from the site, all of them unidentifiable shell-tempered ceramics that probably date from the Late Woodland period (AD 900–1607).

The typical soil profile consisted of thin humus above A-horizon soils, ranging from brown to dark brown (10YR4/3 to 3/3) silty loam (Stratum A plowzone) to dark brown (10YR3/3) silty clay loam (Stratum B). The Stratum A plowzone averaged about 32 cm thick, and unplowed Stratum B soils were generally 11 cm thick. Soil deposits were thicker in Test Unit 1, adjacent to the unnamed Cane Creek tributary; Stratum A measured 53 cm thick, and Stratum B was 15–30 cm thick. B-horizon soils (Stratum C) consisted of dark yellowish brown (10YR3/6 to 4/6) silty clay subsoil found at about 43 cm below ground surface, except in Test Unit 1 where it was 68–90 cm below the ground surface.

The lithic assemblage, overall, has resulted from a range of activities that appear to have focused on early-stage production and manufacturing to a greater degree than tool use. However the presence of both bifacial and scraping tools indicates some activity diversity at the site. There is clearly an intact stratum at the site that can be associated with an Early to Middle Woodland occupation. The rock concentration in Test Unit 2 and shallow posthole in Test Unit 3 indicate the presence of preserved cultural features. Current evidence tends to support a reconstruction of repeated limited-activity (but intense) use of the site over time. The three different high-density loci, combined with the large site area overall (9,120 m²), suggest that site reuse may not have overlapped horizontally in all cases. The location on the alluvial bottomland soils raises the possibility that farming may have taken place during the later occupations as well.

RESEARCH DESIGN

The unique character of southwestern Virginia's prehistoric sequence has been discussed by a number of researchers who have suggested both physiographic/environmental variables (Bott 1981) and socio-cultural variables (Egloff 1990) as significant influences. These observations lead, quite naturally, to an expectation that the prehistoric settlement and subsistence systems in this area may have differed somewhat from other areas in the state. For the most part, however, models of Archaic and Woodland settlement and subsistence have not attempted to accommodate these anomalous features, with Egloff's Late Woodland synthesis as a notable exception (Egloff 1992).

From the data and analyses presented in Peterson and Pullins' examination of archaeological sites in the Powell Valley in general and nine sites in the Pennington Gap/Dryden area specifically (1995), a preliminary model for the Powell River Valley in Lee County has been generated. Site locations can be described with reference to a series of microenvironmental categories and the critical resources within close proximity (soils, cryptocrystalline lithic materials, water, aquatic and terrestrial fauna, and wild plant resources). The current sample of known prehistoric sites is taken to be representative of sites within the Powell River Valley, although local resources will undoubtably differ to some degree. The resulting settlement pattern demonstrates a significant degree of continuity, with many individual sites characterized by multicomponent occupations. In general terms, Archaic expansion into the Powell Valley is characterized first as generalized foraging across a number of ecological zones during the Early Archaic, followed by increasingly sedentary use of the upland zones during the Middle Archaic, and then expanding exploitation of riverine areas during the Late Archaic; in other words, exploration, adaptation, and expanded settlement. Woodland settlement continued to utilize many of the same physiographic zones as Archaic peoples, but the nature of this utilization changed with an increasingly generalized use of riverine environments (as villages), and an increasingly specialized use of upland environments (such as farmsteads or hamlets).

At 44LE165, the Late Archaic/Early Woodland Transitional component has the greatest integrity and research potential. Specific questions that will be addressed through data recovery at 44LE165 include the following.

1. Little is currently known about the structure of the smaller but intensively used tributary floodplain/terrace settlements during the Late Archaic/Early Woodland Transitional period. Most studies in such physiographic environments have been at the identification and evaluation level, establishing the presence of sometimes intensive scatters of tools and lithics, along with several "activity areas" of high-density artifact concentrations. Questions related to site organization, as well as the nature and range of activities beyond lithic reduction, remain unanswered. What activities were carried out at these loci? How permanent was the occupation? Are these "activity areas" functionally distinct, or are they redundant manifestations of multiple reoccupation? How are these activity areas organized? When site function and organization are considered in conjunction with the results of ongoing work in the Powell Valley (especially that related to other ongoing excavations associated with the Route 58 project), then we can begin to address more diachronic questions regarding the mechanisms and direction of changes in settlement patterns discussed above.
2. Interpretation of site function relies at least partially on the identification of tools and identifying the ways in which they were used. Recent advances in microwear analytical techniques combined with new ways of thinking about which variables may have been the most important in affecting decisions about lithic technology have raised fresh avenues of inquiry pertinent to analy-

sis of the lithic assemblage from 44LE165. Interpretation of site function and the recovery of component-specific assemblages should provide the raw data necessary for generating meaningful results from microwear analysis of tools, and in turn providing critical information for the interpretation of site function.

Approaches used to address these issues are outlined below.

1. Examination of Site Structure: Establishing the function and organization of occupations at these small tributary-based sites is difficult at best, in particular due to poor organic preservation and lack of features. The primary methods that will be used to overcome these limitations will be enhanced control over artifact provenience and recovery of microdebitage in an effort to elucidate site function and structure. A small test block will be excavated at the two primary activity areas identified during the archaeological evaluation of the site to determine the best location for large-scale block excavation. A large block will then be excavated at the activity area with the greatest integrity and potential to inform on the research questions. The sheer quantity of artifacts previously encountered in these activity areas, even beneath the plowzone, precludes piece-plotting of every artifact. However, artifacts other than debitage (tools, ceramics, fire-cracked rock) recovered from **intact subplowzone strata only** will be piece-plotted in three dimensions within each unit in the block to augment standard vertical control in natural strata. As an added control, a measured volume of each unit level will be water-screened through 0.125-in. or window screen using a water pump and the creek adjacent to the site. This will facilitate the recovery of microdebitage and refine our understanding of activity area organization. The goal of this two-stage approach will be to capture the core and primary fringes of an activity area to address temporal, functional, and organizational questions regarding the Early/Middle Woodland component. This technique has been previously used with success in the analysis of site structure and organization of a small Late Woodland campsite in Wise County (Pullins 1994), and the relatively thin layer of intact soils beneath the plowzone makes 44LE165 particularly suitable for this type of analysis.

   In addition to the archaeological analysis of the activity areas, examination of soils and stratigraphy exposed in the two deep Gradall trenches can enhance our understanding of the site formation processes, which is in turn important for interpreting the area's long-term human occupation. Such processes have important implications not only for understanding prehistoric land use, but also for interpretation of the archaeological patterns identified on the site. The goal is to examine the middle and late Holocene depositional history of the landform, both through the examination of deep-trench profiles and through particle size and chemical analysis.
2. Examination of Site Function: Microwear analysis of lithic tools can potentially provide accurate information about tool function independent of tool form. For example, there are diagnostic microwear signatures that can be identified along the cutting edge of a tool that was used in butchering, which can be contrasted with microwear found on a hafted biface that indicates its use as a projectile point (Kay 1996:340). Furthermore, experimental "blind tests" of microwear interpretations have shown that microwear techniques are fairly accurate at identifying not only the action with which the tool was used (e.g., scraping, chopping, cutting, sawing, whittling, or skinning), but also the material on which the action was performed (e.g., bone, antler, meat, fat, hide, wood, and some plant materials) (Keeley 1980:15–83). The key to the usefulness of these results is the tool context and associated structural patterns of site use. Tools will be selected from representative cultural components and contexts to examine site activities within individual cultural components, as well as diachronic variability in site function.

DATA RECOVERY METHODS: FIELDWORK

Fieldwork within the boundaries of this site was be intensive and is designed to examine site function as well as to recover significant evidence of depositional history within the cultural deposit (Figure 3). Large-area excavation is the primary strategy for archaeological data recovery, and machine-excavated, trench-based exploration is the primary means for studying physical structure and landscape evolution. As the excavation

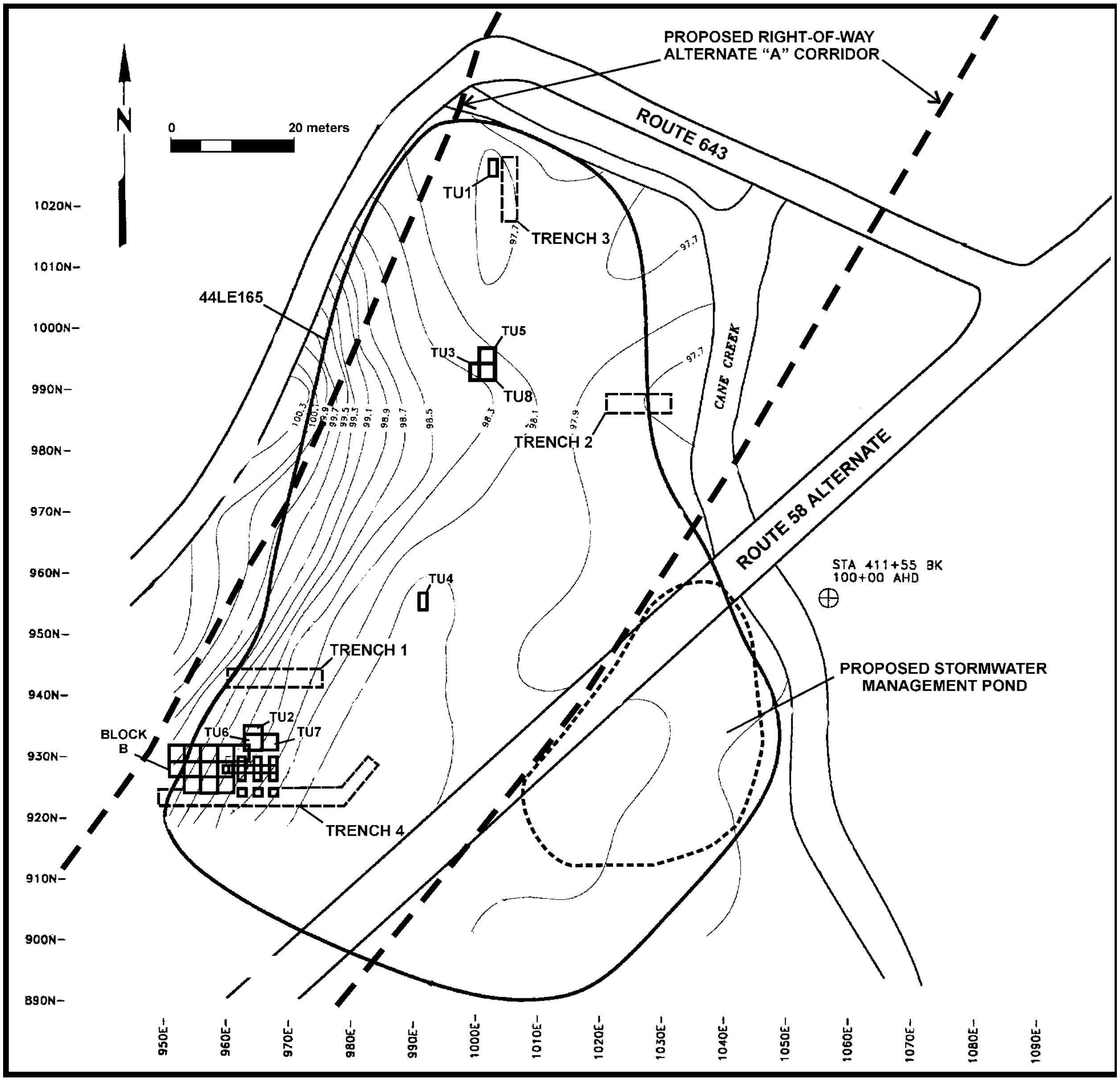


Figure 3. Site 44LE165, plan of excavations.

proceeded, it was necessary to modify the approach as new information became available.

Based on the shovel tests on a 10 m interval grid and four 1-×-2-m test units excavated during the Phase II evaluation of this project (Peterson and Pullins 1995), 44LE165 appeared to be comprised of two primary activity areas within the proposed right-of-way along Cane Creek (Figure 4). Phase II results documented soil strata that consist of a plowzone (Stratum II) overlying 0.10 to 0.20 m of unplowed deposits (Stratum III), underlain by a clayey subsoil. After the site datum was identified and the Phase II grid re-established, the initial excavation plan for the data recovery was to excavate two 2-×-2-m test units at each of the two activity areas (Test Units 5–8), screening the plowzone (Stratum I/II) in one of the two units at each activity area. Stratum III was then carefully excavated in 1-×-1-m sections by 0.10 m levels, and all non-debitage artifacts were piece-plotted in three dimensions for all four of the test units. A 6-liter soil sample was taken from each 1-×-1-m quarter of each test unit to document microdebitage distributions.

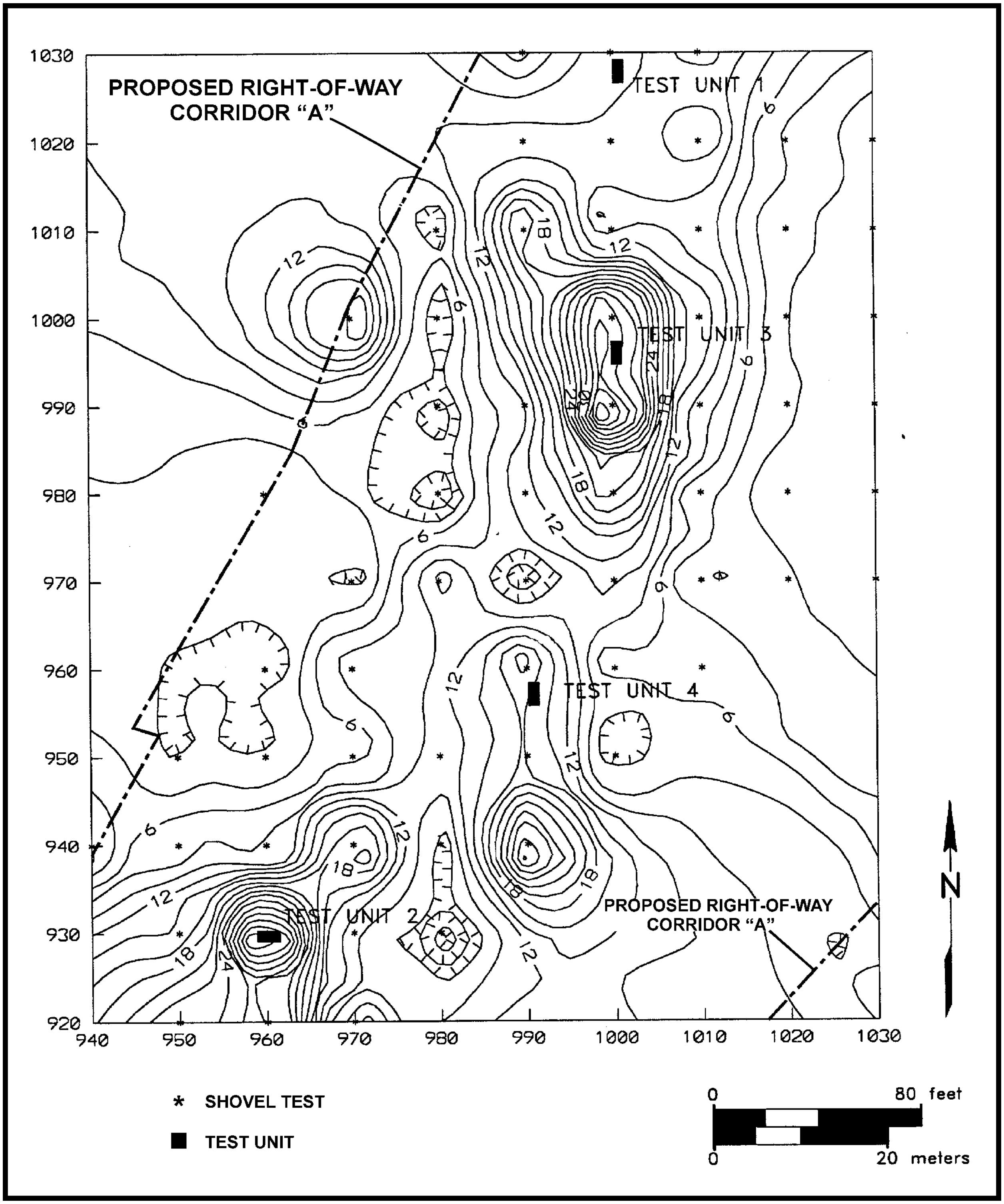


Figure 4. Site 44LE165, distribution of artifacts from evaluation shovel tests (Peterson and Pullins 1995:98).

At this point, the activity area that produced the best information was to be expanded into a larger block to closely document the structure and function of the activity area. Stratum III in the activity area tested by Test Units 5 and 8 (and Phase II Test Unit 3) contained few artifacts; Test Units 6 and 7 (and Phase II Test Unit 2) clearly had a greater potential for useful information. However, it was discovered that Stratum III did, in fact, contain historic artifacts, and did not represent an intact subplowzone deposit. The decision was made to continue with the excavation plan at Test Units 6 and 7 by expanding the block with nine additional 2-×-2-m test units (Test Units 9–19). The plan was to excavate and screen the southeast quarter (1 × 1 m) of each new test unit to obtain an adequate plowzone sample, and then excavate and discard the remaining plowzone sample (including Stratum III) to reveal any features that might be present in the block beneath Stratum III. The plowzone level (Strata I, II, and III) in the southeast quarter of Test Units 9–17 was excavated and screened; the plowzone from the north half and southwest quarter of Test Units 9–14 was removed and discarded. This excavation created a 4-×-6-m block stripped to the base of the historically disturbed deposits that joined with Test Units 2, 6 and 7 at the same level.

As Strata I, II, and III were removed as a single historically disturbed layer, it became apparent that Test Units 9–14 did not overly subsoil, as in Test Units 6 and 7, but contained additional stratigraphy not identified elsewhere on the site. The excavation plan had to be modified again, this time to accommodate the discovery of these localized deposits. Excavation was begun on the northwest quarters (1-×-1-m units) of Test Units 12, 13, and 14 to investigate these previously unknown deposits. Strata IV-a and IV-b were identified, and contained notable amounts of prehistoric artifacts (and no historic artifacts). Since excavation was being conducted in these units primarily as an exploratory tool to define extent and content, excavation proceeded by stratigraphic level, with no arbitrary levels. Strata IV-a and IV-b were very similar in color and texture, with differentiation based primarily on the presence of heavy concentrations of rock in Stratum IV-b. Stratum IV-a was terminated in all three 1-×-1-m subunits at this rocky level, and the excavation of Stratum IV-b initiated. When the northeast quarters of Test Units 12, 13, and 14 were excavated (forming a 1-×-6 m trench), it was discovered that there was a lens of rock-bearing soils within Stratum IV-a, primarily in the northwest quarter of Test Unit 14 and the northeast quarter of Test Unit 12, that was mistakenly included with Stratum IV-b, along with another layer of very similar soil between the rock-bearing lens and Stratum IV-b (Figure 5). The rock lens and everything beneath it were excavated as Stratum IV-b; descriptions are given for unrecognized strata within Stratum IV-b as IV-b(a), IV-b(b), and IV-b(c). Stratum IV-b(c) describes the stratum identified everywhere else as Stratum IV-b. Stratum IV-b was not excavated in the north half of Test Unit 13.

Next, the decision was made to strip the plowzone level (Strata I, II, and III) and expose Stratum IV. As will be discussed below, Stratum IV-a contained few tools or diagnostic artifacts, and the excavation of Stratum IV-a in Test Unit 18-NE (a 1-×-1-m unit) revealed a rather homogenous distribution of artifacts within the stratum. Since postmold features had been discovered at the base of Stratum IV-b, it was decided to strip away Stratum IV-a along with the plowzone stratum and focus data recovery efforts on Stratum IV-b, which appeared to have greater archaeological potential based on the presence of diagnostic artifacts and features. Figure 6 shows the west profile of Test Unit 18-NE at the base of Stratum IV-a, including the excavated plowzone (Strata I–III) and Stratum IV-a in the profile, and the top of Stratum IV-b at the base of the unit.

Trench 4 was excavated with a backhoe in conjunction with the excavation of a series of 21 shovel tests to determine the extent of the Stratum IV-b deposits (Figure 7). The shovel tests were excavated for stratigraphic purposes only, and were not screened. An area of Stratum IV-b deposits measuring approximately 13 m across was defined. In Figure 8, Stratum IV-b appears as a darker area.

Once the extent of the Stratum IV-b deposits had been estimated, a block of 12 test units referred to as "Block B" was established (Figure 9). Stratum IV-b was excavated in 0.10 m levels within Stratum IV-b in each 2-×-2-m unit. This excavation was designed to investigate the occupation associated with the postmold features originally identified in Test Unit 12. The research questions outlined in this report are applied primarily to this occupation, which serves as the focus of the investigations at 44LE165.

In addition to these excavations, three other deep trenches were excavated by a Gradall at various locations across the site as part of the geomorphological investigations (see Figure 3).

Certain standard procedures were followed during the above-described excavations. Features encountered were investigated following a standardized procedure where possible. Each was first recorded in plan with scale drawings and photographs. One half of the fea-

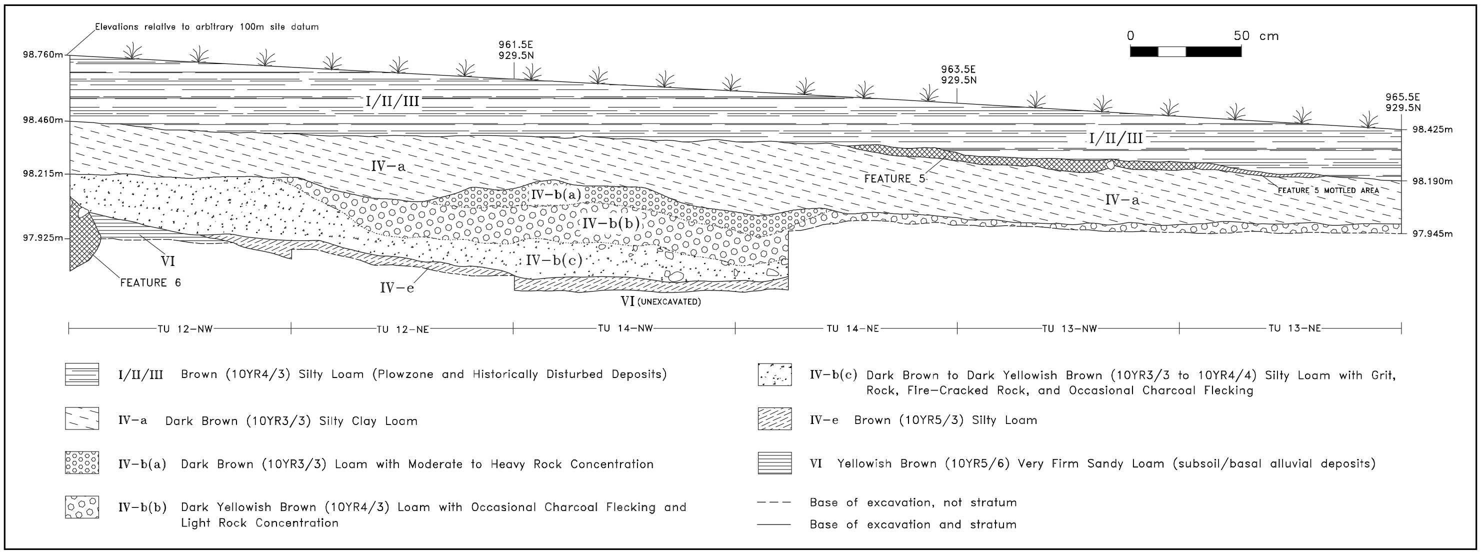
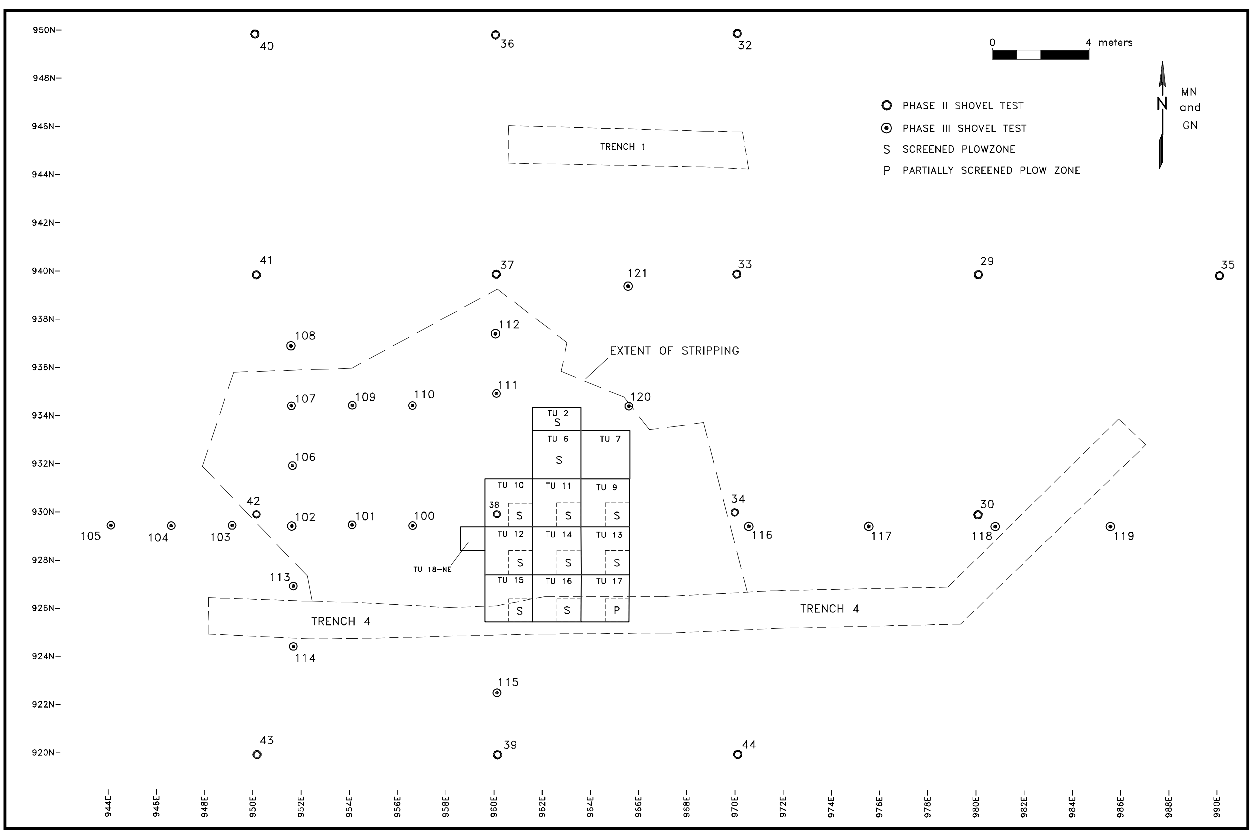


Figure 5. Site 44LE165, Test Units 12, 13, and 14, north profile.

Figure 6. Site 44LE165, Block B, Test Unit 18-NE, west profile at the base of Stratum IV-a.

Figure 7. Site 44LE165, plan map of initial block, shovel tests, and location of Stratum IV-b.



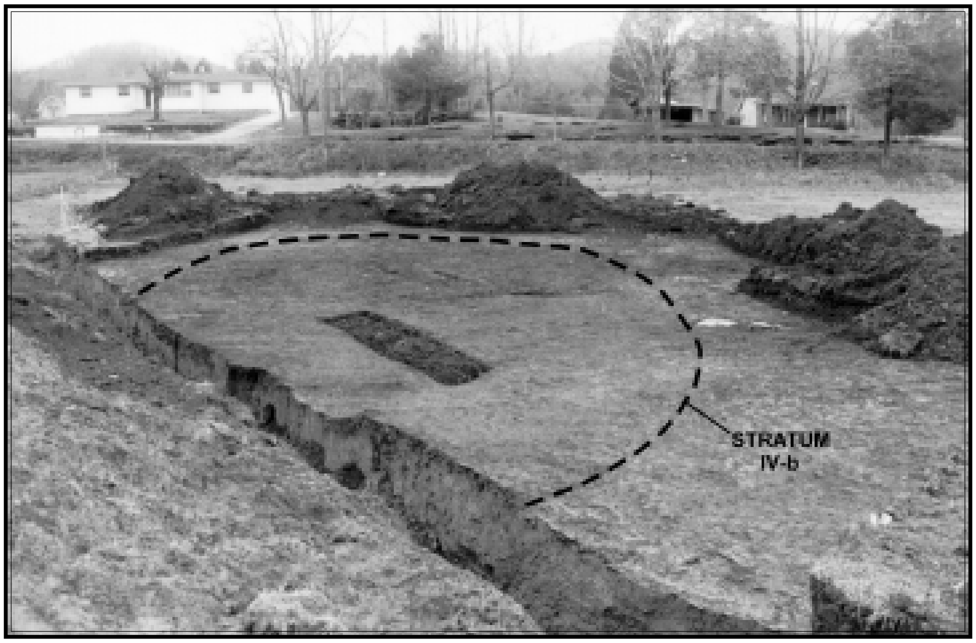


Figure 8. Site 44LE165, Block B, stripped surface (top of Stratum IV-b).

ture was then removed to reveal a cross-section profile, which was in turn also recorded. When warranted, the remaining feature fill was removed and final drawings and photographs made. All fill was removed according to natural strata if present and was screened through 0.25-inch mesh. A portion of the fill, however, was collected for the water-screening process, radiocarbon, and/or other special samples when warranted.

In test unit excavation, the plowzone was removed and screened through 0.25-in. mesh in selected contexts; plowzone soils for the remaining units were discarded (see Chapter 3). In the subplowzone levels of each 2-×-2-m unit, a 6-liter sample of soil from each unit was obtained for particle size, chemical, and microdebitage analysis. Representative profiles were documented with scale drawings, and black and white photograph and color slide photography. Soils were described using standard Munsell color and USDA textural terminology. Special samples were collected as warranted for soils analysis and radiocarbon assay.

DATA RECOVERY METHODS: LABORATORY ANALYSIS

The first step was to record the standard descriptive parameters of all recovered artifacts. The WMCAR has developed a hierarchical coding system which operates using Paradox data base software. With this system, artifacts are coded during analysis on standard data sheets for entry into a data file. Using this file, overall project inventories as well as particularistic data reports can be readily generated for inclusion in reports or routine analysis. Basic categories identified are described below. In addition, soil samples for chemical and physical analysis will be submitted for analysis at the Virginia Polytechnic Institute.

Prehistoric Lithic Artifact Analysis

Beyond the categories described, all lithic debitage and tools are identified according to raw material type. Basic metric attributes were recorded for at least a sample of the diagnostic items.

Debitage

Debitage is the by-product of stone tool manufacture. To make a stone tool, the tool maker strikes the selected stone with another stone or other object, such as a deer antler. The impact causes pieces, or “flakes,” of the impacted stone to break away, which can eventually allow the impacted stone to be shaped into a tool such as a spear point, knife, or scraper. Alternatively, another common stone tool manufacture strategy involves striking flakes from the impacted stone that are used immediately as expedient flake tools or as blanks for further reduction into tools such as hafted bifaces. Thus, depending on the specific stone tool reduction strategy and raw material, the flakes of stone may be waste, they may be utilized as expedient tools, or they may be further reduced into formal tools. Stone tool manufacture requires several different stages of reducing the raw material to a finished product, and the resulting debris is often distinguishable from one stage to another. Identifying and analyzing these subcategories of flakes, as well as the different stone tools themselves is important for understanding how prehistoric hunter-gatherers made and used their tools.

Analysis of flakes involves observation of certain morphological characteristics. Each flake has two sides. The dorsal side, usually convex, is part of the outer surface of the stone from which the flake was struck. The ventral or interior side, usually concave, is the surface that was detached from the original stone. The platform is essentially the point of impact, recognized by a "shelf" at one end of the flake. The bulb of percussion, also known as bulb of force, is a swelling on the flake created by the initial passage of force through the stone from the blow necessary for flake removal. Lipping is a ledge that sometimes occurs near the platform and at the top of the bulb of percussion.

Primary/Reduction Flakes are formed during the first stage of stone tool manufacture, which entails the relatively quick removal of the unwanted outer part of the stone. Such flakes are placed in this category largely by default; in other words, they are identifiable as flakes but do not qualify as secondary/thinning, tertiary/retouch, or bipolar flakes. General identifying

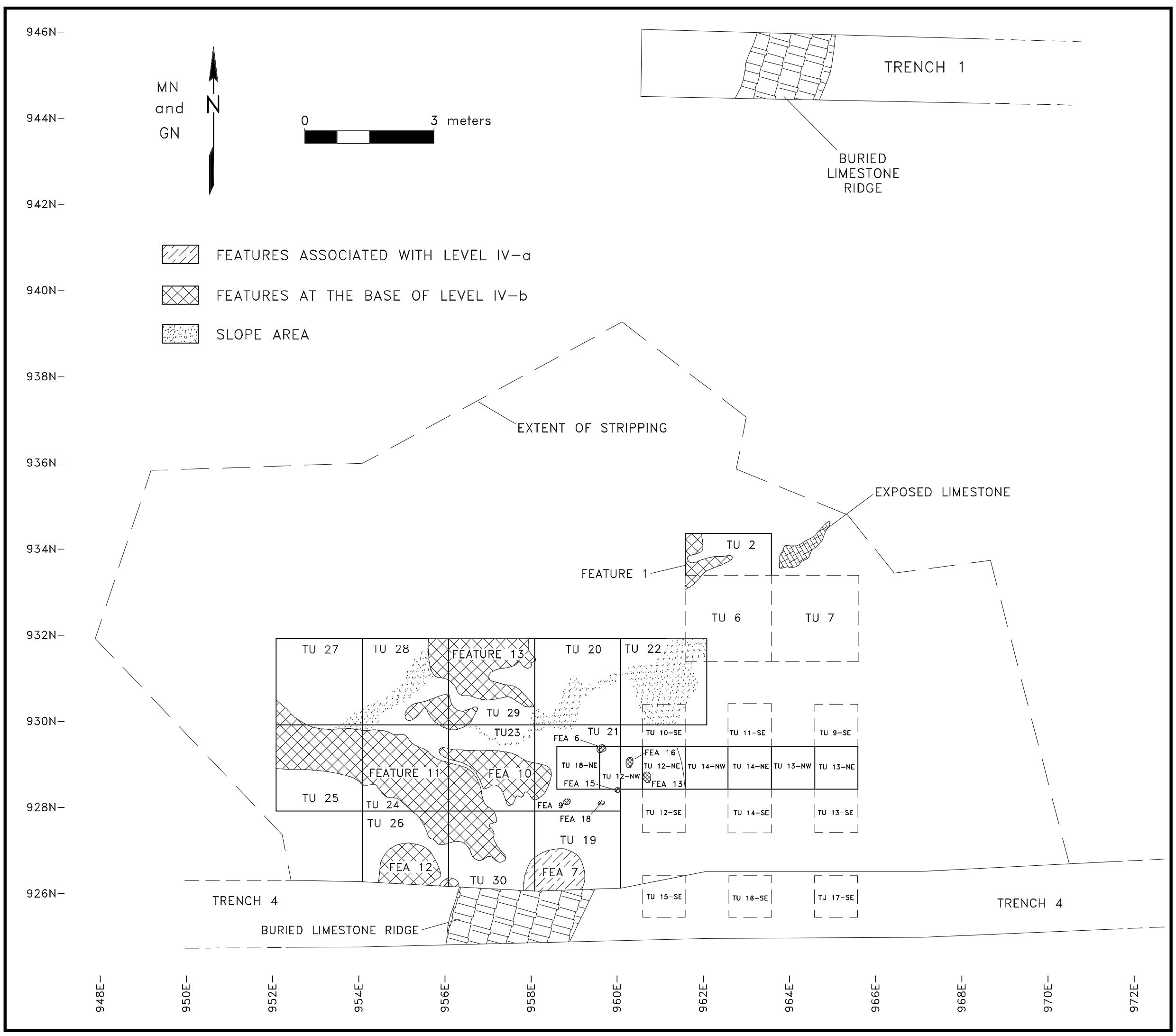


Figure 9. Site 44LE165, Block B, plan.

characteristics, however, are relatively obtuse platforms without lipping, a pronounced bulb of percussion, and a relatively thick cross-section. Flakes in this category are interpreted primarily as the by-products of early-stage reduction, owing largely to their tendency to exhibit simple platforms and pronounced features such as ripples and bulbs of percussion.

Secondary/Thinning Flakes are indicative of more controlled flake removals, intended to refine the tool's shape. These flakes are often associated with the production of bifaces—that is, stone artifacts that have been flaked along both faces/sides of an edge. Secondary flakes are identified most readily by their acute, lipped, and generally multifaceted platforms. Such platforms are segments of biface margins removed on impact. Biface thinning flakes are also relatively thin and flat or slightly curved in cross-section. The bulb of percussion is diffuse. Two forms of this flake type commonly occur. One is the better-known, lipped flake with a multifaceted platform. The other resembles a fish scale in plan view; while often lipped, lipping is very slight, and the platforms typically are narrow and curvate or recurvate. These flakes are generally considered to result from thinning and resharpening relatively refined, mid- to late-stage bifaces.

Tertiary/Retouch Flakes are recognized as the by-product of tool retouch or resharpening. They exhibit small, point platforms that are usually lipped, an outline that expands from the platform toward the termination, a thin cross-section, and small size (generally not more than 5 mm in the longest dimension).

Bipolar Flakes are distinctive, but care must be taken to avoid classifying them as shatter or angular fragments, particularly if they are of quartz. They are the by-product of a tool-making technique that involves striking the stone at one end while the other end is supported by another stone. Bipolar flakes have virtually no bulb of percussion and often are long and narrow or wedge-shaped. Another distinctive feature is distinct radial lines below the points of force, and many times they exhibit crushing at opposing ends.

Flake Fragments/Shatter are non-diagnostic medial and distal fragments of broken flakes. Virtually any portion of a flake minus a platform should go into this category.

Angular/Blocky Fragments, as the name implies, are angular/blocky chunks of stone that are probably the by-product of stoneworking but that cannot be identified as flakes or portions of flakes. These fragments are not to be confused with fire-cracked rock. They often occur when blocks or nuclei of poor-quality or internally flawed material are struck.

Blade-like Flakes are at least twice as long as they are wide and have long, parallel ridges or arrises on their dorsal surfaces, perpendicular to the platform. Assigning debitage to this category should be done conservatively, with the intention of identifying purposefully struck, linear flakes. Some evidence of platform preparation/ grinding is a valuable indicator of these flakes.

Prismatic Blades are highly standardized blade flakes with prepared platforms, prismatic cross-sections, and a high degree of uniformity in form.

Tested Cobble/Nodules are pieces of raw material that are unmodified beyond the removal of only one or a very few flakes. Presumably, they represent pieces that were tested for quality and discarded.

Tools

Utilized Flakes are flakes or flake fragments (shatter) that were utilized "as is" for cutting, scraping, etc. As such, they exhibit no intentional modification for hafting or sharpening. Instead, there is incidental damage to the edges resulting from use, which appears as very fine flake scars. These scars are invasive not more than 2 mm from the tool margin. Damage from screening, trampling, etc. can mimic such use damage when observed at the macroscopic level or under low-power magnification. To be conservative, all artifacts placed in this category during preliminary analysis must have regularized rather than intermittent or spotty damage to the edge. Utilized flakes are initially subdivided according to the form of the utilized edge. Potential forms are straight, concave, convex, or denticulate. In some instances, more than one of the utilized edge forms may be present.

Retouched Flakes differ from utilized flakes only in that they were intentionally modified prior to use. Flake scars on their edges are regularized but are invasive at *least* 2 mm from the tool margin. The same subcategories of edge form apply as well.

Other Bifaces are generally regarded as preforms or generalized bifacial tools (i.e., knives). They lack modification for hafting. Following Callahan (1979), bifaces can be classified according to stage in the reduction process. Only the first four stages of his five-part scheme are recognized in the analysis.

Hafted Bifaces are formal tools more commonly known as projectile points/knives. They are bifacial and are modified for hafting. Diagnostic or potentially diagnostic specimens (complete or proximal fragments whose characteristics can be associated with a particular culture or time period) are coded separately from non-diagnostic pieces such as tips, ears, etc.

Other Formal Tools are formed tools other than hafted bifaces or other bifaces. Items in this category include drills and endscrapers. In most cases, they exhibit modification for hafting.

Cores are the parent pieces from which potentially usable flakes are struck. Consequently, they are best recognized by the flake scars left by flake removals. Cores are classified here by the nature of the flake scar patterns evident on their surfaces. Random cores exhibit random flake removals. Lamellar cores are marked by regular, linear flake removals leaving parallel or subparallel flake scars. Bipolar cores are usually rather small and exhibit battering at opposing ends. One of the opposing edges is often a narrow, bifacial "crest," while the other is truncated and battered in appearance. Bifacial cores resemble thick, irregular bifaces (see Stage 2 of Callahan 1979). Tabular cores are those derived from plate-like cobbles or nodules. Flake removals are directed from the margins of the piece, which readily serve as platforms.

Other Lithic Artifacts

Formal Ground Stone items are modified by pecking and/or grinding rather than by flaking. The degree of modification is extensive—to the point that the original form of the stone from which the artifact was fashioned is obliterated. Typical artifacts include axes, celts, gorgets, and steatite bowl fragments.

Informal Ground Stone includes artifacts that have been modified by pecking and/or grinding but have not been formally shaped; they retain in large part the form of the unmodified stone from which they were made, such as a cobble or slab. These artifacts include hammerstones, simple grinding slabs and manos, and artifacts that are only *possibly* modified by grinding/pecking.

Fire-Cracked Rock is recognized as rough, blocky pieces of stone that has irregular fracture surfaces. In some cases, the stones may also be reddened from exposure to intense heat. This material is counted and weighed.

Other/Unmodified Stone represents miscellaneous rock recovered incidental to collection. It bears no evidence of modification. Such material can be also referred to as "manuports." Other/unmodified stone is counted and weighed.

Prehistoric Ceramic Artifact Analysis

Prehistoric ceramic artifacts will initially be classified primarily by description along two dimensions: temper and surface treatment. Whether the artifact was a vessel or other artifact fragment will also be noted and in the case of vessel fragments the specific portion was identified. At the initial level of analysis ceramic sherds will not be "typed" in the traditional sense but grouped according to temper/surface treatment. Subsequently their correlation with diagnostic types of the region will be discussed. Key references to be consulted during the analysis are Egloff's (1990) study of southwestern Virginia ceramics overview of Coastal Plain ceramics, Keel's *Cherokee Archaeology* (1976), and Holland's archaeological survey of southwestern Virginia (1970).

Ethnobotanical Analysis

Ethnobotanical remains recovered from selected contexts will be forwarded to a competent analyst experienced in the identification and interpretation of ethnobotanical materials. This report will be summarized and integrated into site interpretations in the main text; the full report will appear as Appendix C.

Lithic Microwear Analysis

Tools selected for lithic microwear analysis will be forwarded to a competent analyst experienced in the identification and interpretation of microwear evidence on lithic tools. This report will be summarized and integrated into site interpretations in the main text; the full report will appear as Appendix D.

ARTIFACT CURATION

All materials generated by this project will be curated according to standards outlined in 36 CFR Part 79 "Curation of Federally-Owned and Administered Archaeological Collections." All artifacts will be washed and placed in resealable polyurethane bags with labels. These will in turn be logically ordered in acid-free Hollinger boxes for permanent storage. They will be deposited with the VDHR unless the landowner requests them, and any such requests will be documented in writing.

3 Results of Excavation

EXCAVATION RESULTS

Three primary artifact-bearing soil units were identified at 44LE165 (Figure 10). The uppermost deposits include Strata I, II, and III, which consist primarily of the plowzone. Stratum IV-a is the initial subplowzone stratum, followed by Stratum IV-b, which is characterized by a very rocky soil. These strata were in turn underlain by subsoil, designated as Stratum VI. This section will summarize the general excavation results; detailed descriptions of site structure, organization and function will appear later in this chapter, and detailed artifact descriptions will appear in the following chapter.

Geomorphological Results

A brief investigation of site geomorphology was conducted by Daniel Hayes. A summary of his results is presented here; the complete report is contained in Appendix B.

The site appears to occupy two associated landforms, formed by alluvial processes associated with Cane Creek (Figure 11). The first and lowest included the present flood plain of Cane Creek, which consisted primarily of level ground. The second and higher included a remnant and eroded alluvial terrace that rose about 1-1.5 meters above the flood plain and articulated with the valley toe slope. The contact between terraces was subtle, and most evident in the change in surface grade (or slope), subsurface morphology, and archaeological content. Colluvial processes including sheetwash likely extended the toe slope onto the second terrace. A bedrock outcrop was exposed along a road which skirted the toe slope: bedrock broke the surface of the toeslope/second terrace in a few discreet locations. The modern surface of the site was plow disturbed.

The site contained a suite of fine-grained sediments which were primarily of alluvial origin. Flood deposition was dependent upon stream behavior, which was closely related to prevalent environmental conditions. Internal stratigraphy indicated the site to occupy a suite of different age strata that comprised a pair of overlapping alluvial terraces. Strata within these terraces were subjected to variable conditions of formation, occupation, weathering and disturbance. Within these contexts, the archaeological record reflected variable degrees of preservation. Several observations may be made concerning landform and archaeological site history.

The oldest remnant surface stratum included Stratum IV-b. This well developed, and eroded surface soil contained cultural materials which represented occupation of the valley into the Transitional/Early Woodland cultural period. Final development of this soil, and subsequent erosion of the surface, may possibly be attributed to relatively warm and dry climatic conditions ascribed to end of the Subboreal period, or “xerothermic interval” (Carbone 1976; Wendland and Bryson 1974), between approximately 4000–3000 BP (Knox 1983).

At some point during or after this occupation, active accumulation of fine alluvial and probable colluvial sediment occurred, which resulted in deposition of Strata IV-a and V, and selective preservation of Stratum IV-b. Archaeological content has indicated the deposition of Stratum IV-a to have likely occurred sometime during the Early Woodland period. The chronology of the untested Stratum V deposition is less clear. However, the accumulation of both strata demonstrate a significant change in depositional conditions during the late Holocene. It is possible that these changes are attributable to changing environmental conditions, particularly the proposed reestablishment of cooler and wetter (more modern-like) climate after about 3000 BP (Vance et al 1992, Knox 1993).

Disturbance processes dominate the historic record of site development. Cultivation of surface strata resulted in formation of Stratum II/I, which included various amounts of underlying Strata IV and V, depending upon landscape position. It also contained sediment deposited much later, which was subsequently mixed into the plowzone. Late deposition of flood deposits likely reflected both climatic conditions, and changes within the drainage basin affected by cultural utilization, both historic and possibly prehistoric.

Description of Stratigraphic Contexts

Plowzone Contexts

Strata I (humus), II (plowzone), and III (historically disturbed layer) are referenced as "plowzone contexts" in this report for analytical purposes. A combined total of 5036 prehistoric artifacts were recovered, including 68 pieces of miscellaneous/unidentified stone.

Stratum I. Stratum I is the humus layer present on some of the site margins, especially near the Cane Creek tributary. This stratum is usually about 0.03 m thick when present, and was included with the plowzone during test unit excavation. Stratum I consists of a dark yellowish brown (10YR4/4) silty loam.

Stratum II. Stratum II is the actual plowzone stratum, originally identified as "Stratum A" during the Phase II investigations (Peterson and Pullins 1995) (see Figure 10). This soil stratum consists of a brown (10YR4/3) silty loam, and is found over the entire site. The plowzone was excavated in 2-×-2-m Test Units 5, 6, 7, and 8, and in the southeast quarter of Test Units 9–17. The plowzone was screened through 0.25-in. mesh in all of these contexts except Test Units 7 and 8; screening of Test Unit 17-SE was discontinued before the plowzone was completely excavated. Plowzone thickness in Test Units 5–8 and 15–17 is about 0.22 m; in the southeast quarters of Test Units 9–14, the plowzone measurements are thicker because Stratum III was present and included as part of the plowzone (see explanation below).

Stratum III. Stratum III does not appear in Figure 10, but was originally identified as "Stratum B" during the Phase II investigations (Peterson and Pullins 1995). The stratum consists of a dark yellowish brown (10YR3/4) clay loam. This stratum was identified beneath the plowzone in Test Units 5–8 and in the southeast quarters of Test Units 9–14, and measured about 0.05 to 0.10 m thick. Stratum III was thought to represent undisturbed subplowzone soil, and was excavated and screened by 1-×-1-m quarter in Test Units 5, 7, 8, and the western half of Test Unit 6 (the eastern half was discarded). All artifacts except debitage were piece-plotted for this level. However, historic artifacts were recovered from this stratum in Test Units 6 and 9, and it was decided to include Stratum III with the plowzone context during the excavation of subsequent test units (hence, the "plowzone layer" in Test Units 9–14 consists of Strata I, II, and III and is thicker than other plowzone contexts). Stratum III was not identified in Test Units 15–17.

Stratum IV-a

Stratum IV-a consists of a dark brown (10YR3/3) clay loam that likely resulted from not only flood deposition, but also colluvial redeposition of fine-grained sediment eroded from the adjacent toe slope (see Figure 10). This stratum was not identified during the Phase II investigations (Peterson and Pullins 1995); during data recovery excavations, it was excavated only in 1-×-1-m Test Units 10, 12, 13, 14, and 18, and ranged from 0.20 to 0.32 m thick. Test Units 12, 13, and 14 were excavated by stratigraphic level; in Test Unit 18, Stratum IV-a was excavated in 0.05 m levels. The excavation in Test Unit 10 represents only a portion of the southwest quarter that was initially identified and excavated as a feature due to the small amount of exposed area at the time of discovery. A total 2797 prehistoric artifacts were recovered from this stratum, including 132 pieces of miscellaneous/unmodified stone.

Stratum IV-b

Stratum IV-b represents the uppermost extent of the underlying alluvial sequence at the site, and exhibits characteristics of a buried surface horizon (see Appendix B). This stratum was not identified during the Phase II investigations (Peterson and Pullins 1995). The stratum was excavated in 1-×-1-m Test Units 12-NE, 12-NW, 14-NE, and 14-NW, as well as in 2-×-2-m Test Units 19–25 and 28–30 (see Figure 10). In Test Units 12 and 14, Stratum IV-b actually consists of three layers that were excavated and inventoried as a single context. A total of 11,857 artifacts were recovered from this stratum, including 4002 pieces of miscellaneous/unmodified stone.

Test Units 12 and 14. Stratum IV-b in these units actually consists of three substrata that will be referred to as Strata IV-b(a), IV-b(b), and IV-b(c) for descriptive purposes (see Figure 5). Stratum IV-b(a) is a dark brown (10YR3/3) clay loam with a moderate to heavy density of rock measuring up to 0.12 m thick. This layer appears primarily in the northwest quarter of Test Unit 14, and partially in the northeast quarters of Test Units 14 and 12, and was identified only in Test Units 12 and 14 on the site. Stratum IV-b(b) is a dark yellowish brown (10YR4/3) clay loam with occasional charcoal flecking and a light density of rock. This stratum measures 0.18 m thick, and appears everywhere in Test Units 12 and 14 except the northwest quarter of Test Unit 12. Stratum IV-b(b) was identified only in Test Units 12 and 14 on the site.

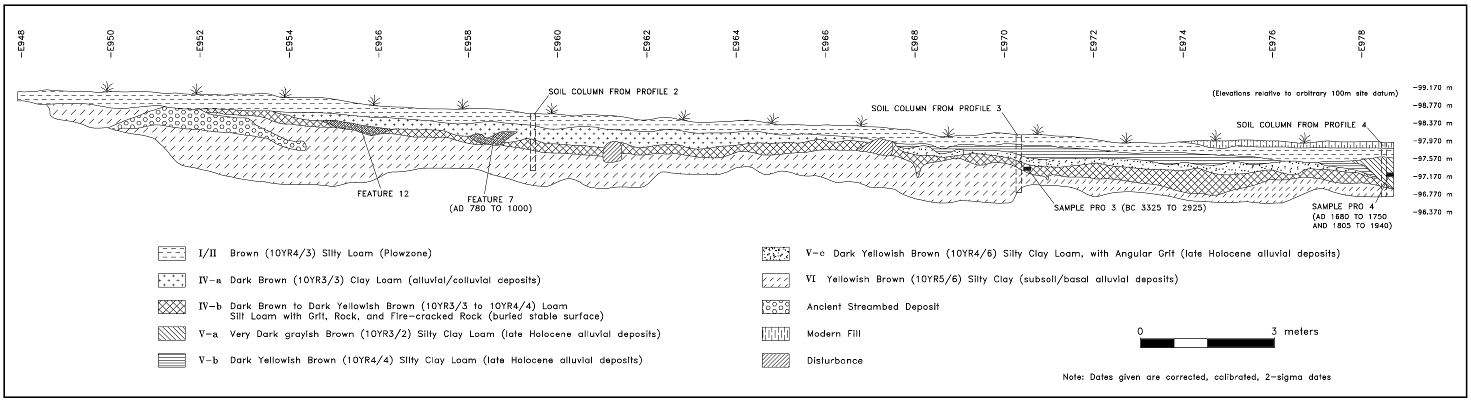


Figure 10. Site 44LE165, Trench 4, north profile.

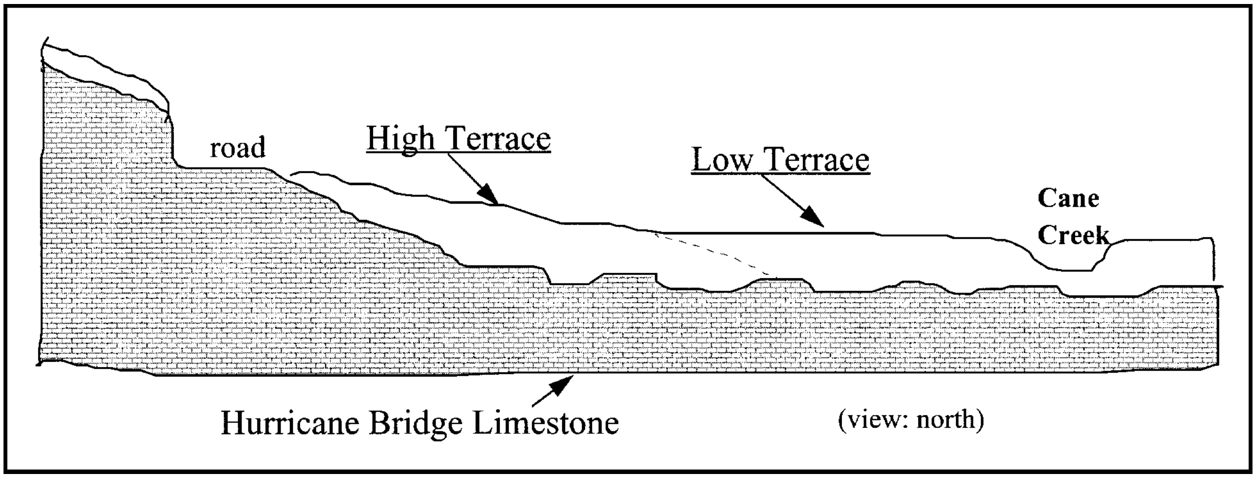


Figure 11. Site 44LE165, representative idealized cross-section.

Stratum IV-b(c) is a dark brown to dark yellowish brown (10YR3/3 to 10YR4/4) silty clay loam with grit, rock, and occasional charcoal flecking. This stratum measures as much as 0.26 cm in the western portion of the profile, thinning to 0.09 m at the eastern end (see Figure 5). This stratum is equivalent to Stratum IV-b in Test Units 19–30 described below, and appears not only in Test Units 12, 14, and 18–30, but also in the profile of Trench 4 (see Figure 10). Postmold Features 6 and 15–17 were identified at the base of Stratum IV-b(c).

A total of 3438 prehistoric artifacts were recovered from these three combined strata and Stratum IV-e (described below), including 385 pieces of miscellaneous/unmodified stone.

Test Units 19–30. Stratum IV-b consists of a dark brown to dark yellowish brown (10YR3/3 to 10YR4/4) silty clay loam with grit, rock, and fire-cracked rock. Test Units 19–30 were excavated after the plowzone (Strata I, II, and III) and Stratum IV-a were stripped from the block area with a smooth-bucket Gradall, exposing Stratum IV-b (see Figure 8). Figure 8 shows a view to the west, with Trench 4 in the foreground and Stratum IV-b as the darker area around Test Units 12, 13, and 14, north of Trench 4. A block of 2-×-2-m test units was placed at the western end of the 1-×-6-m trench formed by the excavation of Test Units 12, 13, and 14 described above (see Figure 9). Test Units 20 and 21 were excavated first, with additional block expansion based on excavation results and the thickness of Stratum IV-b.

Test units were excavated in 0.10 m levels within natural stratigraphy. The greatest volume of Stratum IV-b soil was excavated in Test Unit 23, with Test Units 25, 26, and 27 offering the shallowest deposits (Table 1). Test Units 26 and 27 were excavated to provide better exposure of Stratum VI in an effort to identify features and to reveal Feature 12; Stratum IV-b was discarded unscreened in these two units.

Test Unit 22 was rather sloped from very shallow deposits in the northwest corner to a deeper, terrace-like edge in the south and east. The thickness of Stratum IV-b in the northwest corner was 0.09 m; in the southeast corner, the base of Stratum IV-b was not reached until 0.37 m below the stripped surface. Figure 12 illustrates the topography of this test unit, which identified either a sinkhole or depression edge and which marks the easternmost extent of the Block B excavation. This edge was also identified in Test Unit 12-NE, though it was not as pronounced. The rocky slope identified in Figure 12 was also identified in other test units, though these slopes were more “ledge-like” in nature and did not preface a terrace edge. They appear primarily in test Units 20 and 28 (see slope area in Figure 9) and are visible in Figure 13; Test Unit 22 is in the lower left of the photo, and Feature 13 is the rock mass in the upper right. Note the steep slope and dropoff in Test Unit 22.

Feature 7 is a large pit feature identified partially within Stratum IV-a that is intrusive through Stratum IV-b. Ten additional features were identified within or at the base of Stratum IV-b, including four noted earlier in Test Unit 12. As Stratum IV-b was exposed in each unit, three consolidated masses of stone were noted within the level in Block B and were designated as Features 11, 12, and 13 (see Figure 9). Features 6, 8, 9, 15, 16, and 17 are a cluster of postmolds identified at the

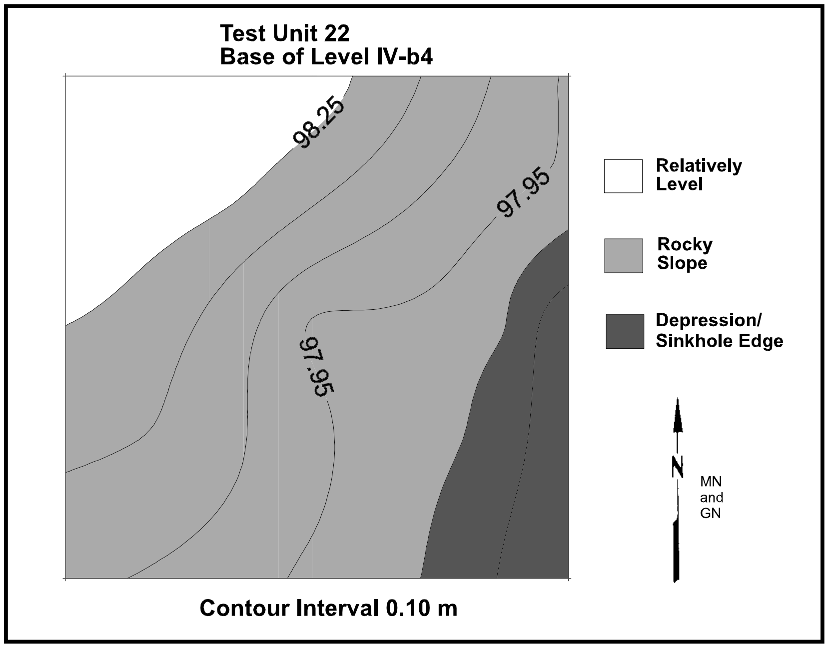


Figure 12. Site 44LE165, Block B, Test Unit 22, showing slope and possible sinkhole edge.

base of Stratum IV-b. Feature 10 represents a tree disturbance at the base of Stratum IV-b that was not excavated.

Stratum IV-b was excavated in 0.10 m levels (IV-b1, IV-b2, etc.). Test Units 26 and 27 were excavated, but discarded and not screened. A total of 2665 prehistoric artifacts and 1865 pieces of miscellaneous/unmodified stone were recovered from the screen in Level IV-b1, identified in all ten test units. Level IV-b2 was excavated in all units except Test Unit 20 and 25, where Stratum IV-b was no longer present. A total of 1125 prehistoric artifacts were recovered from this level, in addition to 1311 pieces of miscellaneous/unmodified stone. Level IV-b3 was excavated only in Test Units 19, 22, 23, 24, and 28, where a total of 270 prehistoric artifacts and 410 pieces of miscellaneous/unidentified stone were recovered. Finally, Level IV-b4 was excavated only in Test Units 22 and 24, where 18 prehistoric artifacts and 31 pieces of miscellaneous/unidentified stone was recovered. Overall, a total of 4078 artifacts and 3617 pieces of miscellaneous/unmodified stone were recovered from Stratum IV-b in these test units. In addition, flotation of a six liter soil sample from one level in each of the test units recovered 723 pieces of additional prehistoric debitage.

Test Unit/ Level	Dimensions (m)	Volume (m^3)
19*/IV-b	3 × 0.280	0.840
20/IV-b	2 × 2 × 0.146	0.584
21/IV-b	2 × 2 × 0.194	0.776
22/IV-b	2 × 2 × 0.184	0.736
23/IV-b	2 × 2 × 0.282	1.128
24/IV-b	2 × 2 × 0.196	0.784
25/IV-b	2 × 2 × 0.102	0.408
26/IV-b	2 × 2 × 0.116	0.464
27/IV-b	2 × 2 × 0.112	0.448
28/IV-b	2 × 2 × 0.152	0.608
29/IV-b	2 × 2 × 0.138	0.552
30/IB-b	2 × 2 × 0.210	0.840

NS=Not Screened

*Feature 7 comprised approx. 1 m^2 of area in Test Unit 19; volume for Test Unit 19 is therefore based on an estimated area.

Table 1. Site 44LE165, Block B, Test Units 19-30, Stratum IV-b, unit volumes excavated.

Stratum V

Stratum V was identified only in the eastern portion of Trench 4, and did not appear in any test unit. Based on the geomorphological results (see Appendix B), this stratum probably represents a late Holocene resurgence in flood deposition across the lower terrace. Three distinct substrata were recorded (V-a, V-b, and V-c). Stratum V-a consists of a very dark grayish brown (10YR3/2) silty clay loam. Stratum Vb consists of a dark yellowish brown (10YR4/4) silty clay loam, and Stratum V-c consists of a dark yellowish brown (10YR4/6), somewhat gritty silty clay loam.

Stratum VI

Stratum VI represents the basal alluvial deposits, or subsoil, found in direct contact with bedrock across the site (see Figure 10). Identified as "Stratum C" during the Phase II investigations (Peterson and Pullins 1995), the stratum generally consists of a yellowish brown (10YR5/8) very firm sandy loam.

Figure 13. Site 44LE165, Block B, base of Stratum IV-b, view to the southwest.

CHRONOLOGY

DIAGNOSTIC HAFTED BIFACES

Diagnostic hafted bifaces representing six cultural periods were recovered from 44LE165. The earliest of these is a Hardaway Side-Notched, recovered from Stratum IV-b in Test Unit 30. Oliver (1985) describes the Hardaway Side-Notched as evolutionarily positioned between the Hardaway-Dalton and the Palmer Corner-Notched types, ca. 10,000 to 8000 BC. A Kirk Corner-Notched (Stratum IV-b) and a Kirk Stemmed (plowzone) were also recovered. These are typically associated with the Early Archaic period in Virginia and eastern Tennessee, dating from around 6700 to 7800 BC (Chapman 1977:21, 123–124; Gardner 1974). These three hafted bifaces represent a much earlier period than is suggested by the radiocarbon dates and other diagnostic artifacts at 44LE165, and the examples recovered from 44LE165 represent either an ephemeral, undetected presence, or tools that were either found and used by the later occupants, or that are merely isolated discards from this earlier period.

Some hafted bifaces could only be identified according to a generalized temporal affiliation rather than a specific type name. Often these hafted bifaces exhibit a suite of characteristics belonging to several defined types of the same period, but due to fragmentation could not be definitively assigned to a particular category. In other cases, temporal affiliations are based on negative evidence; for example, if a particular hafted biface exhibits characteristics which are clearly not Woodland or Paleoindian, then it might be inventoried as an "Unidentified Archaic" hafted biface. This is the case with three hafted bifaces at 44LE165 that are described as "Late Archaic Stemmed" hafted bifaces. The Late Archaic period in southwestern Virginia generally dates from somewhere between 3000 and 1000 BC (McLearen 1991; Rappleye and Gardner 1980).

A Brewerton Cluster hafted biface recovered in Stratum IV-b appears to be a side-notched member of the Brewerton cluster referred to by Ritchie as Otter Creek, dating to the Late Archaic period (ca. 3000–1000 BC) (Ritchie 1971:41).

A Savannah River hafted biface was recovered from Stratum IV-a. This common stemmed point typically dates to the Late Archaic period (ca. 3000–1000 BC).

The Otarre Stemmed hafted biface is considered to be the latest point type produced in the southern Appalachians prior to the introduction of ceramics (Keel 1976:196). The Gypsy Stemmed and Swannanoa Stemmed are closely related, and all three are indicative of a period loosely described as the Late Archaic/ Early Woodland Transitional period. Oliver (1985) describes the Gypsy Stemmed as the lineal descendant of the Late Archaic Small Savannah River Stemmed biface. At sites in the North Carolina Blue Ridge, these points have been associated with a Swannanoa phase early ceramic zone (Oliver 1985:205). In some places, Gypsy Stemmed points have been associated with the similar Swannanoa Stemmed points in contexts containing soapstone sherds. Oliver notes that the Swannanoa Stemmed appears to be the lineal decedent of the Gypsy, and suggests that this point represents the terminal expression of stemmed forms in the Piedmont and Blue Ridge provinces (1985:207). Swannanoa, Gypsy, and Otarre hafted bifaces appear to be closely related to one another, and can be generally associated with the transition from preceramic Late Archaic to ceramic-bearing Early Woodland assemblages. Keel provides a suggested date range from around 700 to 200 BC for the Swannanoa Stemmed (1976:241). Otarre hafted bifaces were recovered from every context except features and Stratum IV-b in Test Units 19–30. Gypsy ans Swannanoa hafted bifaces were recovered exclusively in Stratum IV-b, and primarily in Test Units 12 and 14.

Another type of hafted biface was identified in association with the Gypsy and Swannanoa hafted bifaces in Stratum IV-b. Despite consultation with a number of texts and reports in the region (including Virginia, Tennessee, and North Carolina), this hafted biface could not be assigned to a specific type. Similar examples were identified in the Pennington Gap area during recent Phase II archaeological excavations (Peterson and Pullins 1995), but these types were rather uncertainly labeled as “Brewerton/Holston”, even though they could not be definitively assigned to either type. Rather than creating a “provisional type” with limited usefulness, it was decided to formally define a named type and provide a description. This type will be known as the Lonesome Pine, named after the Trail of the Lonesome Pine that passes through the Pennington Gap region. Stratigraphically, it is associated with the Gypsy and Swannanoa point types in Stratum IV-b (primarily in Test Units 19–30), and will therefore be considered to date roughly to the same time as Keel’s Swannanoa Stemmed (ca. 700–200 BC).

Two Middle Woodland hafted bifaces were recovered. A Jack’s Reef Corner-Notched hafted biface was found in Stratum IV-a, and a triangular Connestee hafted biface was recovered from the plowzone. The Jack’s reef generally dates to the latter portions of the Middle Woodland period, prior to AD 900 or so (Ritchie 1976:26); Connestee hafted bifaces typically date from ca. AD 100 to 600 (Keel 1976:219).

Finally, four small triangular hafted bifaces were recovered, all in plowzone contexts. These are characteristic of the Late Woodland period, post-AD 900.

Diagnostic Ceramics

A total of 38 ceramic sherds and one ceramic vessel was identified. The vessel and most of the sherds were found in Feature 7; the remaining sherds are from the plowzone and from Stratum IV-a.

Five ceramic sherds were recovered from plowzone contexts. One of the sand-tempered sherds is a simple-stamped Connestee ware dating from the Middle Woodland period (ca. AD 100–600), and one of the limestone-tempered sherds is a plain Radford series type dating from the Late Woodland period (Keel 1976:219; .Egloff 1990:11). A single limestone-tempered ceramic sherd recovered from Stratum IV-a has an unidentifiable surface treatment that may be textile-impressed; if so, then this sherd also represents a Late Woodland Radford type.

The only ceramic artifacts from feature contexts were found in Feature 7. These include 32 limestone-tempered sherds (two of which are identifiable as cord-marked Radford ware body sherds), and one ceramic vessel, The vessel is at least partially cord-marked, with a smoothed neck and incised, oblique parallel lines on the neck to a point just below the lip. The rim is flat and probably straight, but the overall vessel form will remain uncertain unless the sherds can be stabilized and reassembled. The vessel was examined in the laboratory by Keith Egloff of the Virginia Department of Historic Resources, who was unable to establish a definite type but said that it appeared to be limestone-tempered and “Radford-like.” Traditional Radford ceramic surface treatments are primarily net-impressed, with some cord-marked, scraped, smoothed, plain, corncob-impressed, and (rarely) stamped variations identified as well (Holland 1970, Egloff 1990). Exterior decorations include, among other things, incised decorations on the body with parallel lines or crude oblique, herringbone, or chevron patterns (Holland 1970, Egloff 1990). As will be discussed in the following section, radiocarbon dates returned for Feature 7 are AD 780–1000 and 645–880; Radford ceramics have generally dated to the Late Woodland period, from around

AD 1000 to 1700 in southwestern Virginia (Egloff 1990). If this does represent a Radford vessel, then it is one of the earliest examples of the type. Egloff notes the presence of similar limestone-tempered net-impressed vessels from the Wautaga Reservoir in eastern Tennessee, which have earlier radiocarbon dates of AD 658 ± 152 and AD 680 ± 157 (Riggs 1985 in Egloff 1990:11).

Radiocarbon Dates

Two conventional radiocarbon dates were obtained from Feature 7, a large pit originating in Stratum IV-a and cutting though Stratum IV-b and into Stratum VI (subsoil) (see Figure 10). The first sample was a single large piece of carbonized material (weighing about 52 g in the field) from Layer C, near the base of the feature. The corrected, calibrated date returned at 2 sigma, 95% probability is AD 780–1000 (Beta-115799), with a single intercept of the calibration curve at AD 890 (Appendix E). This dates the feature from the end of the Middle Woodland period to the beginning of the Late Woodland period. A second standard radiocarbon date was obtained from Feature 7 in Layer A, in the upper portion of the feature. The corrected, calibrated date returned at 2 sigma, 95% probability is AD 645–880 (Beta-122524), with a single intercept of the calibration curve at AD 695 (see Appendix E). This second date is consistent with the first, and supports not only the integrity of the feature, but the dating of the feature to near the end of the Middle Woodland period or the beginning of the Late Woodland period.

A sample of eight pieces of carbonized nutshell (thick-walled hickory nut) from Feature 6, a posthole feature identified at the *base* of Stratum IV-b and extending into Stratum VI (subsoil), was subjected to AMS radiocarbon assay. The corrected, calibrated date returned at 2 sigma, 95% probability is 3095 to 2905 BC (Beta-124255), with intercepts of the calibration curve at 3015 BC, 2985 BC, and 2935 BC (see Appendix E). This date roughly corresponds to the beginning of the Late Archaic period.

Two other carbon samples were submitted for radiocarbon dating via the AMS method. Both of these samples were taken from the profile of Trench 4 to assist with the geomorphological analysis. Sample PRO3 is a bulk soil sample with carbonized material taken from a 0.77 to 0.87 m below the ground surface at Profile 3 in Trench 4, corresponding to the buried horizon Stratum IV-b. The corrected, calibrated date returned at 2 sigma, 95% probability is 3325 to 2925 BC (Beta-117247), with a single intercept of the calibration curve at 3085 BC (see Appendix E). This dates carbonized material from this soil stratum roughly to the beginning of the Late Archaic period, and is nearly identical to the date obtained from the postmold at the base of Stratum IV-b.

Sample PRO4 is carbonized material taken from 0.70–0.75 m below the ground surface at Profile 4 in Trench 4. The corrected, calibrated result returned at 2 sigma, 95% probability are AD 1680–1755 and AD 1805–1940 (Beta-117248), with no intercepts of the calibration curve (see Appendix E). This less than definitive set of date ranges was obviously unexpected from this context, which had prehistoric artifacts protruding from the profile. Analysis of these results will be discussed in greater detail in the following section.

Summary

Diagnostic artifacts indicate fairly clearly that the plowzone contains both Middle and Late Woodland components, ca. AD 100–1700. Diagnostic artifacts indicate with similar clarity that there is a component contained within Stratum IV-b that dates from the transition of the Late Archaic into the Early Woodland period. The two radiocarbon dates associated with Stratum IV-a support the idea of the stratum as an initially stable, buried surface (see the geomorphological analysis in Appendix B), but they do not correspond with currently accepted dates for the diagnostic artifacts recovered within the stratum. While it is not surprising to obtain a radiocarbon date earlier than the accepted dates for diagnostic artifacts within the stratum when that date is obtained using charred material from a bulk soil sample from the stratum, it was anticipated (based on the diagnostic artifacts) that the date obtained from nutshell fragments in the postmold would be closer the end of the Late Archaic or beginning of the Early Woodland, ca. 1000 BC. Instead, the material from the post returned a date nearly identical to that of the bulk soil sample—ca. 3000 BC, near the beginning of the Late Archaic. It may be that the postmold contents have been compromised or disturbed in some way such that earlier Stratum IV-b materials have intruded; for example, if the posts were removed and either purposefully or naturally refilled with soil from the stable Stratum IV-b surface. In such a scenario, these two nearly identical radiocarbon dates are associated not with the archaeological material recovered within Stratum IV-b, but with earlier processes related to the development of the Stratum IV-b soil as a stable surface.

Level	Debitage	Hafted Bifaces	Bifaces	Informal Ground Stone	FCR	Misc. Stone	Total
IV-a1	70	0	0	1	7	5	83
IV-a2	53	0	0	0	6	9	68
IV-a3	48	0	0	0	7	9	64
IV-a4	35	0	0	0	6	15	56
IV-a5	62	1	1	0	11	11	86
IV-a6	58	0	0	0	17	13	88
Total	326	1	1	1	54	62	445

Table 2. Site 44LE165, Test Unit 18-NE, Stratum IV-a, artifacts recovered from ¼ inch screen, by 5-cm level.

Stratum IV-a contains chronologically mixed diagnostic artifacts. The Jack's Reef hafted biface and the (possibly Radford) ceramic sherd suggest a Middle and Late Woodland component, but the Savannah River and numerous Otarre hafted bifaces indicate a Late Archaic/Early Woodland transitional presence as well. It may be that some of the Middle/Late Woodland component identified in the plowzone remains unplowed at the top of Stratum IV-a, and this remnant then overlies a terminal Late Archaic/Early Woodland component. More likely, however, this mixing is related to the geomorphological origins of Stratum IV-a. As noted earlier in this chapter, geomorphological analysis conducted by Daniel Hayes (see Appendix B) demonstrated that Stratum IV-a likely resulted from not only flood deposition, but also colluvial redeposition of fine-grained sediment eroded from the adjacent toe slope. Furthermore, close analysis of 5-cm levels of Stratum IV-a in Test Unit 18 (Table 2) did not reveal any vertical patterning of artifacts in the stratum, lending support to the interpretation of Stratum IV-a as a context with reduced archaeological integrity due to mixed depositional and re-depositional processes.

Descriptions of Features

Features identified during data recovery excavations at 44LE165 are presented in Table 3. Features include Late Archaic/Early Woodland Transitional postmolds, a Middle/Late Woodland pit, tree-related stains, and discreet concentrations of unmodified rock.

Late Middle Woodland/Early Late Woodland Features Round Pit (Feature 7)

Feature 7 is a large, basin-shape pit first identified in the north profile of Trench 4 (see Figure 10). The trench exposed the southern edge of the feature in profile (Figure 14). The top of the feature was not clearly defined in this profile, but appeared to originate within the alluvial deposits in Stratum IV-a, with the base of the feature intruding through Stratum IV-b and into Stratum V (Figure 15).

When the plowzone (Strata I and II) and Stratum IV-a were removed from the block with a Gradall to expose Stratum IV-b, some of Stratum IV-a (about 12 cm) was left intact in the vicinity of Feature 7 so that the feature could be exposed in plan but not disturbed by the Gradall. The top outline of the feature was carefully exposed by hand, but the western edge of the feature was very difficult to see at the surface. The heavy concentration of burned wood lining the base of the feature extended to the surface on the eastern edge and, to some extent, on the northern edge of the feature. Difficulties in defining the upper surface of the feature was partially due to the strong similarity between the Stratum A feature fill and the surrounding soil matrix; Stratum IV-a is a dark brown (10YR3/3) clay loam, and the feature fill (Stratum A) is a very dark grayish brown (10YR3/2) clay loam. Furthermore, the upper portion of the feature may have been obscured by the colluvial/alluvial processes associated with the deposition of Stratum IV-a. Mapping and excavation relied initially on observation of feature Stratum C (burned wood) showing at the top edge of the feature to define the feature limits (see Figure 14) , and then refined the feature definition as additional, more visible feature strata were exposed.

The feature measures 1.38 m in diameter, and the total depth is 0.40 m from the top of the feature to the deepest portion of the basin. As shown in Figure 14, the profile exposed in Trench 4 was closer to the south edge of the feature than it was to the center; nevertheless, this profile does illustrate all of the feature strata.

The feature consists of three basic strata, excavated as Strata A, B, and C (see Figure 14). Stratum A is a very dark grayish brown clay loam with light yellowish

Feature	Associated Context	Cultural Affiliation	Function
1	Phase II "Level B_2"	Unknown	Rock deposit
3	Phase II "Level B"	Unknown	Postmold
4	Phase II "Level B"	Non-cultural	Tree root mold
5	Base of plowzone	Modern	Unknown
6	Base of Stratum IV-b	Late Archaic/Early Woodland	Postmold
7	Stratum IV-a	Middle/Late Woodland	Roasting pit?
8	Base of Stratum IV-b	Late Archaic/Early Woodland	Postmold
9	Base of Stratum IV-b	Late Archaic/Early Woodland	Postmold
10	Base of Stratum IV-b	Non-cultural	Tree
11	Base of Stratum IV-b	Non-cultural	Rock deposit
12	Base of Stratum IV-b	Non-cultural	Rock deposit
13	Base of Stratum IV-b	Non-cultural	Rock deposit
14	Not assigned	-	-
15	Base of Stratum IV-b	Late Archaic/Early Woodland	Postmold
16	Base of Stratum IV-b	Late Archaic/Early Woodland	Postmold
17	Base of Stratum IV-b	Late Archaic/Early Woodland	Postmold
18	Stratum IV-b	Late Archaic/Early Woodland	Hearth

Table 3. Site 44PW600, features identified.

brown silty clay inclusions and a light charcoal flecking. Stratum B is a very dark grayish brown clay loam mixed with burned clay or ceramics and heavy charcoal deposits. Stratum C consists entirely of wood charcoal, some in pieces as much as 0.15 m long and 0.10 m thick. The feature fill was very moist throughout, making the charcoal and burned clay/ceramic wet, spongy, and very fragile.

Stratum A is characterized by high densities of debitage and fire-cracked rock relative to other feature strata, and low densities of limestone, ceramics, and charred material. A total of 131 artifacts were recovered from Stratum A, including 88 pieces of debitage, one retouched flake, 32 pieces (2.350 kg) of fire-cracked rock, six pieces (0.234) of limestone, and four pieces (0.395 kg) of miscellaneous/unmodified stone (Table 4). Debitage types are presented in Table 5; raw materials and cortical percentages are shown in Tables 6 and 7. About one-third of the debitage consists of secondary/biface thinning flakes, with flake fragments/shatter comprises almost two-thirds. A few primary/reduction flakes and angular, blocky fragments/chunks were present as well. A total of 48 pieces of debitage (55%) exhibit signs of thermal alteration, all of which are flake fragments/shatter or angular, blocky fragments/chunks. The lithic raw materials represented by the debitage in Stratum A are typical for a Powell Valley assemblage, something that will be discussed in the following chapter. Descriptions of the chert color variation and the procedures used for assigning categories are presented in Chapter 3 with the detailed artifact descriptions. As with many sites in Lee County, the most common identifiable chert is black translucent (26%, n=53), with a few pieces of gray, mottled white, olive green, and oolitic chert also recovered. The remainder of the assemblage is classed as unidentifiable (68%, n=140). In addition, the flotation of six liters of soil from the feature recovered 11 pieces (0.04 g) of wood charcoal, including maple, maple/birch, hickory, American chestnut, flowering dogwood, American holly, and American elm (see Appendix C). Eight pieces of nutshell were recovered as well, including three thick-walled hickory and five walnut shell fragments. A standard radiocarbon date was obtained from nutshell fragments in Stratum A. The corrected, calibrated date returned at 2 sigma, 95% probability is AD 645–880 (Beta-122524), with a single intercept of the calibration curve at AD 695 (see Appendix E)

Stratum B is characterized by a high density of prehistoric ceramic, limestone, and charred material mixed in the soil matrix (see Figure 14). Fire-cracked rock was present, but in lower frequency; the limestone and ceramics represent the most distinctive features of this stratum. Many of the limestone piece are large (averaging over 0.24 kg each) and are roughly positioned in a layer at the base of Stratum B. Most of the ceramics were situated in a crushed position on top of this limestone layer (Figure 16). A total of 228 artifacts were recovered from Stratum B, including 36 pieces of debitage, one Stage 3 biface, one retouched flake, 11 pieces (1.000 kg) of fire-cracked rock, 175 pieces (42.102 kg)

Level	Debitage	Hafted Biface	Unifinished Biface	Informal Tool	FCR	Ceramics	Misc. Limestone	Misc. Stone	Total
A	88	0	0	1	32	31	6	4	162
A flot	77	0	0	0	0	0	0	0	77
B	36	0	1	1	11	1	175	4	229
B flot	101	0	0	0	0	0	0	0	101
C	10	0	0	0	12	1	40	2	65
Cleanup	72	1	0	0	13	0	11	3	100
Total	384	1	1	2	68	33	232	13	734

flot=artifacts recovered during the flotation process; * single vessel in an unknown number of fragments

Table 4. Site 44LE165, Feature 7, artifacts recovered by stratum.

Feature Stratum	Primary/ Reduction	Secondary/ Biface Thinning	Flake Fragment/ Shatter	Angular, Blocky Fragments/Chunks	Total
A	1	21	65	1	88
A flot*	0	3	3	0	6
B	3	15	18	0	36
B flot*	0	1	7	1	9
C	0	2	7	1	10
Cleanup	5	31	36	0	72
Total	9	73	136	3	221

flot=artifacts recovered during the flotation process (includes only debitage > 0.25 in.)

Table 5. Site 44LE165, Feature 7, debitage recovered by stratum.

Feature Stratum	BTC	GC	MWC	OGC	OC	UC	Total
A	24	4	2	0	2	56	88
A flot	0	0	0	0	0	77	77
B	10	0	0	0	0	26	36
B flot	0	0	0	0	0	101	101
C	0	0	0	0	1	9	10
Cleanup	19	0	2	1	1	49	72
Total	53	4	4	1	4	318	384

flot=artifacts recovered during the flotation process

BTC=Black translucent chert MWC=Mottled white chert OC=Oolitic chert

GC=Gray chert OGC=Olive green chert UC=Unidentifiable chert

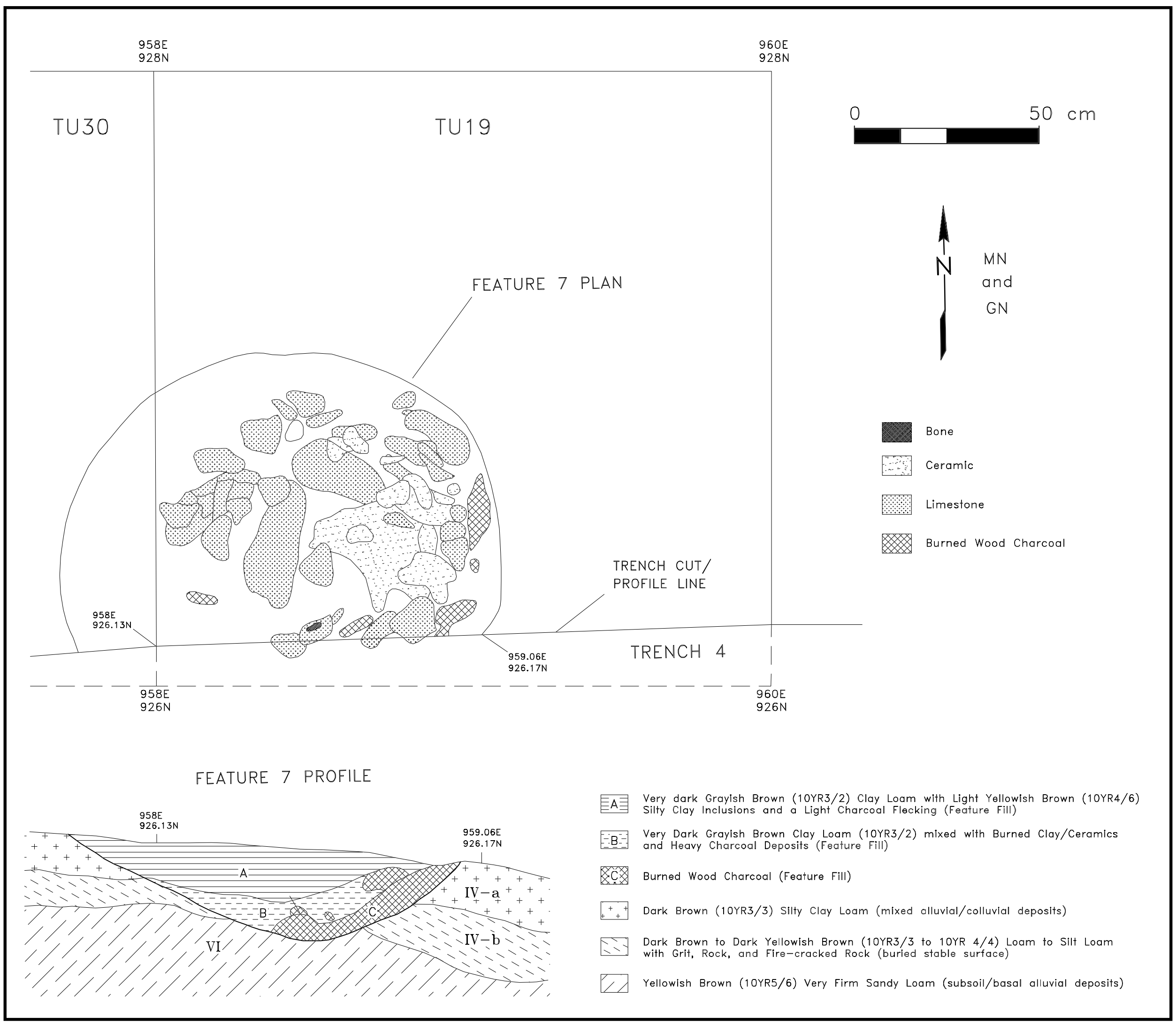
Table 6. Site 44LE165, Feature 7, debitage raw materials recovered from ¼ in. screen, by stratum.

Feature Stratum	Non-cortical	1-74% Cortex	>75% Cortex	Totals
A	50	25	13	88
A flot	2	2	2	6
B	18	12	6	36
B flot	4	6	0	10
C	8	1	1	10
Cleanup	45	19	8	72
Total	127	65	30	222

flot=artifacts recovered during the flotation process (includes only debitage > 0.25 in.)

Table 7. Site 44LE165, Feature 7, debitage percent cortex recovered from ¼ in. screen, by stratum.

Figure 14. Site 44LE165, Feature 7, plan (base of Stratum B) and north profile (top of Stratum A).



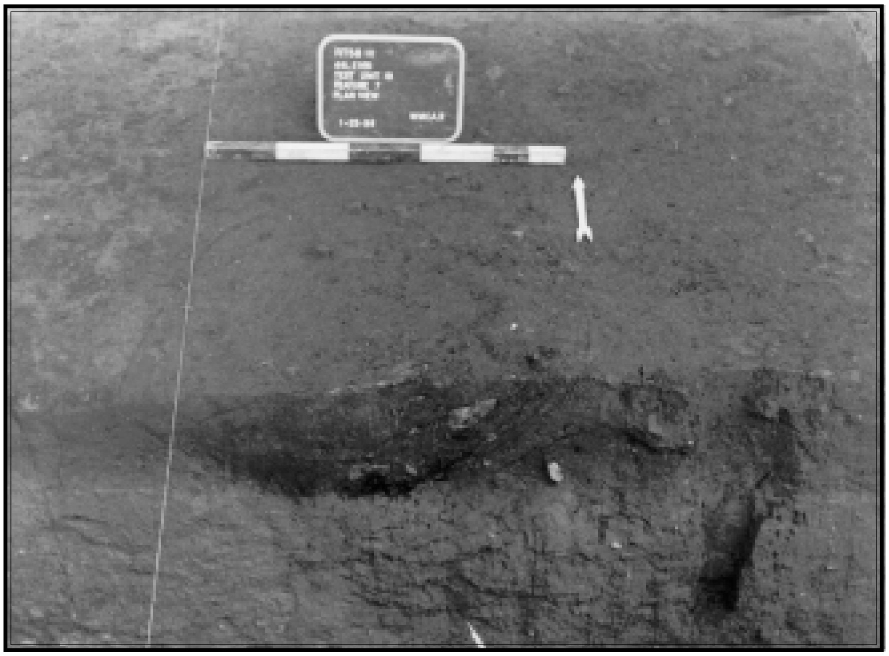


Figure 15. Site 44LE165, Feature 7, profile exposed by the north profile of Trench 4.

Figure 16. Site 44LE165, Feature 7, base of Stratum B, plan view.

of limestone, four pieces (0.196 kg) of miscellaneous/unmodified stone, and one piece of unburned (and unidentifiable) bone. The number of secondary/biface thinning flakes is about the same as in Stratum A, as is the number of primary/reduction flakes, but the frequency of flake fragments/shatter declines sharply. No angular, blocky fragments/chunks were present. A total of 26 pieces of debitage (72%) exhibit signs of thermal alteration; unlike Stratum A, secondary/biface thinning flakes and primary/reduction flakes are well-represented in the assemblage of thermally altered debitage. The lithic raw materials represented by the debitage in Stratum B are all either black translucent chert or unidentified chert. Eighty-three pieces of wood charcoal were recovered from a 6-liter flotation sample; identifiable fragments include hickory, American chestnut, American holly, and white oak. Importantly, five cultigens were recovered from this stratum, all representing fragments of corn (*Zea mays*) (see Appendix C). The corn includes two kernels and three cupule fragments. No nutshell was recovered.

Stratum C consists entirely of wood charcoal and feature fill from the upper strata that has settled into the gaps in the wood. The stratum was excavated by removing the larger chunks of wood, some weighing as much as 56 g, and placing them in a foil-lined plastic box. Mixed soil and wood around the larger chunks was removed and screened, recovering a total of 64 artifacts that include 10 pieces of debitage, 12 pieces (0.425 kg) of fire-cracked rock, 40 small pieces (1.100 kg) of limestone, and two pieces (0.090 kg) of miscellaneous/unmodified stone. Debitage was rarely recovered in this feature stratum; only ten pieces were recovered. All but one piece of debitage exhibit signs of thermal alteration. A total of 1,435 wood charcoal fragments were recovered from a six liter soil sample; 19 identifiable pieces are hickory, and one identifiable piece is white oak (see Appendix C). A total of 53 pieces of hickory nutshell were recovered from this sample as well. In addition, four charred wood fragments were selected from the many large pieces of wood (totaling [] grams in the field) collected from the base of the feature. These four hand-collected samples ranged in weight from 10.91 to 48.89 grams, and included not only hickory, but also white oak, red oak, and American chestnut.

A standard radiocarbon date was obtained from a single piece of burned wood (56 g in the field) from Stratum C. A corrected, calibrated date of AD 780–1000 was obtained at a 2 sigma, 95% probability (Beta-115799), with a single intercept on the calibration curve of AD 890. This late Middle Woodland to early Late Woodland date is consistent with an early form of the Radford-like ceramics recovered in Stratum B, as well as with the radiocarbon date obtained from the nutshell in Stratum A.

Late Archaic/Early Woodland Transitional Features

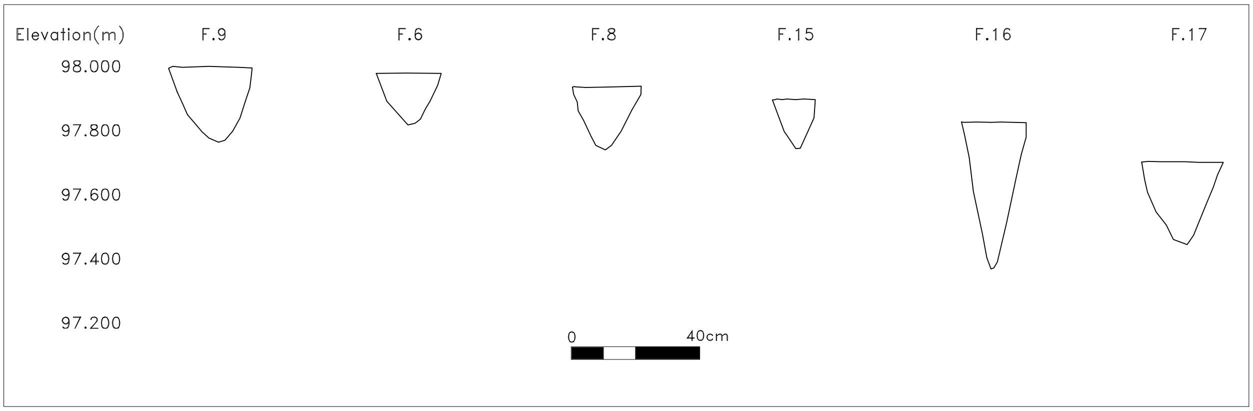
Postmolds (Features 6, 8, 9, 15, 16, and 17)

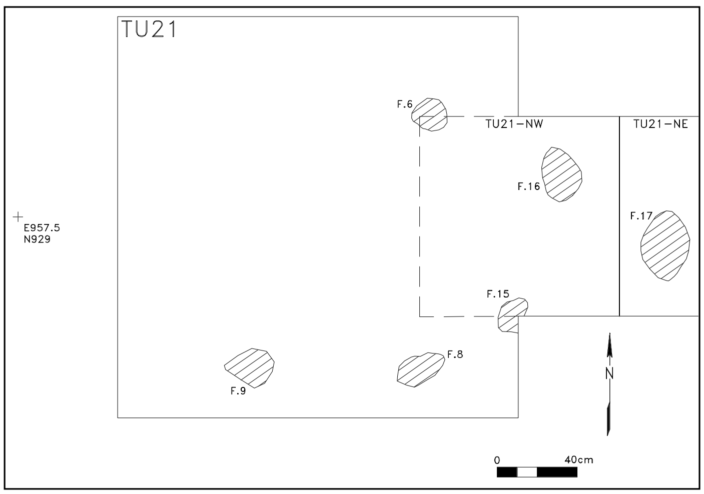
These features are postmolds identified at the base of Stratum IV-b in Test Units 12-NE, 12-NW, and 21 (Figure 17). With the exception of Feature 16, these postmolds extend 0.16 to 0.25 m below the base of Stratum IV-b, and range from 0.13 to 0.25 m in diameter. Feature 16 is a deeper postmold at 0.47 m, but is about the same diameter as the other posts (0.19 m). The eastern half of Feature 6 was excavated and screened through 0.25-in. mesh, with the western half retained for flotation. All soil was retained for flotation in the other five postmolds. Two pieces of debitage were recovered from the eastern half of Feature 6.

Plant materials recovered from Features 6, 8, and 16 during the flotation process were submitted for archaeobotanical analysis (see Appendix C). Two pieces of wood charcoal were recovered from a 2 liter sample in Feature 6; one of these pieces is ash. Eight pieces of thick walled hickory nutshell were also recovered; these nutshell fragments were subsequently submitted for radiocarbon assay, returning a corrected, calibrated date returned at 2 sigma, 95% probability of 3095 to 2905 BC (Beta-124255), with intercepts of the calibration curve at 3015 BC, 2985 BC, and 2935 BC (see Appendix E). This date roughly corresponds to the beginning of the Late Archaic period. As noted in the discussion of radiocarbon dates in the chronology section of this chapter, the date should associated with the development of Stratum IV-b as a stable surface rather than the occupation associated with the artifacts in Stratum IV-b.

A total of 72 pieces of wood charcoal and nutshell was recovered from a four liter flotation sample from Feature 8 (see Appendix C). Identifiable wood charcoal includes American holly and black walnut; nutshell included 53 pieces of thick walled hickory. A total of 85 pieces of wood charcoal and nutshell was recovered from a six liter flotation sample from Feature 16. Identifiable wood charcoal includes hickory, black walnut, eastern red cedar, and white oak; nutshell included 79 pieces of thick walled hickory.

It does not appear that these six postmolds are part of a single, permanent structure. The posts were set vertically in a shallow fashion, about as deep as they are





KEY
Feature 6 - Dark Grayish Brown (10YR4/2) Silty Loam
Feature 8 - Very Dark Grayish Brown (10YR3/2) Silty Loam with Charcoal Flecking
Feature 9 - Very Dark Grayish Brown (10YR3/2) Silty Loam with Charcoal Flecking
Feature 15 - Very Dark Grayish Brown (10YR3/2) Silty Loam with Charcoal Flecking
Feature 16 - Very Dark Grayish Brown (10YR3/2) Silty Loam with Charcoal Flecking
Feature 17 - Very Dark Grayish Brown (10YR3/2) Silty Loam with Charcoal Flecking

Figure 17. Site 44LE165, Features 6, 8, 9, 15, 16, and 17, plan and profile views.

wide. They may have been set as supports for some special-purpose activity, or they may be part of one or two lean-tos; either case points toward a relatively short-term occupation. This idea will be examined in greater detail when artifact patterning in the vicinity of these posts is considered.

Hearth (Feature 18)

This hearth was not identified in the field, but is inferred from the distribution of fire-cracked rock in Stratum IV-b. Since no formal facility could be observed in the field, the size of the hearth is unknown. Examination of the both the weight per unit volume (Figure 18) and the quantity per unit volume (not shown) of fire-cracked rock in Stratum IV-b identified a distinct concentration of fire-cracked rock in Test Unit 30 that will be referred to as Feature 18. The density distribution of miscellaneous/unmodified stone recovered from Stratum IV-b (not including Features 11, 12, and 13) was examined as well (Figure 19). Unmodified stone was found to occur all across the block in much higher densities than the fire-cracked rock, and primarily just off the east edge of the terrace in the vicinity of the strongly sloping Test Unit 22. In the field, it was thought that the fire-cracked rock recovered from Stratum IV-b was derived primarily from three large, dense concentrations of rock identified as Features 11, 12, and 13 (see Figure 9). However, as will be noted in their respective feature descriptions below, Features 11 and 12 actually contain primarily miscellaneous/unmodified stone (n=270) with only one piece of fire-cracked rock (Feature 13 was not excavated). The extensive presence of unmodified rock in Stratum IV-b of Block B suggests that the hearth was probably created from local rock gathered into an informal hearth that has since been somewhat scattered from its original location in the vicinity of Test Unit 30.

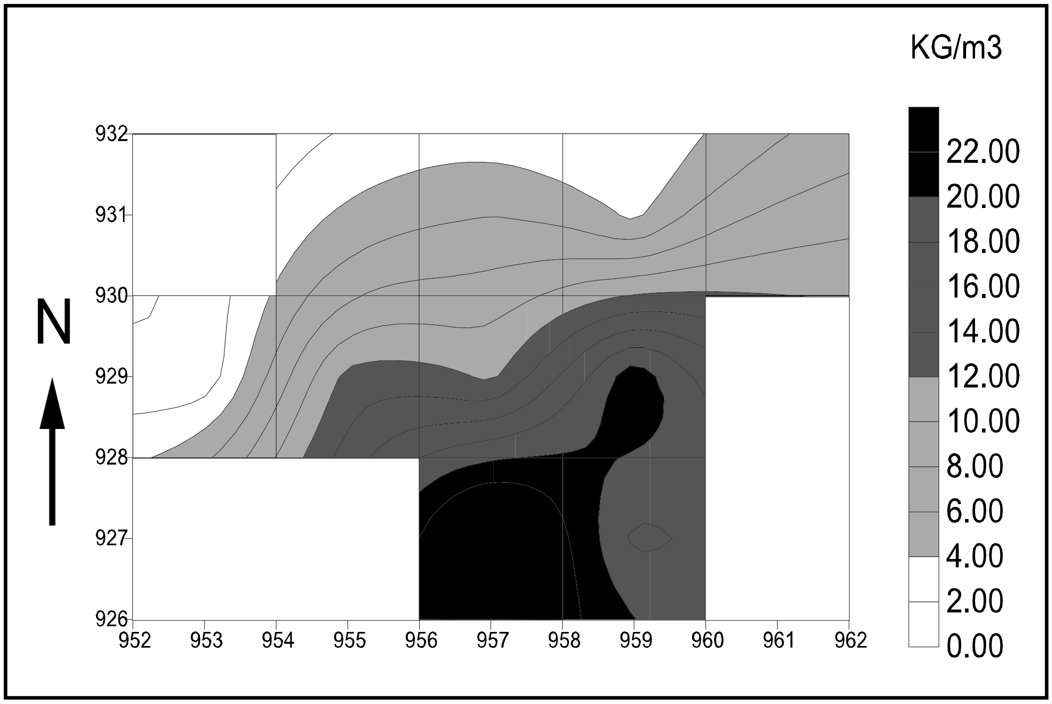


Figure 18. Site 44LE165, Block B, Test Units 19–30, Stratum IV-b, density distribution of fire-cracked rock.

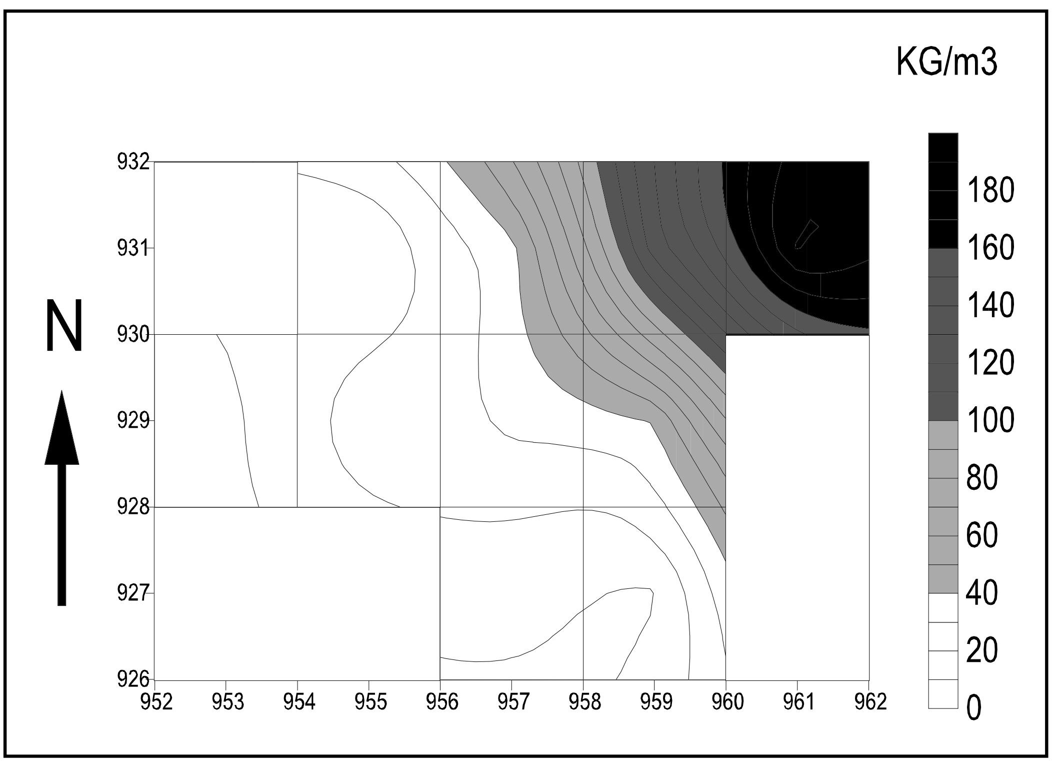


Figure 19. Site 44LE165, Block B, distribution of miscellaneous/unmodified stone per unit volume.

Modern Features

Feature 5

Feature 5 is a linear, flat-bottomed feature identified at the base of the plowzone (Figure 20). The feature measures at least 5.64 m in length, extending from the west wall of Test Unit 10 east into Test Unit 13. The width of the feature is very consistent along its length, generally about 0.20 m but narrowing slightly to the east with a depth of 0.03 to 0.06 m. Feature fill consists of a strong brown (7.5YR5/8) clay with coarse grit and occasional charcoal flecking, mottled with a dark yellowish brown (10YR4/4) clay. The portion of the feature in Test Unit 13 was excavated and screened, recovering five pieces of debitage and a few pieces of modern cinder that were discarded in the field. While the function of the feature is not known, its contents and stratigraphic position suggest a modern origin.

Non-Cultural Features

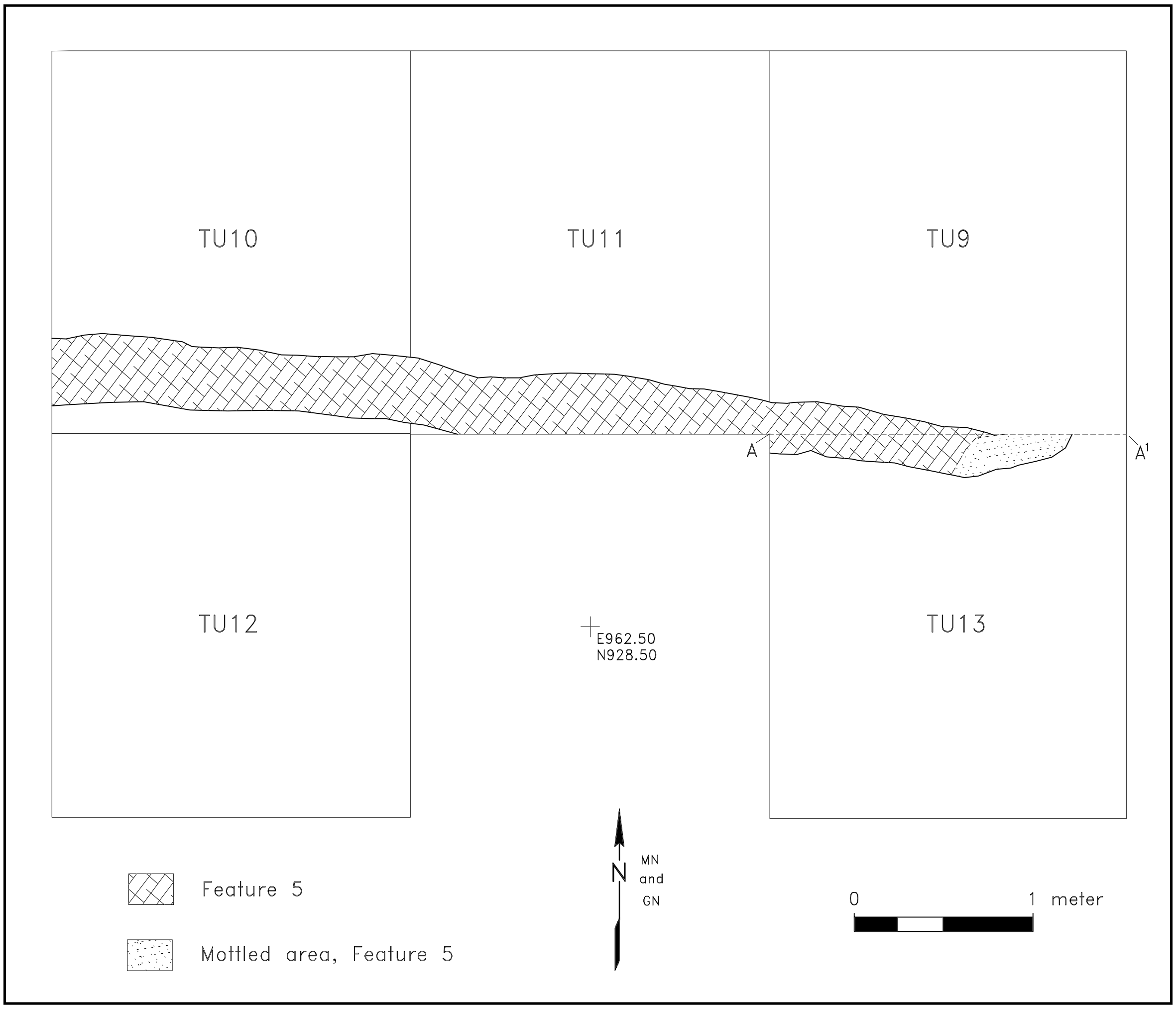
Rock Deposits (Features 1, 11, 12, and 13)

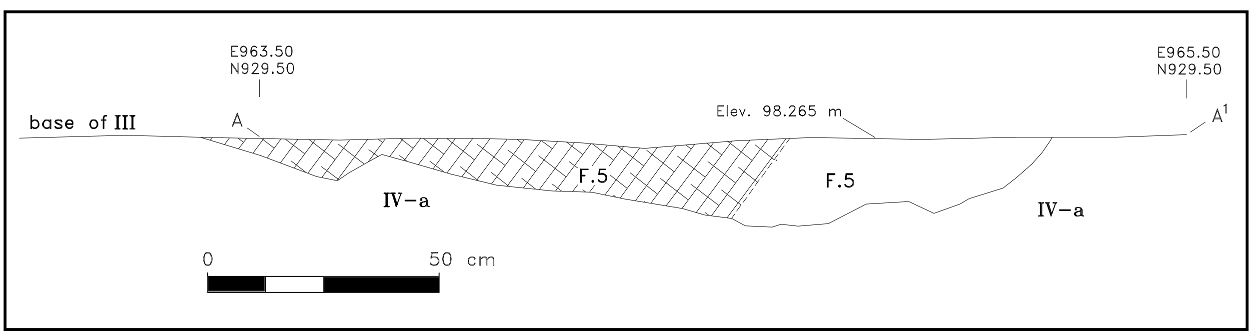
These features represent dense concentrations of stone that is completely contained within Stratum IV-b, and rests on Stratum V (subsoil) at the base of Stratum IV-b. Feature 11 is a linear, dense concentration of rock identified in Test Units 23–26 and Test Unit 30 that measures at least 6 m in length and 1.86 m across. A section 0.50 m in width was excavated in Test Unit 24 that measured up to 0.20 m thick (Figure 21). After examining the rock in the laboratory, it was determined that only one (0.7 kg) of the 144 pieces of rock (20.3 kg) recovered from the feature had been thermally altered, and the feature is likely non-cultural in origin. Twenty artifacts were recovered from Feature 12 in addition to the 143 pieces of miscellaneous/unmodified stone and the one piece of fire-cracked rock, including 18 pieces of debitage, a fragment of a Stage 3 biface, and a core fragment. Only two pieces of debitage (11%) and the biface fragment exhibit any signs of thermal alteration, a lower frequency than one would expect within a hearth or roasting platform (especially when compared to the 72–90% frequency in Strata B and C in Feature 7).

Feature 12 is an oval-shaped concentration of rock identified primarily in Test Unit 26, measuring 0.16 m deep, 1.06 m north-south, and 1.40 m east-west (see Figure 9 and Figure 21). This feature was also exposed in profile by Trench 4 (see Figure 10). Due to its shape and the contents of the feature observed in the field, this feature was originally thought to represent a shallow hearth. After excavating the west half of the feature and examining the rock in the laboratory, it was determined that none of the 127 pieces of rock (17.6 kg) recovered from the feature had been thermally altered, and like Feature 11, the deposit is likely non-cultural in origin. Four artifacts were recovered from Feature 12 in addition to the 127 pieces of miscellaneous/unmodified stone; all four artifacts are pieces of debitage, only one of which exhibits any signs of thermal alteration.

Feature 13 was not tested, but represents a deposit very similar to Features 11 and 12, if a bit more irregular in shape. It was only partially exposed in Test Units 28 and 29 (see Figure 9).

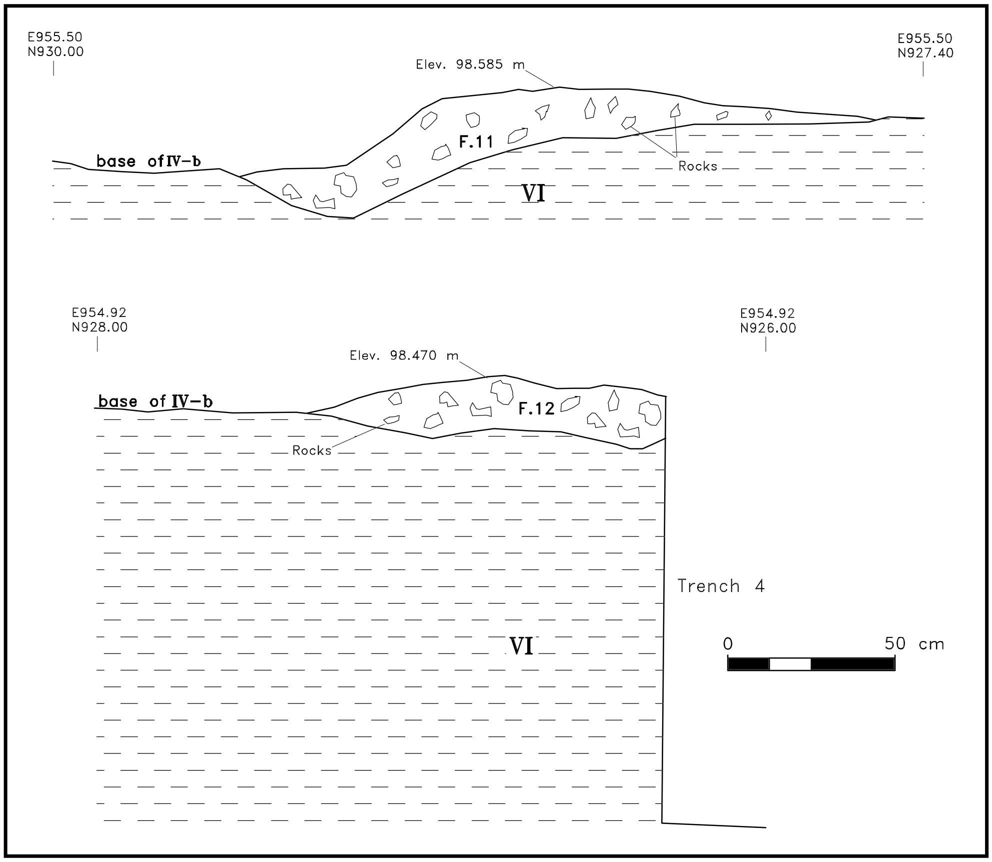
Feature 1 is another rock deposit, identified during the Phase II evaluation of the site (Peterson and Pullins 1995. According to this report, in Test Unit 2 “Level B1...came down upon a concentration of large pebbles and small cobbles at the western end of the unit” (Peterson and Pullins 1995:104). Like Features 11 and 12, the number of artifacts associated with this rock deposit was very low (n=18), and no fire-cracked rock was identified.





KEY
Feature 5 - Strong Brown (7.5 YR5/8) Coarse Gritty Clay mottled with Dark Yellowish Brown (10YR4/4) Clay, with occasional charcoal flecking
Feature 5 (mottled area) - Strong Brown (7.5 YR5/8) Coarse Gritty Clay heavily mottled with Dark Yellowish Brown (10YR4/4) Clay
IV-a - Dark Brown (10YR3/3) Silty Clay Loam

Figure 20. Site 44LE165, Block B, Feature 5, plan and profile.



KEY
Feature 11 - Dark Yellowish Brown (10YR4/4) Clayey Loam with Heavy, Dense Rock
Feature 12 - Dark Yellowish Brown (10YR4/4) Clayey Loam with Heavy, Dense Rock
VI - Yellowish Brown (10YR5/6) Very Firm Sandy Loam (subsoil/basal alluvial deposits)

Figure 21. Site 44LE165, Block B, Features 11 and 12, east profile.

4 Descriptions of Artifacts

INTRODUCTION

The data recovery phase at 44LE165 recovered a total of 20,992 artifacts, including 4,717 pieces of unmodified stone that were also returned to the lab. The complete inventory of artifacts is provided in Appendix A. A summary of major artifact groups (excluding the unmodified stone) includes 14,053 pieces of debitage from both 0.25-in. screen and flotation (86%), 1,699 pieces of fire-cracked rock (10%), 420 flaked stone tools (3%), 59 lithic cores (<1%), 38 ceramic sherds (<1%), five ground stone tools (<1%), and one ceramic vessel comprised of many fragments but, at present, inventoried as a single artifact (Table 8). Distributional analysis of these artifacts is presented in Chapter 3.

In general, artifacts are described according to the usual categories. One exception is the plowzone stratum, where the debitage was not analyzed beyond identifying the artifact as debitage (see Appendix A). The only exceptions to this practice are Strata I/II in Test Units 5 and 6, and Stratum III in Test Units 5–8, which were fully analyzed. This approach was taken not only due to time and budgetary constraints, but also because in-depth analysis of the debitage in plowzone contexts did not appear to effectively contribute to the research questions outlined in Chapter 2. Artifacts described under the “plowzone contexts” headings include Strata I, II, and (if present) Stratum III, as well as artifacts initially piece-plotted as part of Stratum III. Spoil contexts include general spoil from Gradall stripping, and spoil from the discarded plowzone strata in Test Units 7 and 8.

Stratum IV-b is broken in into two contexts. Stratum IV-b in Test Units 12 and 14 was excavated differently than in Test Units 19–30 due to difficulties encountered in understanding the stratigraphy, as explained in the previous chapter. These artifacts in these two contexts will be described separately in this chapter.

Selected tools were submitted to Dr. Richard Yerkes of the Ohio State University for microwear analysis. These results are summarized in this chapter; Dr. Yerkes’s full report appears in Appendix D.

Frequencies given below do not include artifacts recovered from flotation samples or miscellaneous/unidentified stone; these artifact categories are discussed separately under each heading, where appropriate.

ARTIFACT DESCRIPTIONS

Lithic Artifacts

Raw Materials

The Powell Valley lacks well-defined, widely accepted chert type definitions, partially because much of the locally available chert is highly variable in color and composition. Table 9 lists the debitage types and quantities recovered from Phase II excavations at several Lee County sites over the past few years; all of these excavations were conducted by WMCAR, and the lithic analyst was the same for each of these sites. Despite the presence of multiple occupational periods at these sites spanning thousands of years, lithic reduction and tool manufacture utilized locally available chert resources almost exclusively. Color variation in local cherts from black to gray to “unidentified” types in between is typical for most sites in Lee County, including 44LE165. This variation both reflects and describes the general chert resources available in the area, rather than identifying any specific source.

Certain steps were taken in the analysis of lithic materials from 44LE165 to insure consistent results. Due to the range of variation and gradation within the chert assemblage, debitage with slightly different characteristics are often assigned to the same analytical group. Debitage which had a small surface area (< 2 cm on any side) was not assigned to a specific chert category because such detailed sorting procedures would likely be error-prone due to raw material variation.

Several specific groups of systematically recognizable chert types have been identified in Lee County, including black translucent, olive green, white mottled, oolitic, and fossiliferous, all of which represent high quality materials of a specific color or composition. In contrast, gray chert includes a wide degree of color variation in Lee County, ranging from light- and blue-gray

Context	Debitage	Hafted Bifaces	Bifaces	Informal Tools	Other Formal Tools	Cores	FCR	Ceramics	Misc. Stone	Totals
Spoil	5	2	4	0	2	0	0	0	0	13
Str. I–III (Pz)	4512	17	59	81	7	17	270	5	68	5036
Str. IV-a	2457	7	26	22	2	6	144	1	132	2797
Str. IV-b (TU 12, 14)	2594	16	42	22	9	8	362	0	385	3438
Str. IV-b (TU 19–30)	3096	30	45	23	3	27	854	0	3617	7695
Flot. (TU 19–30)	723	0	1	0	0	0	0	0	0	724
Features	235	1	2	2	0	1	69	33	515	858
Feature Flot.	431	0	0	0	0	0	0	0	0	431
Totals	14053	73	179	150	23	59	1699	39	4717	20992

Flot=Flotation; Pz=Plowzone; TU=Test Unit; Str.=Stratum

Table 8. Site 44LE165, artifact types recovered by general context.

Raw Material	44LE237	44LE159	44LE152	44LE165	44LE230	44LE24	44LE166	44LE149	44LE158
Unid chert	1926	239	171	628	761	284	140	187	349
Black Translucent Chert	180	875	621	1606	860	793	453	713	938
Gray chert	253	789	132	458	76	627	73	333	564
Olive green chert	11	3	0	0	1	0	1	0	0
Oolitic chert	5	0	1	0	8	0	1	0	0
Fossiliferous chert	0	0	0	1	0	0	0	0	1
Mottled white chert	57	0	1	1	0	42	0	1	0
Banded chert	27	0	0	0	0	0	0	0	0
Black opaque chert	0	16	0	3	0	2	0	9	8
Chalcedony	5	0	0	0	0	0	0	0	0
Jasper	2	0	0	0	1	0	0	0	0
Metavolcanic	1	0	0	0	0	0	0	0	0
Vitric tuff	0	0	1	0	0	0	0	0	0
Porphorytic rhyolite	0	0	0	0	0	0	0	0	0
Quartzite	1	0	1	0	0	6	0	1	1
Quartz	0	0	3	2	0	5	1	1	1
Limestone	0	1	0	1	3	6	0	3	0
Total	2512	1967	975	2744	1754*	1809	713	1292	1906

* shovel test contexts not included

Table 9. Selected Sites in Lee County, Virginia, raw materials recovered from Phase II shovel test and test unit contexts.

to grayish brown. Many of these materials are mottled or banded, and opaque and translucent areas often occur on the same artifact. Fossil inclusions are also common both in bands and in patches. Despite differences in color and composition, all of the traits present were observed grading into one another.

Similarly, the unidentified chert category contains a extensive range of materials which either did not fit into a specific color/composition category or were too small for a definitive assignation. No specific color parameters have been established for this category. Browns are often present, as well as examples that are "Jasper-like" in appearance, gray-green opaque, or opaque dark green and black chert with red bands which may be related to the olive green category. Debitage which has lost its original appearance due to thermal alteration is also included in the unidentified group. This last point is particularly notable at 44LE165, as will noted elsewhere in this chapter.

There is a strong correlation observed between identifiable cherts and a lack of evidence for thermal alteration in tools and cores at 44LE165. None of the black translucent chert cores, hafted bifaces, unfinished bifaces, endscrapers, or informal tools have been thermally altered, while all of those tools that have been thermally altered can be identified only as unidentified chert (except for one heat-altered jasper hafted biface). While this relationship between chert color classification and thermal alteration assemblage may seem an intuitive observation, it is important to be explicit, since such an observation may affect the effectiveness of the distinction between unidentified cherts in general and black translucent chert in Lee County. Also, if there is a correlation between unidentified chert and thermal alteration, then the relatively low frequency of unidentified chert in the plowzone (75%) in comparison to Stratum IV-a (93%), Stratum IV-b in Test Units 12 and 14 (92%), and Stratum IV-b in Test Units 19–30 (91%) suggests that thermal alteration was a less common practice in the Middle and Late Woodland periods, when more expedient tools were prevalent.

Raw material type was identified for 12,267 artifacts. Chert is by far the most commonly utilized material (98%, n=11,972), followed not so closely by quartzite (n=27). Less than 10 examples each were recovered for chalcedony, jasper, porphyritic rhyolite, hematite, greenstone, sandstone, ferruginous sandstone, dolomite, and unidentified materials. A total of 242 pieces of limestone were recovered as well, mostly (96%, n=232) from Feature 7.

Chert types recovered are mostly subsumed under the broad category of unidentified chert (88%, n=10,538), followed by black translucent chert (11%, n=1298). Other cherts together comprise only 1% of the chert assemblage, and include olive green chert (n=37), fossiliferous chert (n=34), gray chert (n=33), oolitic chert (n=15), mottled white chert (n=14), and banded chert (n=3). This chert assemblage reflects the strongly localized nature of lithic procurement, and is rather typical of Lee County in general (see Table 9).

Feature Contexts

Raw material types were identified for prehistoric artifacts recovered from Features 5, 6, 7, 8, 9, 11, 12, 15, 16, and 17; feature fill from Features 8, 9, and 15–17 was not screened in the field, but retained as a soil sample and subjected to the flotation process in the lab. Feature 5 is comprised entirely of debitage from unidentified chert. The screening process recovered one piece of unidentified chert and one piece of black translucent chert from the east half of Feature 6; flotation of the west half (3 liters) recovered 10 additional flakes classified as unidentified chert, primarily due to their very small size. The same is true for Features 8, 9, 15, 16, and 17, where all of the feature fill was floted, and the only artifacts recovered are debitage from unidentified chert.

The debitage assemblage in Feature 7 represents a wide variety of chert types, including unidentified chert (68%, n=140), black translucent chert (26%), gray, mottled white, and oolitic cherts (each at 2%, n=4), and one piece of olive green chert. Tools were made from black translucent chert (n=1) and unidentified chert (n=2). Features 11 and 12, defined as non-cultural features, nevertheless contained a few prehistoric artifacts. Debitage in Feature 11 is mostly black translucent chert (67%, n=18), with unidentified chert (n=4) and gray chert (n=2). Tools were made from black translucent chert (n=1) and unidentified chert (n=1). Debitage in Feature 12 was split evenly between black translucent (n=2) and unidentified cherts (n=2).

Plowzone Contexts

The plowzone itself is designated as Stratum II; Stratum I (humus) and Stratum III (historically disturbed) are included in this context for analytical purposes, as are piece plots associated with Stratum III. Raw material types were assigned for debitage from these contexts as follows: Strata I–II in Test Units 5 and 6 only, and Stratum III in Test Units 5–8 only (Table 10).

Most of the debitage in these plowzone contexts are unidentified chert (75%, n=1475) (Table 11). Other debitage raw materials include black translucent chert (23%, n=448), as well as olive green, fossiliferous, gray, oolitic, and mottled white cherts. The plowzone in the 2-×-2-m Test Unit 5 accounts for half of all of the olive green chert debitage recovered during the data recovery phase (50%, n=17); in fact, plowzone contexts in general account for 79% (n=27) of the olive green chert debitage. Similarly, fossiliferous chert (47%), gray chert (26%), mottled white chert (21%), and oolitic chert debitage (45%) all have disproportionate frequencies in plowzone contexts relative to the excavated volume represented by these contexts.

Stratum IV-a (Test Units 10, 12, 13, 14, and 18)

Stratum IV-a was excavated and screened in only in the 1-×-2-m north halves of Test Units 12, 13, 14, and in the 1-×-1-m northeast quarter of Test Unit 18. Level IV-a was excavated in 0.05 m levels in Test Unit 18 to observe the distribution of artifacts within the level. Test Unit 10 includes only a portion of the southwest quarter, including associated piece plots (Table 12).

Most of the debitage in these contexts are unidentified chert (93%, n=2282) (see Table 11). Other debitage raw materials include black translucent chert (6%, n=149), as well as quartzite, mottled white chert, olive green chert, fossiliferous chert, jasper, and chalcedony. Half the quartzite debitage recovered during the data recovery phase was found in this stratum (50%, n=13). The frequency of unidentified chert is notably higher than in the plowzone contexts, a pattern that holds true for deeper strata as well.

Stratum IV-b (Test Units 12 and 14)

As discussed in the previous chapter, Stratum IV-b in Test Units 12 and 14 includes slightly different contexts than in Test Units 19–30, and is therefore considered separately. These contexts include Strata IV-b and IV-e in the 1-×-2-m north halves of Test Units 12 and 14 (Table 13).

The debitage in these contexts is primarily unidentified chert (92%, n=2385), about the same frequency as Stratum IV-a (see Table 11). Other debitage raw materials include black translucent chert (7%, n=189), as well as a more limited range of raw materials that include fossiliferous chert, quartzite, and mottled white chert debitage.

Stratum IV-b (Test Units 19–30)

Stratum IV-b was excavated and screened in 0.10 m levels in all Test Units 19–30 except Test Units 26 and 27, which were excavated and discarded (Table 14). The volume of Test Unit 19 is also decreased by the presence of the very large (about 1.0 m diameter) Feature 7.

Nearly all of the chert debitage is unidentified chert (91%, n=2820), with some black translucent chert (8%, n=254) and a few flakes of other raw materials such as gray chert, quartzite, olive green chert, oolitic chert, jasper, and porphyritic rhyolite (see Table 11).

Both bifaces and hafted bifaces tended to be classed as unidentified cherts, perhaps due to their relatively high frequency of thermal alteration. Rarely heated informal tools are primarily designated as black translucent chert (Table 15). Similarly, both of the thermally altered endscrapers are unidentified chert, while the unheated hafted endscraper is black translucent chert. Only four tools are made from raw materials other than black translucent chert or unidentified chert, including two gray chert hafted bifaces, one gray chert unfinished biface, one gray chert retouched flake, and one unfinished biface (in two pieces) made from limestone. Cores are fairly evenly divided between unidentified and black translucent cherts.

Hafted Bifaces

A total of 73 hafted bifaces and biface fragments were recovered (see Table 8). The diagnostic hafted bifaces represent at least six different components, including Late Woodland, Middle Woodland, Late Archaic/Early Woodland Transitional, Late Archaic, Early Archaic, and Paleoindian (Table 16; Figures 22–24).

Microwear Results

Fifteen hafted bifaces were submitted to Dr. Richard Yerkes of the Ohio State University for microwear analysis (see Appendix D). Four of these tools were recovered from Stratum IV-b in Test Units 19–30, six were recovered from Stratum IV-b in Test Unit 14, three were recovered from Stratum IV-a in Test Units 13 and 14, and two were recovered from plowzone (Stratum I/II) contexts in Test Units 5 and 6 . Only one (7%) of these tools, an Otarre hafted biface from Stratum IV-b in Test Unit 14, exhibits use wear traces. Other possible functions described below are based on the types of damage and breaks observed on the biface.

The hafted bifaces recovered from Stratum IV-b in Test Units 19–30 represent two Lonesome Pine hafted

Test Unit/ Level	Debitage	Hafted Bifaces	Bifaces	Informal Tools	Other Formal Tools	Cores	FCR	Ceramics	Misc. Stone	Total
5/I–III	779	8	10	7	4	6	14	1	2	831
6/I-III	967	2	10	14	2	5	50	1	18	1069
7/III	193	0	4	3	0	0	28	0	6	234
8/III	40	1	0	0	0	0	2	0	9	52
9SE/I–III	268	1	3	6	1	1	12	1	2	295
10SE/I–III	245	1	2	11	0	1	6	0	1	267
11SE/I–III	373	1	3	4	0	0	48	1	15	445
12SE/I–III	359	1	3	12	0	1	19	0	2	397
13SE/I–III	344	0	2	5	0	1	31	0	0	383
14SE/I–III	330	0	7	4	0	1	16	0	0	358
15SE/I–III	302	2	6	6	0	0	23	1	6	346
16SE/I–III	291	0	7	7	0	1	21	0	6	333
17SE/I–III	23	0	2	2	0	0	0	0	1	28
Total	4514	17	59	81	7	17	270	5	68	5038

Table 10. Site 44LE165, artifact types recovered from plowzone contexts (Strata I, II, III, and associated piece plots).

Context	UC	BTC	GC	OGC	OC	FC	MWC	CH	JS	PR	QT	Total
Spoil	2	2	1	0	0	0	0	0	0	0	0	5
Plowzone*	1475	448	5	27	5	14	3	0	0	0	2	1979
Str. IV-a	2282	149	0	2	0	2	6	1	2	0	13	2457
Str. IV-b (TU 12, 14)	2385	189	0	0	0	14	1	0	0	0	5	2594
Stratum IV-b (TU 19–30)	2820	254	7	4	2	0	0	0	2	1	6	3096
Stratum IV-b Flotation** (TU 19–30)	723	0	0	0	0	0	0	0	0	0	0	723
Features	152	68	6	1	4	0	4	0	0	0	0	235
Feature Flotation***	431	0	0	0	0	0	0	0	0	0	0	431
Total	10270	1110	19	34	11	30	14	1	4	1	26	11520

* 1,979 pieces of debitage analyzed; remaining 2,535 not analyzed

** 34 pieces of debitage >0.25 in. analyzed; remaining 689 pieces <0.25 in. and categorized as unidentified chert by default

*** 52 pieces of debitage >0.25 in. analyzed; remaining 379 pieces <0.25 in. and categorized as unidentified chert by default

UC=Unidentified chert
BTC=Black translucent chert
GC=Gray chert
OGC=Olive green chert
OC=Oolitic chert
FC=Fossiliferous chert
MWC=Mottled white chert
CH=Chalcedony
JS=Jasper
PR=Porphorytic rhyolite
QT=Quartzite

Table 11. Site 44LE165, debitage raw material by general context.

Test Unit/ Level	Debitage	Hafted Bifaces	Bifaces	Informal Tools	Other Formal Tools	Cores	FCR	Ceramics	Misc. Stone	Total
10 SW/IV-a*	87	0	2	0	0	0	12	0	7	108
12 NE/IV-a	265	0	3	4	1	0	26	1	24	324
12 NW/IV-a	313	0	3	4	0	0	4	0	2	326
13 NE/IV-a	194	1	3	1	0	0	1	0	1	201
13 NW/IV-a	286	1	1	3	0	1	5	0	3	300
14 NE/IV-a	588	4	9	7	1	3	27	0	28	667
14 NW/IV-a	398	0	4	2	0	2	15	0	5	426
18 NE/IV-a	326	1	1	1	0	0	54	0	62	445
Total	2457	7	26	22	2	6	144	1	132	2797

* only partially excavated

Table 12. Site 44LE165, artifact types recovered from Stratum IV-a, including associated piece plots.

Test Unit/ Level	Debitage	Hafted Bifaces	Bifaces	Informal Tools	Other Formal Tools	Cores	FCR	Ceramics	Misc. Stone	Total
12 NE/IV-b*	710	6	14	3	1	3	97	0	75	909
12 NW/IV-b*	299	1	2	2	3	2	78	0	60	447
14 NE/IV-b*	458	3	6	10	1	0	89	0	94	661
14 NW/IV-b	1127	6	20	7	4	3	98	0	156	1421
Total	2594	16	42	22	9	8	362	0	385	3438

* includes Level IV-e

Table 13. Site 44LE165, Test Units 12 and 14, artifact types recovered from Stratum IV-b.

Level	Debitage	Hafted Bifaces	Bifaces	Informal Tools	Other Formal Tools	Cores	FCR	Misc. Stone	Total
IV-b1	1944	20	36	13	2	15	635	1865	4530
IV-b2	941	9	7	5	1	10	152	1311	2436
IV-b3	195	1	2	4	0	2	66	410	680
IV-b4	16	0	0	1	0	0	1	31	49
Total	3096	30	45	23	3	27	854	3617	7695

Table 14. Site 44LE165, Block B, Test Units 19-30, Stratum IV-b, artifacts recovered from ¼ in. screen.

Raw Material	Debitage	Hafted Bifaces	Bifaces	Informal Tools	Other Formal Tools	Cores	Total
Unidentified Chert	2820	19	27	8	2	11	2887
Black Translucent Chert	254	7	15	14	1	16	307
Gray Chert	7	2	1	1	0	0	11
Olive Green Chert	4	0	0	0	0	0	4
Oolitic Chert	2	0	0	0	0	0	2
Fossiliferous Chert	0	1	0	0	0	0	1
Jasper	2	1	0	0	0	0	3
Porphorytic Rhyolite	1	0	0	0	0	0	1
Quartzite	6	0	0	0	0	0	6
Limestone	0	0	2	0	0	0	2
Total	3096	30	45	23	3	27	3224

Table 15. Site 44LE165, Block B, Stratum IV-b, artifact types by raw material (not including fire-cracked rock or miscellaneous/unidentified stone).

Context	ST	C	JR	SR	O	BC	G	S	LP	LAS	AS	KCN	KS	H	UN	Totals
Spoil	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	2
Plowzone	4	1	0	0	2	0	0	0	0	0	0	0	1	0	9	17
Stratum IV-a (TU 12,14)	0	0	1	1	2	0	1	0	0	0	0	0	0	0	2	7
Stratum IV-b (TU 19–30)	0	0	0	0	3	1	3	2	1	0	0	0	0	0	6	16
Stratum IV-b	0	0	0	0	0	0	1	1	3	3	1	1	0	1	19	30
Features	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Totals	4	1	1	1	8	1	5	3	4	3	1	1	1	1	38	73

ST=Small Triangular
C=Connestee
JR=Jack's Reef
SR=Savannah River
O=Otarre
BC=Brewerton Cluster
G=Gypsy Stemmed
S=Swannanoa
LP=Lonesome Pine
LAS=Late Archaic Stemmed
AS=Archaic Stemmed
KCN=Kirk Corner-notched
KS=Kirk Stemmed
H=Hardaway
UN=Unidentified

Table 16. Site 44LE165, diagnostic hafted bifaces by general context.

bifaces, one unidentified Archaic stemmed hafted biface, and one unidentified Late Archaic stemmed hafted biface. All four of these hafted bifaces were used as projectile points. One Lonesome Pine hafted biface (Test Unit 19) exhibits impact damage; the other Lonesome Pine (Test Unit 23) and the unidentified Late Archaic hafted biface (Test Unit 21) exhibit impact damage, but have also been resharpened. The unidentified Archaic hafted biface (Test Unit 21) shows some possible hafting traces and some unidentified wear traces; Yerkes suggests that it may have been used as a projectile point (see Appendix D).

Hafted bifaces from Stratum IV-b of Test Unit 14 submitted for analysis include two Gypsy Stemmed, two Otarre, one Brewerton Cluster, and one Swannanoa. One of the Gypsy Stemmed hafted bifaces is unused; the other is a projectile point that has been damaged during use and resharpened. One of the Otarre hafted bifaces as been damaged and resharpened as well, but it also exhibits microwear associated with fresh hide or meat, as well as some bone/antler traces (Item # 30, Appendix D); Yerkes concludes that it may be either a projectile point or a bifacial knife. The other Otarre exhibits impact damage and hafting traces from its use as a projectile point. The Brewerton Cluster and Swannanoa hafted bifaces both exhibit impact fractures from use as a projectile point.

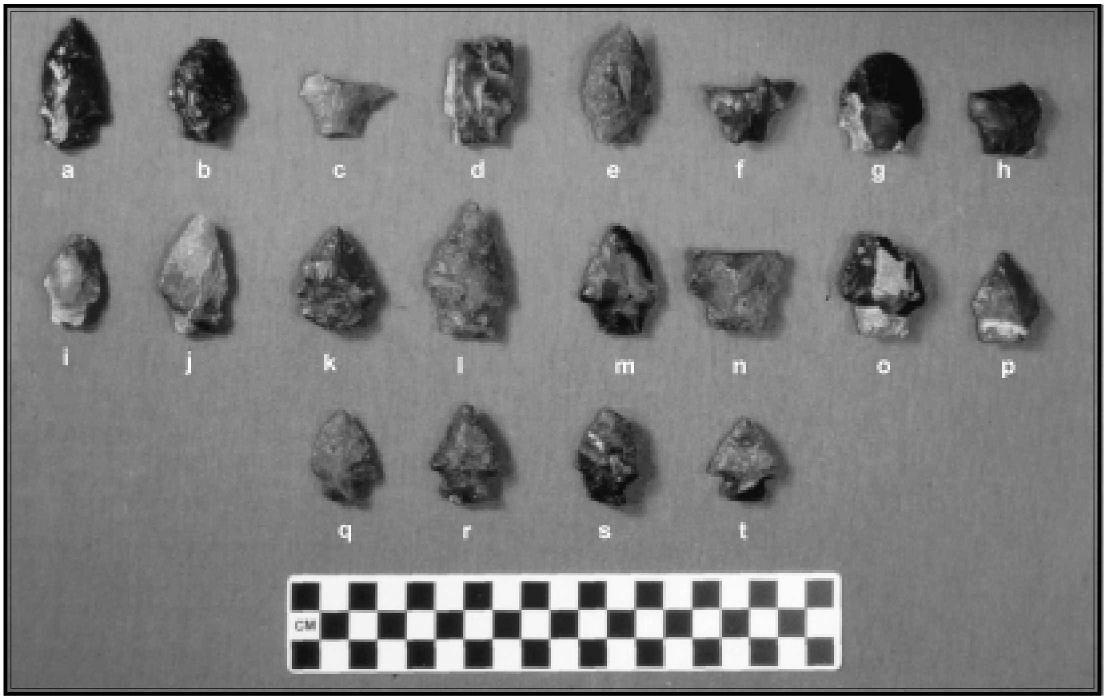


Figure 22. Site 44LE165, Late Archaic/Early Woodland Transitional period hafted bifaces (a - Otarre [General Spoil]; b - Otarre [TU 10 SE L. I/II/III]; c - Otarre [TU 12 SE L. I/II/III]; d - Otarre [TU 14 NE L. IV-a]; e - Otarre [TU 14 NE L. IV-a]; f - Otarre [TU 14 NW L. IV-b]; g - Otarre [TU 14 NE L. IV-b]; h - Otarre [TU 14 NE L. IV-b]; i - Swannanoa [TU 14 NW L. IV-b]; j -Swannanoa [TU 29 L. IV-b1]; k - Swannanoa [TU 12 NE L. IV-e]; l - Gypsy Stemmed [TU 14 NW L. IV-b]; m - Gypsy Stemmed [TU 14 NW L. IV-b]; n - Gypsy Stemmed [TU 19 L. IV-b1]; o - Gypsy Stemmed [TU 12 NE L. IV-b]; p - Gypsy Stemmed [TU 14 NE L. IV-a]; q -Lonesome Pine [TU 12 NE L. IV-b]; r -Lonesome Pine [TU 19 L. IV-b1]; s -Lonesome Pine [TU 22 L. IV-b2]; t -Lonesome Pine [TU 23 L. IV-b2]).

Two of the hafted bifaces from Stratum IV-a in Test Units 13 and 14 are Otarre hafted bifaces, and the other is a Jack's Reef Corner-Notched hafted biface. One of the Otarre hafted bifaces is unused and apparently unfinished; the other exhibit impact fractures from use as a projectile point. The Jack's Reef hafted biface exhibits damage along it (dorsal) left barb, which has been reworked along the margins where it had broken off; it may represent a damaged projectile point that has been resharpened.

The Connestee triangular hafted biface recovered from the plowzone in Test Unit 6 exhibits hafting traces near the base and flute-like impact fractures in from the distal end, suggesting that the point may have been used as a hafted projectile. Another small triangular hafted biface, from the plowzone in Test Unit 5, exhibits a burin-like fracture that may have occurred during the use of the biface as a projectile point, or it may have been caused when the tip of the right barb was being retouched.

Description of Hafted Bifaces

Spoil Contexts. Two hafted bifaces, one complete and one a distal fragment, were recovered from the general spoil context. The complete hafted biface is an Otarre from Late Archaic/Early Woodland period, and the distal fragment is unidentifiable. Both are made from black translucent chert, and neither exhibit signs of thermal alteration.

Feature Contexts. The only hafted biface recovered from a feature context is a fragment of an unidentified type recovered during the cleanup of Feature 7 (Table 17). It exhibits signs of thermal alteration.

Plowzone Contexts. Seventeen hafted bifaces and biface fragments were recovered from plowzone contexts, accounting for 10% of the tool assemblage in this context (see Table 16). While just over half are unidentifiable (n=9), eight could be assigned to at least a general type. All four of the small triangular cluster hafted bifaces (probably Late Woodland) recovered from the site

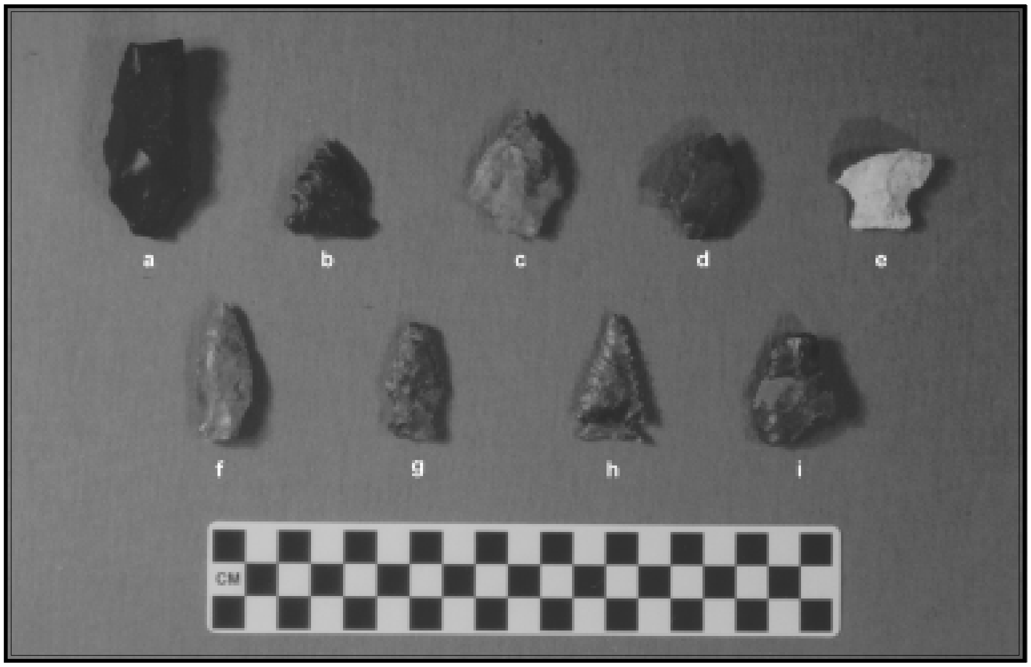


Figure 23. Site 44LE165, other Archaic period hafted bifaces (a - Savannah River [TU 18 NE L. IV-a5]; b - Brewerton Cluster [TU 14 NE L. IV-b]; c -Late Archaic Stemmed [TU 21 L. IV-b1]; d - Late Archaic Stemmed [TU 21 L. IV-b1]; e - Late Archaic Stemmed [TU 29 L. IV-b1]; f - Archaic Stemmed [TU 21 L. IV-b2]; g - Kirk Stemmed [TU 5 L. I/II]; h - Kirk Corner-notched [TU 21 L. IV-b1]; i - Hardaway Side-notched [TU 30 L. IV-b2])

Figure 24. Site 44LE165, Middle/Late Woodland period hafted bifaces (a -Small Triangular Cluster [TU 5 L. I/II]; b -Small Triangular Cluster [TU 5 L. I/II]; c - Small Triangular Cluster [TU 5 L. I/II]; d -Small Triangular Cluster [TU 5 L. I/ II]; e -Connestee [TU 6 L. I/II]; f -Jack's Reef [TU 13 NE L. IV-a])

Feature	Debitage	Hafted	Bifaces Bifaces	Informal Tools	Cores	FCR	Misc. Limestone	Ceramics	Misc. Stone	Total
5	5	0	0	0	0	0	0	0	0	5
6-E	2	0	0	0	0	0	0	0	0	2
6 flot	10	0	0	0	0	0	0	0	0	10
7	206	1	1	2	0	68	232	33	13	556
7 flot	178	0	0	0	0	0	0	0	0	178
8 flot	71	0	0	0	0	0	0	0	0	71
9 flot	37	0	0	0	0	0	0	0	0	37
11	18	0	1	0	1	1	0	0	143	164
12-W	4	0	0	0	0	0	0	0	127	131
15 flot	13	0	0	0	0	0	0	0	0	13
16 flot	34	0	0	0	0	0	0	0	0	34
17 flot	88	0	0	0	0	0	0	0	0	88
Total	666	1	2	2	1	69	232	33	283	1289

flot   artifacts recovered during the flotation process

Table 17. Site 44LE165, artifact types recovered from features.

were found in the plowzone, as was the only Connestee triangular hafted biface, which dates from the Middle woodland period. All of these triangular hafted bifaces are made from black translucent chert, and none exhibit signs of thermal alteration. Seven of the nine unidentifiable fragment have been heated.

Two Otarre hafted bifaces (dating from Late Archaic/Early Woodland period) were also recovered in the plowzone. One is thermally altered, unidentified chert, and one is made from gray chert. An Early Archaic Kirk Stemmed point was recovered as well, made from olive green chert and not thermally altered. Overall, 47% (n=8) of the hafted bifaces, primarily unidentifiable fragments (n=7) and all made from unidentified chert, have been thermally altered. Other, unheated hafted bifaces are made from a variety of materials that includes black translucent chert (29%, n=5), olive green chert, gray chert. and banded chert.

Stratum IV-a (Test Units 10, 12, 13, 14, and 18). Only seven hafted bifaces and biface fragments were recovered, comprising 12% of the tool assemblage in this context (see Table 16). The five diagnostic points generally describe an assemblage dating from the latter portion of the Late Archaic into the Middle Woodland, and include a Jack's Reef (Middle Woodland), a Savannah River (Late Archaic), two Otarre (Late Archaic/Early Woodland), and one Gypsy (Late Archaic/Early Woodland). The remaining two hafted bifaces are unidentifiable fragments. All three Otarre points, the Savannah River, and one of the unidentified fragments are made from an unidentified chert, with the Jack's Reef and the other hafted biface fragment made from black translucent chert. The Middle Woodland Jack's Reef and the hafted biface fragment made from black translucent chert do not exhibit signs of thermal alteration, but the remaining hafted bifaces appear to be heated (71%, n=5), including the Savannah River and all three Otarre hafted bifaces. When considered in conjunction with the plowzone results, it appears that thermal alteration was often part of the hafted biface manufacturing process during the Late Archaic/Early Woodland periods, but was generally not practiced during the Middle or Late Woodland.

Stratum IV-b (Test Units 12 and 14). Sixteen hafted bifaces and biface fragments were recovered, only six of which are unidentifiable (see Table 16). These 16 hafted bifaces comprise 18% of the tool assemblage in this context. Diagnostic hafted bifaces include three Otarre, three Gypsy, two Swannanoa, and one Lonesome Pine. As was discussed in the previous chapter, all of these hafted bifaces appear to be closely related to one another, and can be generally associated with the transition from preceramic to ceramic-bearing assemblages. In addition, one Brewerton Cluster hafted biface was recovered, generally dating to the Late Archaic period.

Half of the hafted bifaces recovered exhibit signs of thermal alteration (50%, n=8). Hafted bifaces made from unidentified, heated chert include three unidentified types, one Swannanoa, and two Otarre. Other heated hafted bifaces include a Gypsy Stemmed made from banded chert and a Swannanoa made from gray chert.

Two unidentified hafted biface fragments are made from unidentified chert, but are unheated; another is made from unheated black translucent chert. The Brewerton Cluster, a Swannanoa, a Gypsy Stemmed, and an Otarre are all made from unheated black translucent chert as well. The Lonesome Pine hafted biface is unusual in that it is made from olive green chert, a raw material for which a few pieces of debitage have been recovered, but little else. This hafted biface assemblage is characterized by a variety of point types and raw material types, as well as varying frequencies of heat alteration within and between types.

Stratum IV-b (Test Units 19–30). Thirty hafted bifaces and biface fragments were recovered from this context, comprising 30% of the tool assemblage in Test Units 19–30 (see Table 14). Only about a third of these (36%, n=11) could be identified at some level (Table 18). Two early hafted bifaces include an Early Archaic Kirk Corner-Notched and a Paleoindian period Hardaway Side-Notched. Other identifiable hafted bifaces include one Gypsy Stemmed, one Swannanoa Stemmed, and three Lonesome Pine (defined in Chapter 3), all dating to the Late Archaic/Early Woodland transitional period. Four hafted bifaces could only be described as Archaic (n=1) or Late Archaic (n=3) stemmed points. Finally, 19 hafted bifaces exist only as proximal, distal, midsection, or unidentifiable fragments, and could not be assigned to any type, general or otherwise. The majority of the diagnostic hafted bifaces are Late Archaic or Late Archaic/Early Woodland transitional. Fourteen of the 30 hafted bifaces and biface fragments (47%) exhibit evidence of thermal alteration, a frequency similar to Stratum IV-b in Test Units 12 and 14, as well as to the staged biface assemblage described below. Most of the thermally altered hafted bifaces are represented by unidentifiable fragments (79%, n=11); identifiable types include two of the Lonesome Pines and one Gypsy Stemmed.

As in Stratum IV-b in Test Units 12 and 14, a wider variety of raw materials was used in the manufacture of hafted bifaces than in Stratum IV-a or plowzone contexts. There is also a wider range of chert types used in the manufacture of hafted bifaces than for other tools recovered from Stratum IV-b (see Table 15). Most are unidentified cherts (63%, n=19) and black translucent chert (23%, n=7), but gray chert (Archaic Stemmed), fossiliferous chert (Late Archaic stemmed), and jasper examples were recovered as well. The Kirk Corner-Notched biface used black translucent chert, as did one Lonesome Pine. The other two Lonesome Pine points used unidentified cherts, as did the Swannanoa, the Gypsy Stemmed, two Late Archaic Stemmed and the Hardaway Side-Notched.

Other Bifaces

The 179 artifacts in this category generally represent what are also known as staged bifaces or preforms, or the unfinished products of biface reduction (Table 19). Many are probable hafted biface preforms, but almost any of them could also serve as cutting tools.

The bifaces were classified according to reduction stages following criteria defined primarily by Callahan (1979). Stage 1 (n=12) represents the early stage of biface production, Stages 2 (n=59) and 3 (n=57) are intermediate stages, and Stage 4 (n=49) represents the latest stage of production. Two bifaces could not be assigned to a stage, and are classed as unidentifiable.

Microwear Results

A total of four Stage 3 bifaces and two Stage 4 bifaces were submitted for microwear analysis (see Appendix D). All of these tools were recovered from Stratum IV-b in Test Units 19–30. None of these tools exhibit use wear traces. Three of the Stage 3 bifaces were broken during the manufacturing process, as was one of the Stage 4 bifaces; it is not clear whether the second Stage 4 biface was broken during manufacture or during use as a projectile. The fourth Stage 3 biface was recycled from the distal portion of a broken biface, and small patches of hide polish on the lateral edges of the base suggest that the biface fragment may have been resharpened, hafted, and used as a projectile point.

Description of Other Bifaces

Spoil Contexts. Four bifaces were recovered from spoil contexts, three of them from the discarded Test Unit 7 plowzone. All four are made from unidentified chert. A complete Stage 2 biface exhibits no signs of thermal alteration; the proximal and distal fragments of two Stage 4 bifaces do appear to have been heated, as has a proximal fragment of a Stage 3 biface.

Feature Contexts. Two bifaces were recovered from feature contexts, one from Level B of Feature 7 and one from Feature 11 (see Table 17). Both bifaces are fragments of Stage 3 bifaces made from unidentified chert, and both exhibit signs of thermal alteration.

Plowzone Contexts. A total of 59 other bifaces were recovered from this context, comprising 36% of the tool assemblage in this context. Intermediate Stage 2 (34%,

Context	Swannanoa	Gypsy	Lonesome Pine	Hardaway Side-Notched	Archaic Stemmed		Kirk	Unidentified				Total
	C	*P*	*C*	*M*	*C*	*P*	*C*	*D*	*M*	*P*	*F*	
TU 19/IV-b1	0	1	1	0	0	0	0	1	0	2	0	5
TU 20/IV-b1	0	0	0	0	0	0	0	1	0	0	2	3
TU 21/IV-b1	0	0	0	0	2	0	1	1	0	0	0	4
TU 21/IV-b2	0	0	0	0	1	0	0	0	0	0	0	1
TU 22/IV-b2	0	0	1	0	0	0	0	0	0	0	1	2
TU 23/IV-b2	0	0	1	0	0	0	0	0	0	0	1	2
TU 23/IV-b3	0	0	0	0	0	0	0	0	0	0	1	1
TU 25/IV-b1	0	0	0	0	0	0	0	0	0	0	1	1
TU 28/IV-b1	0	0	0	0	0	0	0	0	0	1	1	2
TU 29/IV-b1	1	0	0	0	0	1	0	0	0	0	0	2
TU 30/IV-b1	0	0	0	0	0	0	0	1	0	2	0	3
TU 30/IV-b2	0	0	0	1	0	0	0	0	2	1	0	4
Total	1	1	3	1	3	1	1	4	2	6	7	30

C=complete; D=distal; M=midsection; P=proximal; F=miscellaneous/unidentifiable fragment

Table 18. Site 44LE165, Block B, Test Units 19-30, Stratum IV-b, hafted bifaces recovered by context.

Context	Unid.	Stage 1					Stage 2					Stage 3					Stage 4					Total
		C	*D*	*M*	*P*	*F*	*C*	*D*	*M*	*P*	*F*	*C*	*D*	*M*	*P*	*F*	*C*	*D*	*M*	*P*	*F*	
Spoil	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	1	4
Plowzone	2	0	0	1	0	0	0	0	1	2	17	0	4	1	0	10	0	3	5	1	12	59
Str. IV-a (TU 12,14)	0	1	1	0	0	2	2	0	2	1	4	0	1	3	0	3	0	0	2	4	0	26
Str. IV-b (TU 19–30)	0	2	0	0	2	0	1	0	0	3	4	0	2	3	1	9	1	3	5	1	5	42
Str. IV-b (TU 19–30)	0	3	0	0	0	0	4	3	5	3	5	1	4	4	0	8	1	0	1	1	2	45
Flotation	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Features	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Total	2	6	1	1	2	2	8	3	8	9	31	1	11	11	2	32	2	7	13	7	20	179

Str.=Stratum; Unid.=unidentifiable; C=complete; D=distal; M=midsection; P=proximal; F=miscellaneous/unidentifiable fragment

Table 19. Site 44LE165, unfinished bifaces recovered by general context.

n=20) and Stage 3 (25%, n=15) bifaces are common, as are later Stage 4 bifaces (36%, n=21); only one early Stage 1 biface was recovered (see Table 19).

A total of 39 bifaces (66%) exhibit signs of thermal alteration. This frequency is fairly consistent regardless of the reduction stage; thermally altered bifaces include Stage 2 (65%, n=13), Stage 3 (73%, n=11), and Stage 4 (67%, n=14). One of the two unidentifiable bifaces has been heated; the single Stage 1 biface was not thermally altered. The relatively high frequency of thermal alteration in the biface assemblage stands in contrast to the hafted biface assemblage in the plowzone. While eight of the hafted bifaces in the plowzone have been heated, all but one of these represent unidentifiable fragments. Complete, diagnostic hafted bifaces from the Middle and Late Woodland periods do not exhibit signs of thermal alteration. It may be that Stage 4 bifaces were heated and then worked into their final form with no additional heat applied, or it may be that thermally altered bifaces were used for the manufacture of tools other than hafted bifaces during the Middle and Late Woodland periods.

All of these bifaces are either fragmentary or incomplete, limiting the ability to provide positive functional classifications. Over 69% of the bifaces in the final three reduction stages consist of miscellaneous, unidentifiable fragments (see Table 19). Bifaces made from unidentified chert (71%, n=42) and black translucent chert (20%, n=12) account for nearly all of the assemblage, with gray chert (7%, n=4) and olive green chert (2%, n=1) comprising the remainder. This is again in contrast to the hafted biface assemblage, where gray, olive green, and banded cherts comprise 24% of these tools.

Stratum IV-a (Test Units 10, 12, 13, 14, and 18). A total of 26 other bifaces were recovered, comprising 46% of the tool assemblage in this context. Intermediate and late biface stages were recovered at roughly similar frequencies, with only slightly fewer early stage bifaces recovered.. Early Stage 1 bifaces comprise 15% (n=4) of the biface assemblage; intermediate Stage 2 (31%, n=8) and Stage 3 (27%, n=7) are the most common types. Later Stage 4 bifaces (n=6) account for 23% of the biface assemblage (see Table 19).

A total of 18 bifaces (69%) exhibit signs of thermal alteration, about the same frequency as the plowzone. The frequency of thermal alteration is relatively high for Stage 1 (75%, n=3), Stage 3 (86%, n=6), and Stage 4 (83%, n=5) bifaces, but noticeably lower for Stage 2 (44%, n=4). Overall, the relatively high frequency of thermal alteration in the biface assemblage is consistent with the results for the hafted biface assemblage (71%, n=5 heated hafted bifaces).

No surprisingly, the biface assemblage is less fragmentary than the plowzone assemblage, with three complete bifaces (12%) and only nine miscellaneous/unidentified fragments (35%) (see Table 19). Bifaces made from unidentified chert (69%, n=18) and black translucent chert (19%, n=5) account for nearly all of the assemblage, with one additional biface made from fossiliferous chert.

Stratum IV-b (Test Units 12 and 14). A total of 42 other bifaces were recovered, comprising 47% of the tool assemblage in this context. Frequencies are strongly weighted toward Stage 3 (36%, n=15) and Stage 4 bifaces (36%, n=15); bifaces in earlier stages of reduction are less common. Stage 1 bifaces comprise 10% (n=4) of the biface assemblage, and Stage 2 slightly more (19%, n=8) (see Table 19).

A total of 19 bifaces (45%) exhibit signs of thermal alteration, about the same frequency as the plowzone. The frequency of thermal alteration is highest for Stage 2 (50%, n=4) and Stage 4 (67%, n=10), but noticeably lower for Stages 1 and 3 (25%, n=1 and 27%, n=4 respectively). Overall, the frequency of thermal alteration in the biface assemblage is lower than in Stratum IV-a, and consistent with the results for Stratum IV-b in Test Units 19–30 (36%, n=16; see below).

Nearly half of the bifaces in the final two reduction stages (47%, n=14) consist of miscellaneous, unidentifiable fragments, with only one unbroken biface (see Table 19). In contrast, three Stage 1 and Stage 2 bifaces (25%) are complete, suggesting that breakage is more likely in the later stages. Unlike Stratum IV-a, a variety of raw materials were used in the manufacture of these bifaces, including examples of banded chert, jasper, and two bifaces made from gray chert, in addition to the usual unidentified chert (59%, n=25) and black translucent chert (31%, n=13).

Stratum IV-b (Test Units 19–30). A total of 45 other bifaces were recovered from this context, comprising 45% of the tool assemblage in this context. Most of the bifaces are intermediate stage (82%, n=37), while early (Stage 1) bifaces and late (Stage 4) bifaces occur at much lower frequencies (7%, n=3 and 11%, n=5 respectively) (Table 20). A total of 16 bifaces (36%) exhibit signs of thermal alteration, including most of the early and late stage bifaces (63%, n=5), suggesting that this is an integral part of the reduction process. This frequency is similar to that of the hafted biface assemblage (47%). The fragmentary or incomplete nature of most of these bifaces (80%, n=36) limits the ability to provide positive functional classifications. Over 40% of the bifaces in the final two reduction stages (Stage 3, n=8 and Stage 4, n=2) consist of miscellaneous, unidentifiable fragments (see Table 20). In contrast, all three Stage 1 bifaces are complete, and only 25% (n=5) of the Stage 2 bifaces are unidentifiable fragments, suggesting an increasing chance of error-related breakage in the later stages of manufacturing. Frequencies of unfinished bifaces made from unidentified chert (60%, n=27) or black translucent chert (33%, n=15) are about the same as those for hafted bifaces. One biface is made from gray chert, and two other limestone fragments mend to form a single biface.

Other Formal Tools

Seven types of other formal tools (n=23) are identified (Table 21). Most are endscrapers (22%, n=5) and hafted endscrapers (30%, n=7); other forms include graver/perforators, sidescrapers, two grooved axe fragments, a spokeshave, and a drill (Figures 25–27)

Context	Stage 1					Stage 2					Stage 3					Stage 4					Total
	C	*D*	*M*	*P*	*F*	*C*	*D*	*M*	*P*	*F*	*C*	*D*	*M*	*P*	*F*	*C*	*D*	*M*	*P*	*F*	
19/IV-b1	1	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	6
19/IV-b3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
20/IV-b1	0	0	0	0	0	1	0	0	1	0	0	0	2	0	0	0	0	0	0	0	4
21/IV-b1	1	0	0	0	0	1	2	0	1	0	0	1	1	0	1	0	0	0	0	1	9
22/IV-b1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	1	0	1	0	0	6
22/IV-b2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
23 IV-b1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
23 IV-b2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3
23 IV-b3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
24 IV-b1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2
29 IV-b1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
30 IV-b1	0	0	0	0	0	0	0	0	0	2	0	1	1	0	0	0	0	0	0	1	5
30 IV-b2	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
Total	3	0	0	0	0	4	3	5	3	5	1	4	4	0	8	1	0	1	1	2	45

C=complete; D=distal; M=midsection; P=proximal; F=miscellaneous/unidentifiable fragment

Table 20. Site 44LE165, Block B, Test Units 19-30, Stratum IV-b, bifaces recovered from ¼ in. screen, by context.

Microwear Results

A total of 11 other formal tools were submitted for microwear analysis (see Appendix D). Three of these tools were recovered from Stratum IV-b in Test Units 19–30, four were recovered from Stratum IV-b in Test Units 12 and 14, and four were recovered from the plowzone (Stratum I/II) in Test Units 5, 6, and 8. Five of these tools (45%) exhibit use wear traces.

Other formal tools recovered from Stratum IV-b in Test Units 19–30 and submitted for analysis include two endscrapers and one hafted endscraper. Neither of the endscrapers exhibit microwear traces; one appears to be a unifacially retouched core fragment, and the other appears to be a fractured and possibly unfinished tool that may have been rejected during the manufacturing process. The hafted endscraper, however, exhibits microwear traces that suggest it was being used as a hide scraper.

Other formal tools recovered from Stratum IV-b in Test Units 12 and 14 and submitted for analysis include one endscraper, two hafted endscrapers, and a spokeshave. The endscraper exhibits microwear traces that suggest it was used to scrape and soften dry hide (see Appendix D). One of the hafted endscrapers has fractures consistent with damage from being used as a projectile point; there appears to have been some attempt to work the broken point into a hafted endscraper, but it shows no signs of having been used in that manner. The other hafted endscraper appears to have been broken during manufacture and reworked into a hafted endscraper as well, but this too shows no signs of use. The spokeshave is a small stemmed hafted biface that has been unifacially reworked along one edge, giving the appearance of a spokeshave; however, there are no microwear traces that would indicate that it had been used in that fashion. It does exhibit damage, abrasion, and hafting traces that may relate to the use of the biface as a projectile point.

Other formal tools recovered from the plowzone (Stratum I/II) in Test Units 5, 6, and 8 and submitted for analysis include one sidescraper, one endscraper, one T-shaped drill, and one graver/perforator. The drill exhibits a fracture common on tools that have been broken during drilling. The drill also exhibits some hafting traces, but no microwear traces are evident on the basal portion submitted for analysis. The graver/perforator is a flake that has been retouched into the shape of a perforator, but no use wear or hafting traces are evident. The endscraper exhibits a break at the base that sug-

CONTEXT	ENDSCRAPER	HAFTED ENDSCRAPER	SPOKESHAVE	GRAVER/ PERFORATOR	DRILL	SIDESCRAPER	GROOVED AXE	TOTAL
Spoil	0	0	0	1	0	1	0	2
Plowzone	1	0	0	3	1	1	1	7
Stratum IV-a (TU 12, 14)	0	0	0	0	0	1	1	2
Stratum IV-b (TU 19–30)	2	6	1*	0	0	0	0	9
Stratum IV-b	2	1	0	0	0	0	0	3
Features	0	0	0	0	0	0	0	0
TOTAL	5	7	1	4	1	3	2	23

* reworked Otarre hafted biface

Table 21. Site 44LE165, other formal tools by general context.

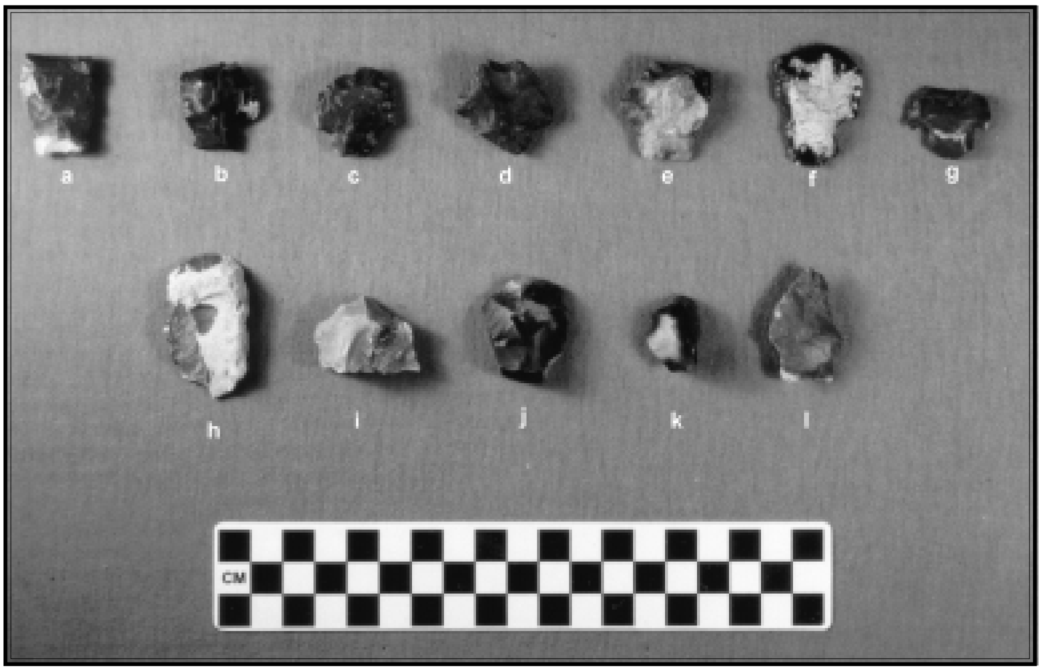


Figure 25. Site 44LE165, other formal tools in Late Archaic/Early Woodland Transitional contexts (a - hafted endscraper [TU 14 NW L. IV-b]; b - hafted endscraper [TU 14 NW L. IV-b]; c - hafted endscraper [TU 12 NW L. IV-b]; d - hafted endscraper [TU 12 NW L. IV-b]; e - hafted endscraper [TU 14 NW L. IV-b]; f - hafted endscraper [TU 23 L. IV-b2]; g - hafted endscraper [TU 12 NE L. IV-b]; h - endscraper [TU 12 NW L. IV-e]; i - endscraper [TU 14 NW L. IV-b]; j - endscraper [TU 19 L. IV-b1]; k - endscraper [TU 20 L. IV-b]; l - spokeshave [TU 14 NE L. IV-b])

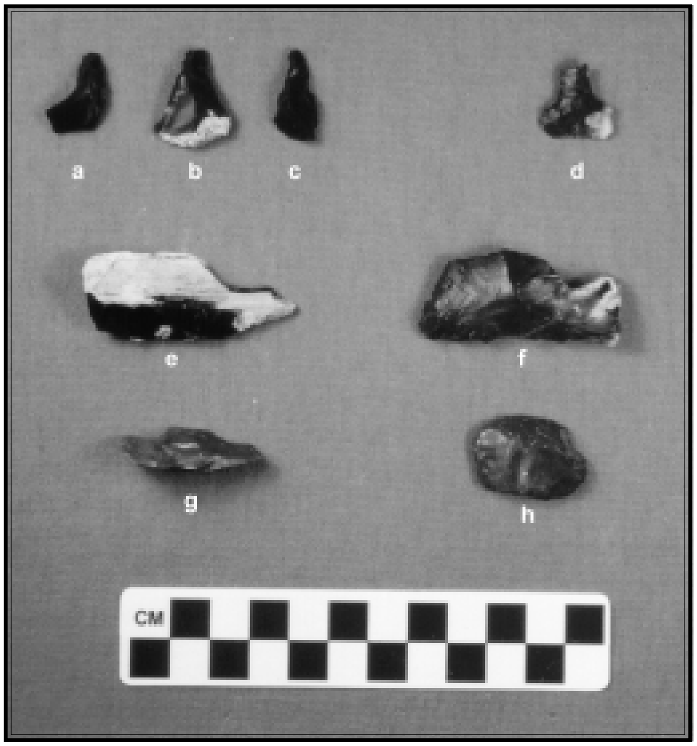


Figure 26. Site 44LE165, other formal tools in Middle and Late Woodland contexts (Strata I to IV-a) (a - graver/perforator [TU 5 L. I/II]; b - graver/perforator [TU 5 L. I/II]; c - graver/perforator [TU 6 L. I/II]; d - expanding-base drill [TU 6 L. I/II]; e - sidescraper [TU 5 L. I/II]; f - sidescraper [TU 8 L. I/II]; g - sidescraper [TU 12 NE L. IV-a]; h - endscraper [TU 5 L. I/II]).

Figure 27. Site 44LE165, formal ground stone in Middle and Late Woodland contexts (Strata I to IV-a) (left - grooved axe fragment [TU 9 SE L. I/II/III]; right - grooved axe fragment [TU 14 NE L. IV-a])

gests that it may have been hafted, but broken during use. Microwear traces indicate that the tool was used as a hide scraper. The sidescraper was originally a biface that suffered from several production failures, and was subsequently recycled into a hand-held skinning tool. The tool exhibits microwear traces consistent with fresh hide or meat cutting and scraping.

Descriptions of Other Formal Tools

Spoil Contexts. Two other formal tools were recovered from spoil contexts. One is a complete graver/perforator, reworked from a hafted biface that exhibits signs of thermal alteration. The complete sidescraper was found in the discarded Test Unit 8 plowzone, and may have been heated. Both are made from unidentified chert.

Feature Contexts. No other formal tools were recovered from feature contexts.

Plowzone Contexts. Seven other formal tools were recovered from this context, including an endscraper, three graver/perforators, an expanding-base drill, a sidescraper, and a grooved axe fragment (see Table 21). These more specialized tools account for only 4% of the tool assemblage in the plowzone. The endscraper is made from unidentified chert, and exhibits signs of thermal alteration; the drill, the gravers, and the sidescraper are all made of black translucent chert, and are all unheated. The axe fragment is the midsection of a greenstone axe.

Stratum IV-a (Test Units 10, 12, 13, 14, and 18). Only two other formal tools were recovered from this context, including a sidescraper and a grooved axe fragment (see Table 21). These two tools account for only 4% of the tool assemblage in Stratum IV-a. The sidescraper is made from unidentified chert, and exhibits signs of thermal alteration; the axe fragment is a miscellaneous/unidentified fragment of a greenstone axe.

Stratum IV-b (Test Units 12 and 14). Nine other formal tools were recovered from this context, including two endscrapers, six hafted endscrapers, and a spokeshave (see Table 21). These tools account for 10% of the tool assemblage in this context, and nearly 40% of all "other formal tools" combined. The two endscrapers are made from jasper and unidentified chert; the unidentified chert endscraper has been heated. The hafted endscrapers are primarily unidentified chert (83%, n=5), but one is made from black translucent chert.. All of the hafted endscrapers are reworked from hafted bifaces, and all but one (the black translucent chert) are thermally altered. The spokeshave is made from unidentified chert, with no signs of heating.

Stratum IV-b (Test Units 19–30). Three other formal tools were recovered from this context. Endscrapers were recovered from Test Units 19 and 20, and a hafted endscraper was recovered from Test Unit 23. The endscrapers, both made from unidentified chert, exhibit signs of thermal alteration, while the hafted endscraper (black translucent chert) does not. These three endscrapers comprise 3% of the tool assemblage in this context.

Informal Tools

Informal tools comprise 35% (n=150) of the tool assemblage, and include retouched flakes (59%, n=88), utilized flakes (39%, n=59), and informal ground stone (2%, n=3) (Table 22).

Microwear Results

A total of six retouched flakes and four utilized flakes were submitted for microwear analysis (Appendix D). All of these tools were recovered from Stratum IV-b in Test Units 19–30. Only three (30%) of these tools exhibit use wear traces. A utilized flake and a retouched flake recovered from Test Unit 23 (northwest of the hearth) exhibit microwear traces characteristic of skinning and butchering tools used for cutting and scraping meat or fresh hide (see Appendix D). A notch in the utilized flake was also used to scrape bone or antler. A retouched flake recovered closer to the hearth in Test Unit 19 is also a cutting or scraping tool, but it was used to cut or shred plant material, or to scrape or cut a wooden object. The retouch or "macrowear"on flakes exhibiting no signs of use wear may represent edge damage from trampling, or "spontaneous retouch" that can occur when the edges of flakes strike the blanks they are being detached from (see Appendix D).

Descriptions of Informal Tools

Feature Contexts. Two informal tools were recovered from feature contexts, both from Feature 7 (see Table 17). In Level A, a retouched flake made from black translucent chert was recovered. In Level B, a retouched flake made from unidentified chert was recovered. Both are straight-edged tools. The retouched flake in Level B exhibits signs of thermal alteration.

Plowzone Contexts. A total of 81 informal tools were recovered from this context, comprising 49% of the tool assemblage (see Table 8). These informal tools include 43 retouched flakes (53%), 36 utilized flakes (44%), and two pieces of ground stone. Most of the flaked stone tools are straight-edged (94%, n=75), except for a two

Context	Retouched Flake	Utilized Flake	Informal Ground Stone	Total
Spoil	0	0	0	0
Plowzone	43	36	2	81
Stratum IV-a (TU 12,14)	9	12	1	22
Stratum IV-b (TU 19–30)	16	6	0	22
Stratum IV-b	18	5	0	23
Features	2	0	0	2
Total	88	59	3	150

Table 22. Site 44LE165, informal tools by general context.

retouched flakes with straight/concave edges, two utilized flakes with straight/concave edges, and one utilized flake with a concave edge. One of the two pieces of informal ground stone is a hammerstone made from ferruginous sandstone; the other is a piece of quartzite that could not be further categorized. Twenty-six of the flaked stone tools (33%) exhibit signs of thermal alteration (16 retouched and 10 utilized). All of these informal tools are made from chert, generally unidentified (55%, n=44) or black translucent (43%, n=34); one utilized flake was made from gray chert.

Retouched and utilized flakes are identified at much higher frequencies in Middle/Late Woodland plowzone assemblage than elsewhere on the site. A total of 79 utilized or retouched flakes were recovered from this context, accounting for 54% of the entire site assemblage of informal flaked-stone tools and 49% of the total plowzone tool assemblage.

Stratum IV-a (Test Units 10, 12, 13, 14, and 18). A total of 22 informal tools were recovered from this context, comprising 39% of the tool assemblage (see Table 8). These informal tools include nine retouched flakes (41%), 12 utilized flakes (55%), and one piece of ground stone. Most of the flaked stone tools are straight-edged (95%, n=21), except for one retouched flake with a straight/concave edge. The piece of informal ground stone is an unidentified piece of sandstone that has been fire-cracked, but could not be further categorized. Only four of the flaked stone tools (18%) exhibit signs of thermal alteration (three retouched and one utilized). All of these informal tools are made from unidentified chert (52%, n=11) or black translucent (48%, n=10).

Stratum IV-b (Test Units 12 and 14). A total of 22 informal tools were recovered from this context, comprising 25% of the tool assemblage (see Table 8). These informal tools include 16 retouched flakes (73%) and six utilized flakes (27%). Most of the flaked stone tools are straight-edged (86%, n=19), except for one retouched flake with a concave edge, one retouched flake with a straight/concave edge, and one utilized flake with a straight/concave edge. Only four of the flaked stone tools (18%) exhibit signs of thermal alteration (three retouched and one utilized). All of these informal tools are made from unidentified chert (23%, n=5) or black translucent (77%, n=17).

Stratum IV-b (Test Units 19–30). A total of 23 informal tools were recovered from this context, comprising 23% of the tool assemblage (see Table 14). These informal tools include 18 retouched flakes (78%) and five utilized flakes (22%). All of these tools are straight-edged, except for a graver/spur in recovered from Test Unit 19. Only four of these tools (17%) exhibit signs of thermal alteration (three retouched and one utilized). All of these informal tools are made from chert, generally unidentified or black translucent; one retouched flake was made from gray chert (see Table 15).

Cores

A total of 59 cores were recovered; identifiable types include 11 random (19%), nine lamellar(15%), six bifacial (10%), and one bipolar (Table 23). One other unidentifiable form was also recovered, as well as 31 core fragments (53%).

Feature Contexts

One core was recovered from feature contexts (see Table 23). The Feature 11 assemblage includes a core fragment made from black translucent chert; there are no signs of thermal alteration.

Context	Lamellar	Bifacial	Random	Bipolar	Other Fragment	Core	Total
Spoil	0	0	0	0	0	0	0
Plowzone	6	2	0	0	0	9	17
Stratum IV-a (TU 12,14)	1	0	0	0	0	5	6
Stratum IV-b (TU 19–30)	0	1	3	0	0	4	8
Stratum IV-b	2.	3	8	1	1	12	27
Features	0	0	0	0	0	1	1
Total	9	6	11	1	1	31	59

Table 23. Site 44LE165, lithic cores by general context.

Plowzone Contexts

A total of 17 cores were recovered from this context (see Table 23). Lamellar cores comprise the majority of a limited number of identifiable types (35%, n=6); the only other form is represented by two bifacial cores. The remaining nine cores are unidentifiable fragments (53%). Only one core fragment (made from unidentified chert) exhibits signs of thermal alteration. All of the cores are either black translucent chert (65%, n=11) or unidentified chert (35%, n=6).

Stratum IV-a (Test Units 10, 12, 13, 14, and 18)

A total of 6 cores were recovered from this context (see Table 23). The only identifiable type is a lamellar core made from unidentified chert; the remaining cores are all core fragments. Only the lamellar core exhibits signs of thermal alteration. Four of the core fragments are black translucent chert, and one is unidentifiable chert.

Stratum IV-b (Test Units 12 and 14)

A total of 8 cores were recovered from this context (see Table 23). Identifiable types include random cores (n=3) and one bifacial core; the remaining cores are core fragments. None of the cores exhibit signs of thermal alteration. Six of the core fragments are black translucent chert (75%), and two are unidentifiable chert.

Stratum IV-b (Test Units 19–30)

A total of 27 cores were recovered from this context (see Table 14). Random cores comprise the majority of identifiable types (30%, n=8); other forms include bifacial (n=3), lamellar (n=2), and bipolar (n=1). An additional core is described in the inventory as "other form" (see Appendix A). This piece, recovered from Level IV-b2 of Test Unit 23, is complete but with a several rather large flake scars that make it difficult to definitively determine the core type; it bears the greatest similarity to a lamellar core. The remaining 12 cores are unidentifiable fragments (41%, n=12). Only six cores (four fragments and two random) exhibit sign of thermal alteration (19%), and all six are unidentified chert. All of the cores are either black translucent chert (59%, n=16) or unidentified chert (41%, n=11).

Debitage

A total of 14, 053 pieces of debitage were recovered, comprising 86% of the assemblage recovered during the data recovery phase (see Table 8). Of these, 10,452 pieces of debitage (74%) were completely analyzed with regard to form, color, and cortex. Debitage not analyzed includes the plowzone contexts in Test Units 9–17 (n=2535), and flotation debitage smaller than 0.25 in. (n=1068), as discussed in the introduction to this chapter.

Most of the analyzed debitage assemblage consists of flake fragments/shatter (58%, n=6095) and secondary/biface thinning flakes (37%, n=3908) (Table 24). Other debitage types include primary/reduction flakes (3%, n=307), angular, blocky fragments/chunks (1%, n=122), tested cobbles (n=11), a few tertiary flakes (n=8), and one bipolar flake.

Eleven different kinds of raw materials are present in the debitage assemblage (see Table 11). Most of the analyzed debitage is unidentified chert, which comprises 88% (n=9202) of the debitage assemblage (not including debitage less than 0.25 in., which was assigned to the unidentified chert category by default). A total of 1110 pieces of black translucent chert debitage (11% of the assemblage) was recovered as well. Only 34 pieces

Context	PR	SBT	TR	FFS	ABF	BP	TCN	Total
Spoil	1	2	0	2	0	0	0	5
Plowzone*	67	676	0	1204	32	0	0	1979
Stratum IV-a (TU 12,14)	44	950	0	1443	19	0	1	2457
Stratum IV-b (TU 19–30)	73	978	2	1519	19	0	3	2594
Stratum IV-b (TU 19–30)	112	1193	6	1729	48	1	7	3096
Stratum IV-b Flotation**	0	9	0	25	0	0	0	34
Features	10	82	0	140	3	0	0	235
Feature Flotation***	0	18	0	33	1	0	0	52
Total	307	3908	8	6095	122	1	11	10452

* 1,979 pieces of debitage analyzed; the remaining 2535 were not analyzed

** 34 pieces of debitage larger than 0.25 in. were analyzed; the remaining 689 pieces are smaller than 0.25 in. and not analyzed

*** 52 pieces of debitage larger than 0.25 in. were analyzed; the remaining 379 pieces are smaller than 0.25 in. and not analyzed

PR= Primary/Reduction Flake
SBT=Secondary/Bifacial Thinning Flake
TR=Tertiary/Retouch Flake
FFS=Flake Fragment/Shatter
ABF=Angular, Blocky Fragments/Chunks
BP=Bipolar Flake
TCN=Tested Cobble/Nodule

Table 24. Site 44LE165, debitage type by general context.

of debitage or less were recovered for each of the remaining nine raw material types, including olive green chert, fossiliferous chert, quartzite, gray chert, mottled white chert, oolitic chert, jasper, chalcedony, and porphyritic rhyolite (see Table 11).

Most of the debitage has at least some cortex (55%, n=5,762), with some consisting of 75% or more cortex (15%, n=1516) (Table 25). Noncortical debitage comprises 45% (n=4690) of the debitage assemblage.

Debitage from several contexts was examined for signs of thermal alteration, including the plowzone contexts in Test Units 5–8, all feature contexts, Strata IV-a and IV-b in the northeast quarter of Test Unit 14, and Stratum IV-b in Test Unit 21 (Levels IV-b1 and IV-b2). A total of 3,789 pieces of debitage were examined, and 51% (n=1931) exhibit signs of thermal alteration (Table 26).

Spoil Contexts

Five pieces of debitage were recovered from spoil contexts, including two pieces of black translucent chert, two pieces of unidentified chert, and one piece of gray chert. The black translucent chert debitage are a noncortical flake fragment/shatter and a primary/reduction flake with >75% cortex. The unidentified chert debitage are both noncortical secondary/biface thinning flakes. The gray chert flake is a noncortical flake fragment/shatter.

Feature Contexts

A total of 666 pieces of debitage were recovered from feature contexts, including 379 pieces from the flotation process that measure less than 0.25 in. (see Table 17). All fill in Features 8, 9, and 15–17 was floted. Debitage recovered from the flotation process in the lab that measured less than 0.25 in. was not analyzed, other than a general classification as unidentified chert debitage. *The following frequencies consider only debitage larger than 0.25 in. (n=287) from screen and flotation contexts.*

Most of the analyzed debitage assemblage consists of flake fragments/shatter (60%, n=173) and secondary/biface thinning flakes (35%, n=100) (see Table 24). Other debitage types include primary/reduction flakes (3%, n=10), and angular, blocky fragments/chunks (1%, n=4).

Feature Stratum	Non-cortical	1-74% Cortex	>75% Cortex	Totals
Spoil	4	0	1	5
Plowzone*	886	871	222	1979
Stratum IV-a (TU 12,14)	966	1071	420	2457
Stratum IV-b (TU 19–30)	1267	974	353	2594
Stratum IV-b (TU 19–30)	1403	1216	477	3096
Stratum IV-b14 Flotaion**	14	6	34	
Features	132	74	29	235
Feature Flotation***	18	26	8	52
Total	4690	4246	1516	10452

* 1,979 pieces of debitage analyzed; remaining 2535 not analyzed

** 34 pieces of debitage > 0.25 in. analyzed; remaining 689 pieces < 0.25 in. and not analyzed

*** 52 pieces of debitage > 0.25 in. analyzed; remaining 379 pieces < 0.25 in. and not analyzed

Table 25. Site 44LE165, debitage percent cortex by general context.

Six different kinds of raw materials are present in the debitage assemblage (see Table 11). Most of the debitage is unidentified chert, which comprises 71% (n=204) of the debitage assemblage (not including 379 pieces of debitage less than 0.25 in., which was assigned to the unidentified chert category by default). A total of 68 pieces of black translucent chert debitage (24% of the assemblage) was recovered as well. Other raw material types include gray chert (2%, n=6), mottled white chert and oolitic chert (1%, n=4 each), and one piece of olive green chert.

Most of the debitage is noncortical (52%, n=150) (see Table 25). A total of 100 pieces of debitage (35%) has 1–74% cortex, and 13% (n=37) consists of 75% or more cortex.

A total of 114 pieces of debitage in feature contexts exhibit signs of thermal alteration (40%) (see Table 26). All of the heat-altered debitage is unidentified chert (n=113), except for one piece of heated oolitic chert. Fifty-five percent of the unidentified chert is thermally altered. Most of the heat-altered debitage was found in Feature 7 (n=105, 93%), with only a few in Features 5, 6, 11, and 12.

Plowzone Contexts

A total of 4,514 pieces of debitage were recovered from plowzone contexts, including 2,535 pieces of debitage (56%) that were not analyzed beyond classification of debitage (see Table 10). *The following frequencies consider only the 1,979 pieces of analyzed debitage.*

Most of the analyzed debitage assemblage consists of flake fragments/shatter (61%, n=1204) and secondary/biface thinning flakes (34%, n=676) (see Table 24). Other debitage types include primary/reduction flakes (3%, n=67), and angular, blocky fragments/chunks (2%, n=32).

Eight different kinds of raw materials are present in the debitage assemblage (see Table 11). Most of the debitage is unidentified chert, which comprises 75% (n=1475) of the debitage assemblage. A total of 448 pieces of black translucent chert debitage (23% of the assemblage) was recovered as well. Other raw material types include olive green chert (1%, n=27), fossiliferous chert (<1%, n=14), gray and oolitic chert (n=5 each), mottled white chert (n=3), and two pieces of quartzite.

Most of the debitage has at least some cortex (55%, n=1093), with some consisting of 75% or more cortex (11%, n=222) (see Table 25). Noncortical debitage comprises 45% (n=886) of the debitage assemblage.

A total of 1089 pieces (55%) of debitage from plowzone contexts in Test Units 5–8 exhibit signs of thermal alteration (see Table 26). Most of the heat-altered debitage is unidentified chert (99%, n=1078); other heated raw materials include fossiliferous chert (n=7) and two pieces each of oolitic chert and black translucent chert. Much of the unidentified chert assemblage is thermally altered (73%, n=1,078), as well as half of the fossiliferous chert (50%, n=7) and two of the three pieces of oolitic chert. Only two of the 448 pieces of black translucent chert appears heat-altered, however.

Stratum IV-a (Test Units 10, 12, 13, 14, and 18)

A total of 2,457 pieces of debitage were recovered from Stratum IV-a, all of which were completely analyzed (see Table 12). Most of the debitage assemblage consists of flake fragments/shatter (59%, n=1443) and secondary/biface thinning flakes (39%, n=950) (see Table 24). Other debitage types include primary/reduction flakes (2%, n=44), angular, blocky fragments/chunks (<1%, n=19), and one tested cobble/nodule.

Eight different kinds of raw materials are present in the debitage assemblage (see Table 11). Most of the debitage is unidentified chert, which comprises 93% (n=2282) of the debitage assemblage, a much higher frequency than in the plowzone strata. Only 149 pieces of black translucent chert debitage (6% of the assemblage) were recovered. Other raw material types include quartzite (n=13), mottled white chert (n=6), two pieces each of olive green chert, fossiliferous chert, and jasper, and the only piece of chalcedony debitage recovered during the data recovery phase.

Most of the debitage has at least some cortex (58%, n=1491), with some consisting of 75% or more cortex (16%, n=420) (see Table 25). Noncortical debitage comprises 38% (n=966) of the debitage assemblage.

Debitage in the northeast quarter of Test Unit 14 (n=588) was evaluated for thermal alteration. A total of 348 pieces (59%) of debitage from Stratum IV-a in this context exhibits signs of thermal alteration, a slightly higher frequency than in the plowzone (see Table 26). Most of the heat-altered debitage is unidentified chert (99%, n=198); other heated raw materials include fossiliferous chert (n=2), mottled white chert (n=2), and jasper (n=1). Much of the unidentified chert assemblage is thermally altered (81%, n=343). None of the 149 pieces of black translucent chert has been heat-altered, however.

Stratum IV-b (Test Units 12 and 14)

A total of 2,594 pieces of debitage were recovered from Stratum IV-b in these units, all of which were completely analyzed (see Table 13). Most of the debitage assemblage consists of flake fragments/shatter (59%, n=1519) and secondary/biface thinning flakes (38%, n=978), nearly identical to frequencies in both the plowzone and in Stratum IV-a (see Table 24). Other debitage types include primary/reduction flakes (3%, n=73), angular, blocky fragments/chunks (<1%, n=19), three tested cobble/nodules, and two tertiary/retouch flakes.

Only five different kinds of raw materials are present in the debitage assemblage (see Table 11). Most of the debitage is unidentified chert, which comprises 92% (n=2,385) of the debitage assemblage, about the same frequency as Stratum IV-a but much higher than in the plowzone strata. Only 189 pieces of black translucent chert debitage (7% of the assemblage) were recovered. Other raw material types include fossiliferous chert (<1%, n=14) quartzite (n=5), and one piece of mottled white chert.

About half of the debitage has at least some cortex (51%, n=1327), with some consisting of 75% or more cortex (14%, n=353) (see Table 25). Noncortical debitage comprises 49% (n=1267) of the debitage assemblage, a somewhat higher frequency than in Stratum IV-a.

Debitage in the northeast quarter of Test Unit 14 (n=458) was evaluated for thermal alteration. A total of

Context	UC		FC		OC		BTC		MWC		JS		Other		Totals	
	U	*H*	*U*	*H*	*U*	*H*	*U*	*H*	*U*	*H*	*U*	*H*	*U*	*H*	*U*	*H*
Features	91	113	0	0	3	1	68	0	4	0	0	0	7	0	173	114
Plowzone TU 14NE	397	1078	7	7	3	2	446	2	3	0	0	0	34	0	890	1089
TU 14/NE/ Str. IV-a	82	343	0	2	0	0	149	0	4	2	1	1	4	0	240	348
TU 21/ Str. IV-b	56	198	3	11	0	0	185	4	1	0	0	0	0	0	245	213
TU 21/ Level IV-b1	42	117	0	0	1	0	180	10	0	0	0	0	4	1	227	128
TU 21/ Level IV-b2	25	33	0	0	1	0	54	6	0	0	0	0	3	3	83	39
Total	693	1882	10	20	8	3	1082	22	12	2	1	1	52	4	1858	1931

UC=Unidentified Chert BTC=Black Translucent Chert U=Unheated Str.=Stratum
FC=Fossiliferous Chert MWC=Mottled White Chert H=Heated
OC=Oolitic Chert JS=Jasper TU=Test Unit

Table 26. Site 44LE165, thermally altered debitage recovered from the ¼ in. screen, by general context.

213 pieces (47%) of debitage from Stratum IV-b in this context exhibits signs of thermal alteration, slightly lower frequency than in Stratum IV-a (see Table 26). Most of the heat-altered debitage is unidentified chert (93%, n=198); other heated raw materials include fossiliferous chert (n=11) and black translucent chert (n=4). Much of the unidentified chert assemblage is thermally altered (78%, n=198), as well as most of the fossiliferous chert (79%, n=11). Only four of the 189 pieces of black translucent chert appears heat-altered, however.

Stratum IV-b (Test Units 19–30)

A total of 3,819 pieces of debitage were recovered from Stratum IV-b in these units, including 689 pieces from the flotation process that measure less than 0.25 in. (see Table 14). A 6-liter soil sample was floted in one selected level of each unit, and in all four levels of Test Unit 24. Debitage recovered from the flotation process in the lab that measured less than 0.25 in. was not analyzed, other than a general classification as unidentified chert debitage. *The following frequencies consider only debitage larger than 0.25 in. (n=3130) from screen and flotation contexts.*

Most of the analyzed debitage assemblage consists of flake fragments/shatter (56%, n=1754) and secondary/biface thinning flakes (38%, n=1202) (see Table 24). Other debitage types include primary/reduction flakes (4%, n=112), angular, blocky fragments/chunks (2%, n=48), tested cobble/nodules (n=7), tertiary/retouch flakes (n=6), and one bipolar flake. Stratum IV-b in these units accounts for 64% (n=7) of the tested cobbles/nodules recovered during the data recovery phase.

Eight different kinds of raw materials are present in the debitage assemblage (see Table 11). Most of the debitage is unidentified chert, which comprises 91% (n=2854) of the debitage assemblage (not including 689 pieces of debitage less than 0.25 in., which was assigned to the unidentified chert category by default). A total of 254 pieces of black translucent chert debitage (8% of the assemblage) was recovered as well. Other raw material types include gray chert (n=7), quartzite (n=6), olive green chert (n=4), two pieces each of oolitic chert and jasper, and the only piece of porphyritic rhyolite recovered during the data recovery phase.

Most of the debitage has at least some cortex (55%, n=1713), with some consisting of 75% or more cortex (15%, n=483) (see Table 25). Noncortical debitage comprises 45% (n=1417) of the debitage assemblage.

Debitage in Test Unit 21 (n=477) was evaluated for thermal alteration. A total of 167 pieces (35%) of debitage from Stratum IV-b in this context exhibits signs of thermal alteration, a far lower frequency than in any other context (see Table 26). This frequency is relatively consistent between Levels IV-b1 (36%, n=128) and IV-b2 (32%, n=39) in this unit. Most of the heat-altered debitage is unidentified chert (90%, n=150); other heated raw materials include black translucent chert (n=16). While over half of the unidentified chert assemblage is thermally altered (69%, n=150), this too is a much lower frequency than in other contexts. Sixteen of the 250 pieces of black translucent chert (6%) has been heat-altered.

Other Ground Stone

Stratum IV-b (Test Units 19–30)

A formal ground stone artifact was found in Level IV-b1 in Test Unit 19. This fragment is flat and polished smooth on one side, measuring about 4.0 × 2.5 cm and only about 0.05 cm thick. It is rough on the opposite side, and is clearly a fragment of a larger piece. Its function is unknown.

Fire-Cracked Rock

A total of 1,699 piece of fire-cracked rock was recovered during data recovery excavations, comprising 10% of the site's artifact assemblage (see Table 8).

Feature Contexts

A total of 69 pieces of fire-cracked rock were recovered from feature contexts, all but one from Feature 7 (see Table 17). Thirty-two were recovered from Level A in Feature 7, 11 from Level B, 12 from Level C, and 13 during the final cleanup of the feature. One piece of fire-cracked rock was found in Feature 11.

Plowzone Contexts

A total of 270 pieces of fire-cracked rock was recovered from the plowzone, accounting for 16% of all fire-cracked rock from the site and only 5% of the artifact assemblage in the plowzone.

Stratum IV-a (Test Units 10, 12–14, and 18)

A total of 144 pieces of fire-cracked rock were recovered from Stratum IV-a, accounting for only 8% of all fire-cracked rock from the site and 5% of the artifacts from this context.

Stratum IV-b (Test Units 12 and 14)

A total of 362 pieces of fire-cracked rock were recovered from this context, accounting for 21% of all fire-cracked rock from the site and 12% of the artifacts from this context.

Stratum IV-b (Test Units 19–30)

A total of 854 pieces of fire-cracked rock were recovered from this context, primarily from the first 0.1 m (74%, n=635) (see Table 14). Fire-cracked rock accounts for 21% of the artifacts from the stratum, and 50% of all fire-cracked rock on the site. The average weight per fire-cracked rock is 0.11 kg; most are rather uniform, fist-sized, and very similar to the unmodified rock found in Features 10–14 and in Stratum IV-b in general (Table 27). This suggests that the informal hearth (described in the previous chapter as Feature 18) was gathered from materials close at hand, in contrast to, for example, a large, formal fire-pit recently identified at an Early Woodland site in Russell County, Virginia, that contained much larger pieces of fire-cracked rock that weighed on average nearly 1.00 kg each (Pullins n.d.).

Miscellaneous/unmodified stone

Stone was quite common at 44LE165, primarily in Stratum IV-b but also in other contexts such as Features 11 and 12. Since unmodified stone could not be reliably distinguished from fire-cracked rock in the often muddy field conditions, all excavated rock was retained for analysis in the labs. The resulting large inventory of miscellaneous/unmodified stone was, in fact, helpful in the analysis of site structure. A total of 4,717 pieces of miscellaneous/unmodified stone were recovered, comprising 22% of all material returned to the lab.

Feature Contexts

A total of 283 pieces of miscellaneous/unmodified stone were recovered from feature contexts, primarily Features 11 (51%, n=143) and 12 (45%, n=127) (see Table 17). In addition to these, however, there are 232 pieces of limestone recovered from Feature 7, primarily Level B (75%, n=175). At least some and perhaps all of this limestone has been heated, although it does not appear as the classic "fire-cracked rock."

Plowzone Contexts

Sixty-eight pieces of miscellaneous/unmodified stone were recovered from the plowzone, only 1% of the stone assemblage returned to the lab.

Test Unit	Level	FCR		Misc. Stone	
		Count	kg	Count	kg
19	IV-b1	127	11.70	51	3.25
20	IV-b1	30	2.00	901	72.91
21	IV-b1	136	13.94	286	25.10
22	IV-b1	11	0.95	100	12.25
23	IV-b1	43	6.01	92	7.91
24	IV-b1	59	7.50	125	13.00
25	IV-b1	4	0.26	52	3.45
28	IV-b1	32	2.70	60	3.55
29	IV-b1	27	3.15	147	17.10
30	IV-b1	166	19.00	51	3.66
19	IV-b2	22	2.72	35	4.30
21	IV-b2	7	0.75	64	6.50
22	IV-b2	43	4.00	913	107.55
23	IV-b2	27	3.10	110	11.93
24	IV-b2	15	2.10	64	5.85
28	IV-b2	0	0	0	0
29	IV-b2	1	0.14	45	3.31
30	IV-b2	37	3.85	80	8.51
22	IV-b3	13	1.00	162	17.95
23	IV-b3	48	3.85	168	16.95
24	IV-b3	3	0.35	19	1.50
28	IV-b3	0	0.00	60	3.60
22	IV-b4	1	0.28	24	2.95
24	IV-b4	0	0.00	7	0.50
19	IV-b3	2	0.30	1	0.17
Total		854	89.7	3617	354

Table 27. Site 44LE165, Block B, fire-cracked rock and unmodified rock recovered from Stratum IV-b.

Stratum IV-a (Test Units 10, 12–14, and 18)

A total of 132 pieces of miscellaneous/unmodified stone were recovered from Stratum IV-a, comprising only 3% of the stone assemblage returned to the lab but represent a noticeable increase over the plowzone.

Stratum IV-b (Test Units 12 and 14)

A total of 385 pieces of miscellaneous/unmodified stone were recovered from this context, comprising only 8% of the stone assemblage returned to the lab. Stone frequency continues to increase in this stratum.

Stratum IV-b (Test Units 19–30)

A total of 3,617 pieces of miscellaneous/unmodified stone (354 kg) were recovered from this context, comprising 77% of all stone returned to the lab (see Tables

Context	Sherd (n)	Temper	Surface Treatment	Ware Type
TU 5/Pz	Body (1)	Sand	Simple-stamped	Connestee (Middle Woodland)
TU 6/Pz	Body(1)	Limestone	Plain	Radford (Late Woodland)
TU 9/Pz	Body (1)	Limestone	Eroded	Uncertain
TU 11/Pz	Body (1)	Sand	Unidentifiable	Connestee?
TU 15/Pz	Body (1)	Sand	Unidentifiable	Connestee?
TU 12NE/IV-a	Body (1)	Limestone	Textile-impressed?	Radford?
Feature 7A	Body (2)	Limestone	Cordmarked	Radford (Late Woodland)
Feature 7A	Body (23)	Limestone	Eroded (Vessel 1)	Uncertain
Feature 7A	Body (6)	Limestone	Unidentifiable	Uncertain
Feature 7B	Vessel 1	Limestone	Cordmarked/Incised	Uncertain
Feature 7C	Body (1)	Limestone	Unidentifiable	Uncertain

TU=Test Unit; Pz=Plowzone

Table 28. Site 44LE165, prehistoric ceramics by specific context.

14 and 27). Recovery frequency was notable in both the first 0.1-m level (52%, n=1865) and the second 0.1-m level (36%, n=1311). The average weight per stone is about the same as the fire-cracked rock at 0.1 kg, suggesting that material for the hearth was informally gathered from the stone immediately at hand.

Ceramic Artifacts

Thirty-eight ceramic sherds and one ceramic vessel were identified (Table 28). The vessel and most of the sherds (n=32) were found in Feature 7; the remaining sherds are from the plowzone (n=5) and Stratum IV-a (n=1)

Plowzone Contexts

Five ceramic sherds were recovered from plowzone contexts in Test Units 5, 6, 9, 11, and 15 (see Table 28). Three of the sherds are sand-tempered, and two are limestone-tempered; plowzone in the Block B activity area contains both sand- and limestone-tempered sherds. One of the limestone-tempered sherds is plain, and one of the sand-tempered sherds is a simple-stamped Connestee ware, dating from the Middle Woodland period. The plain limestone-tempered sherd belongs to the Radford type and dates from the Late Woodland period, confirming that the plowzone contains both Middle and Late Woodland contexts.

Stratum IV-a (Test Units 10, 12–14, and 18)

A single ceramic sherd was recovered from this context in the northeast quarter of Test Unit 12 (see Table 28). The sherd is limestone-tempered; the surface treatment is generally unidentifiable, but may be textile-impressed. If so, then the sherd represents the Late Woodland Radford type.

Feature Contexts

All of the ceramic artifacts from feature contexts were found in Feature 7. The inventory lists 33 ceramic artifacts in Feature 7, but in fact this includes 32 ceramic sherds and one vessel that was recovered in many small fragments (see Appendix A).

Level A in Feature 7 contained 31 sherds, all limestone-tempered. Two of the sherds are cord-marked Radford ware body sherds. Twenty-three other body sherds are eroded and appear to belong to Vessel 1 in Level B. The remaining six body sherds are limestone-tempered, but otherwise unidentifiable.

Level B in Feature 7 contained the remains of Vessel 1, crushed and (for the most part) *in situ* above a later of limestone and charred wood. This vessel is in rather poor condition, with individual sherds soft, wet, and extremely friable; temper and type were not immediately obvious in the field. The vessel was removed in two block of soil and numerous smaller fragments and taken to the laboratory for closer analysis, but little progress was made due to an inability to stabilize individual sherds in the lab. A few sherds were also recovered from Levels A and C in Feature 7 that clearly belong to this vessel. In the Appendix A inventory, this vessel appears as a single entry (Vessel 1) in Level B, which includes both soil blocks and all related sherds in the context. Sherds belonging to Vessel 1 that were found in Layers A and C are enumerated separately by context.

Vessel characteristics could be observed to varying degrees. The exterior surface is at least partially cord-marked, with a smoothed neck and incised, oblique parallel lines on the neck to a point just below the lip. The rim is flat and probably straight, but the overall vessel form will remain uncertain unless the sherds can be stabilized and reassembled. The vessel was examined in the laboratory by Keith Egloff of the Virginia Department of Historic Resources, who was unable to establish a definite type but said that it appeared to be limestone-tempered and "Radford-like." Traditional Radford ceramics have surface treatments that are primarily net-impressed, with some cord-marked, scraped, smoothed, plain, corncob-impressed, and (rarely) stamped variations identified as well (Egloff 1990; Holland 1970). Exterior decorations include, among others, incised decorations on the body with parallel lines or crude oblique, herringbone, or chevron patterns (Holland 1970, Egloff 1990). Radford ceramics are generally dated to the Late Woodland period, from around AD 1000 to 1700 in southwestern Virginia (Egloff 1990).

Level C contained one unidentifiable, limestone-tempered sherd.

Faunal Material

A single piece of bone was recovered from the entire site. This bone fragment was found in Level B of Feature 7, resting on a piece of limestone (see Figure 14). This bone fragment was examined by faunal specialist Joanne Bowen of the Colonial Williamsburg Department of Archaeology, who confirmed that it is not human, but probably part of an unidentified mammalian long bone. Unfortunately, the bone was too fragmentary to provide a more specific identification. Its presence does, however, suggest that the pit was involved in food processing, either in preparation or disposal.

Ethnobotanical Material

Flotation processing of 30 liters of feature fill from 44LE165 yielded 122.4 grams of carbonized plant material, or an average density of 4.08 grams of carbon per liter. This material was analyzed by Justine Woodard McKnight (see Appendix C). Wood charcoal was the most abundant class of material recovered, comprising 97% (by weight) of the flotation-recovered botanical sample. A total of 1,566 carbonized wood fragments weighing 119.29 grams was recovered. Of the total wood remains, a sub-sample of 92 fragments (a maximum of 20 fragments per sample) was randomly selected for identification. The site wood sample revealed a predominance of hickory *(Carya sp.)* (30% of the identified wood, by count), American holly *(Ilex opaca)* (9%), black walnut *(Juglans nigra)* (8%), white oak *(Quercus sp. [LEUCOBALANUS group])* (7%), American chestnut *(Castanea dentata)* (7%), unclassified oak (*Quercus sp.*) (4%), and maple or birch (*Acer/Betula*) (2%). Also identified were minor quantities (1%) of maple *(Acer sp.)*, dogwood *(Cornus florida)*, ash *(Fraxinus sp.)*, eastern red cedar *(Juniperus virginiana)*, and American elm *(Ulmus americana)*. Poorly preserved wood specimens were assigned to the categories "ring porous" (12%), "deciduous taxa" (11%) or "unidentifiable" (5%) due to the fragmented and eroded nature of the specimens.

Nutshell remains recovered from 44LE165 included 143 fragments of thick-walled hickory nutshell *(Carya sp.)* and 5 nutshell fragments belonging to the walnut family *(JUGLANDACEAE)*. Nutshell remains occurred in one hundred% of the Late Archaic/Early Woodland features sampled, but in only 33% of the early Late Woodland features sampled.

Corn *(Zea mays)* remains were identified from early Late Woodland contexts at 44LE165. Three cupule fragments and 2 complete corn kernels were recovered from Feature 7, Stratum B.

Miscellaneous archaeobotanical materials recovered include 35 fragments of amorphous carbon residue and a single woody bud fragment (not taxonomically classified).

In addition to the materials recovered from flotation, four hand-collected charcoal samples from Feature 7, Stratum C were submitted for species identification. All carbon samples examined were composed entirely of wood charcoal. A total of 134.80 grams of charcoal were analyzed, revealing the presence of hickory *(Carya sp.)*, red and white oak *(Quercus sp.)*, and American chestnut *(Castanea dentata)* woods.

Summary

The sample of artifacts generated by this project is notable in terms of quantity, diversity, and quality. The sampled contexts allow a diachronic examination of culture change on a broad scale, as well as a close examination of site function and organization at a small campsite with a single cultural affiliation. The following chapter will discuss the implications of these findings in detail.

5 Research Summary and Conclusions

SITE STRUCTURE AND FUNCTION

Analysis of site structure focuses on the excavation results from Stratum IV-b in Test Units 19–30, where features and artifacts related to a small campsite dating to the transition from the Late Archaic to the Early Woodland period were identified (see Figure 9). Results associated with other cultural components in Stratum IV-a and the plowzone relate more closely to broad temporal changes in artifact assemblages.

LATE ARCHAIC/EARLY WOODLAND TRANSITIONAL COMPONENT

In the examination of site structure associated with this component in Test Units 19–30, several analytical approaches will be brought to bear. First, the spatial distribution of certain artifact types will be examined in relationship to other artifacts and in relationship to identified features to identify general activity areas. This analysis will be enhanced by the consideration of microdebitage recovered from flotation samples in each unit. Second, the results of edge-wear analysis conducted on selected tools will be incorporated to help identify specific activities more accurately. Finally, the archaeobotanical results from features will be consulted, primarily to address questions regarding the seasonality of activities at the site.

SPATIAL ORGANIZATION

Geomorphological and stratigraphic analysis indicates that the occupation resides on the second or upper terrace above Cane Creek (see Appendix B). Archaeological results demonstrate that the site is on the edge of a significant depression that existed at the time of the occupation. The six postmolds identified at the base of Stratum IV-b are located at what may represent a remnant of the western edge of this depression (see Figure 9). These posts appear to be arranged in two arcs of three posts: Arc 1 includes Features 6, 16, and 17, and Arc 2 includes Features 9, 8, and 15. Arc 2 posts are all about the same size and depth, with the concave side of the arc facing north; Arc 1 faces southwest and has a center post (Feature 16) that is notably deeper than the rest (see Figure 17). The distance between the outer posts in each arc is the same (1.25 m), and the spacing between posts in each arc ranges from 0.85 to 0.50 m. The proximity and similarity of the two postmold arcs suggests that they are roughly contemporaneous, although they may represent two camps within a relatively short time period. Functionally, they do not seem to be arranged in the form of a lean-to or a structure; rather, they appear to be support posts for some as yet unidentified activity. It is hoped that microwear analysis on tools in the vicinity will shed some light on the function of this set of features.

An important facet of the data recovery results is the recovery of very small debitage through flotation. Recent research has shown that the distribution of the microdebitage produced by lithic reduction, from less than 0.25 in. in size down to the microscopic level, can be used in conjunction with patterns of debitage and tool distribution to aid in the identification of lithic-related activity and disposal areas (Hull 1987; Stevenson 1985). Researchers studying the disposal habits of contemporary peoples have observed that small objects are discarded as primary refuse near their place of use or manufacture, whereas larger objects usually tend to be discarded away from the activity area as secondary refuse (Binford 1978; McKellar 1983). This model suggests that, at sites where lithic tool manufacture was carried out, microdebitage should be an important indicator of where lithic reduction took place. The small size of microdebitage prevents the clean-up, scavenging or reuse of these small materials, and limits the effects of postdepositional disturbances. Larger pieces of debitage are more likely to be subject to disturbances and secondary disposal.

In Test Units 19–30, six liter soil samples were collected from each excavated level in Stratum IV-b. A 6-liter soil samples from each of four excavated levels in Test Unit 24 was subjected to the flotation process, with a recovery focus on microdebitage. Level IV-b1 contained by far the highest quantity of microdebitage (n=57); subsequent levels contained only 9-14 pieces of microdebitage per six liter sample. Level IV-b1 also corresponds to the highest density of fire-cracked rock

Test Unit/ Level	Debitage <0.25 in.	Debitage >0.25 in.	Biface	Totals
19/IV-b2	102	7	0	109
20/IV-b1	75	0	0	75
21/IV-b1	64	7	0	71
22/IV-b2	73	4	0	77
23/IV-b2	72	5	0	77
24/IV-b1	57	3	0	60
24/IV-b2	9	0	0	9
24/IV-b3	9	0	0	9
24/IV-b4	14	0	0	14
25/IV-b1	62	1	0	63
28/IV-b1	34	0	0	34
29/IV-b1	51	4	0	55
30/IV-b1	67	3	1	71
Total	689	34	1	724

Table 29. Site 44LE165, Block B, Test Units 19-30, artifact types recovered from 6-liter flotation sample.

in Test Unit 24 (7.5 kg), with subsequent levels containing only 0 to 2.1 kg. Based on these results, the level with the highest density of fire-cracked rock in the remaining test units was chosen for flotation for microdebitage recovery. In every case except Test Unit 22, this also corresponds to the highest artifact density in each unit. These flotation results are presented in Table 29, and plotted in Figure 28. Lithic reduction activities appear to be concentrated generally close to the edge of the sinkhole/depression, with a strong focus in Test Unit 19 and two minor "stations" north and northeast of the hearth. These areas represent the primary focus of lithic reduction activities during the occupation.

Artifact density per unit volume (*not* including flotation results or miscellaneous/unmodified stone) is illustrated in Figure 29. This plot serves to define the general activity area of the occupation, the most intensive portion of which lies south and southeast of the post features. Test Unit 25 has the lowest artifact density at 42/m³, while Test Units 19, 21, and 30 have by far the highest densities, ranging from 823 to 861/m³ (Table 30).

Figure 28 illustrates the density distribution of microdebitage, fire-cracked rock, bifaces, informal tools, cores, and hafted bifaces. Fire-cracked rock, while recovered in all test units, is strongly focused in Test Unit 30 and, to a lesser degree, in Test Unit 21 in the vicinity of the postmold features. The concentration in Test Unit 30 is so distinctive that it will be referred to as the remnants of an informal hearth (Feature 18). The minor concentration to the northeast is intriguing, since it may provide some insight into the function of the post features. This understanding may be further enhanced by the analysis of the dark organic residue visible on one of the pieces of fire-cracked rock in Test Unit 21; the feasibility of such an analysis is currently being explored.

A total of 27 cores and core fragments were recovered across the block, but primarily in Test Unit 19 east of the hearth (see Figure 28). The use of random cores (n=8) is clearly favored over other types such as bifacial (n=3), lamellar (n=2), and bipolar (n=1). Core fragments (n=12) are found everywhere in the block, but mostly in Test Units 19 and 31 (67%, n=8). Random cores can be found in nearly every unit as well, but other types are clustered in Test Units 19 and 30. None of the cores found in Test Unit 30 with the hearth exhibit signs of thermal alteration, while several on the periphery of the hearth area are heat altered (mostly core fragments).

The highest density of hafted bifaces is in Test Unit 30 (8/m³), where the Feature 18 hearth is thought to have been located (see Figure 28). Of the seven hafted bifaces in this unit, six of them are miscellaneous/unidentified fragments and one is the(broken) Hardaway Corner-Notched hafted biface dating from the Paleoindian period. Since only one fragment of all these tools has been thermally altered, it seems that the disposal of these pieces occurred either before or after the hearth was used. In contrast, all of the hafted bifaces in the adjacent Test Unit 19 exhibit signs of thermal alteration. Those unaltered hafted bifaces in the vicinity of the hearth may be the result of discard after use, while the heat-altered hafted bifaces elsewhere may represent pieces that were broken during refinement or reworking of the tool after it had been heated. Identifiable, diagnostic hafted bifaces such as the Lonesome Pine, Gypsy, and Swannanoa types are all found north and east of the hearth. Four of the hafted bifaces from Test Units 19, 21, and 23 (including two Lonesome Pine hafted bifaces, an unidentified Late Archaic hafted biface, and an unidentified Archaic hafted biface) were submitted for microwear analysis. All of these points exhibit damage suggesting that they were used as projectile points; two of the points have been resharpened, and one exhibits hafting traces. These results indicate that there was a return to the this camp after a hunting foray, and attempts were made to salvage and restore damaged projectile points. No microwear traces were

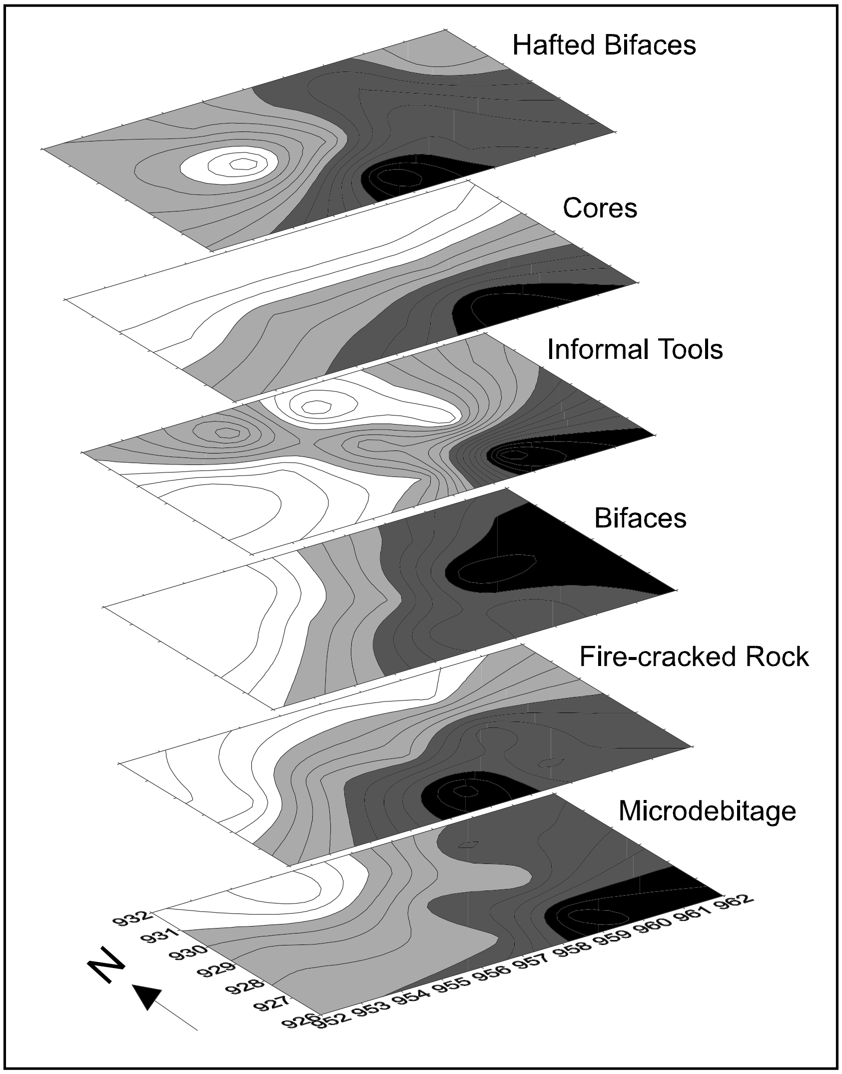


Figure 28. Site 44LE165, Block B, Stratum IV-b, density distribution plots of microdebitage, fire-cracked rock, bifaces, informal tools, cores, and hafted bifaces per unit volume.

detected indicating these tools were used as other than projectiles.

Bifaces exhibit a slightly different distribution than the hafted bifaces (see Figure 28). The highest density of "unfinished" bifaces is in Test Unit 21 (12/m³) in the vicinity of the postmold features. Early and late stage bifaces are relatively uncommon; Stage 2 (43%, n=20) and Stage 3 (37%, n=17) comprise most of the biface assemblage. The Stage 1 and 2 bifaces are mostly clustered in the work area immediately around the hearth, while Stage 3 bifaces have a more scattered distribution (Figure 30). This suggests that early stages of the reduction sequence took place primarily around the hearth, where the microdebitage is heavily concentrated, while later stage reduction and finishing occurred both around the hearth and elsewhere. Six of the unfinished bifaces were submitted for microwear analysis (including a Stage 3 and a Stage 4 from Test Unit 22, a Stage 3 from Test Unit 23, a Stage 3 and a Stage 4 from Test Unit 30, and a Stage 3 from Test Unit 20). None of these bifaces exhibit any microwear that would suggest that they had been used as scraping or cutting tools. A Stage 3 biface in Test Unit 23 exhibits small patches of hide polish that may represent hafting traces, along with damage characteristic of use as a projectile; this biface may have been broken, resharpened, hafted, and used as a projectile, similar to the manner described for the used hafted bifaces above. It is unclear whether the fractures exhibited by a Stage 4 biface in Test Unit 22 are manufacture or use related; no hafting traces or microwear is present. The remaining four bifaces exhibit fractures characteristic of breakage during manufacture (as opposed to breakage during use). Overall, it appears that the goals of the reduction sequence were hafted bifaces, since none of the late stage bifaces exhibit signs of alternative uses, such as butchering or hide-working. The one biface that exhibits clear use-related fractures was reworked for use as a projectile, in much the same manner as the attempts to recycle damaged hafted bifaces.

Only three other formal tools were identified, so they do not appear in a distribution density plot. A hafted endscraper was recovered just north of the hearth, and an endscraper was recovered in the high microdebitage area east of the hearth. The other endscraper was recovered north of the postmold features; both of the endscrapers were heated. Most of the tools exhibiting signs of thermal alteration were found north and east of the hearth, not in the hearth itself (Figure 31), suggesting that these tools were purposefully heat-altered for manufacturing or use purposes, rather than simply heated when they were tossed in the fire. All three of these tools were submitted for microwear analysis. Neither of the endscrapers exhibit microwear traces, and do not appear to have been used. The hafted endscraper from Test Unit 23, however, exhibits microwear traces that suggest it was being used as a hide scraper, documenting very limited hide preparation activities for the Late Archaic/Early Woodland component.

The highest density of informal tools is primarily focused in Test Unit 19 east of the hearth, but there is also a secondary focus on the northwest periphery of the activity area (see Figure 28). Most of these tools are retouched flakes (78%, =18) rather than the more expedient utilized flakes. When compared with the distribution of microdebitage, it appears that most informal tools were used near where they were made, with the exception of the secondary group of tools north and northwest of the hearth. This secondary tool-use station also contained three of the four heated informal tools, all retouched flakes. Ten of these 23 tools were submitted for microwear analysis; only three exhibit any signs of actual use. A utilized flake and a retouched flake recovered from Test Unit 23 northwest of the hearth exhibit microwear traces characteristic of skinning and butchering tools used for cutting and scraping meat or fresh hide. A notch in the utilized flake was also used to scrape bone or antler. A retouched flake recovered closer to the hearth in Test Unit 19 is also a cutting or scraping tool, but it was used to cut or shred plant material, or to scrape or cut a wooden object. Yerkes has suggested that the retouch on flakes that exhibit no signs of use wear may actually represent edge damage from "spontaneous retouch" that can occur when the edges of flakes strike the blanks they are being detached from (see Appendix D). This idea is certainly consistent with the high density of retouched flakes in Test Unit 19, where much of the biface reduction (and related microdebitage evidence) was identified. With the three informal tools that were used, we have very limited evidence of scraping meat or fresh hide, scraping bone or antler, and scraping plant material or a wooden object.

The density distribution of debitage types is shown in Figure 32. Primary/reduction flakes are somewhat surprisingly concentrated in the same area as the microdebitage; usually, primary debitage is larger, and most models suggest that larger debitage is often "tossed" away from the work station. It may be that the person conducting the lithic reduction changed position during the activity, a site dynamic not often considered in models of camp reconstruction.

Test Unit/ Level	Dimensions (m)	Vol. (m^3)	Artifacts (n)	Density (n/m^3)
19*/IV-b	$3m^2 \times 0.280$	0.840	723	861
20/IV-b	2 × 2 × 0.146	0.584	214	366
21/IV-b	2 × 2 × 0.194	0.776	639	823
22/IV-b	2 × 2 × 0.184	0.736	443	602
23/IV-b	2 × 2 × 0.282	1.128	667	591
24/IV-b	2 × 2 × 0.196	0.784	257	328
25/IV-b	2 × 2 × 0.102	0.408	42	103
26/IV-b	2 × 2 × 0.116	0.464	NS	-
27/IV-b	2 × 2 × 0.112	0.448	NS	-
28/IV-b	2 × 2 × 0.152	0.608	128	211
29/IV-b	2 × 2 × 0.138	0.552	257	466
30/IB-b	2 × 2 × 0.210	0.840	716	852

NS=not screened

* Feature 7 comprised approx. 1 m^2 of area in Test Unit 19; volume for Test Unit 19 is therefore based on *estimated* area.

Table 30. Site 44LE165, Block B, Test Units 19-30, Stratum IV-b, artifact density per unit volume exavated (not including flotation).

Assemblage and Activities

The Late Archaic/Early Woodland Transitional period assemblage from Stratum IV-b in Test Units 19–30 describes a small, specialized, short-term encampment on a small tributary terrace that utilized locally available materials around an informal hearth.

Table 31 summarizes several characteristics of the artifact assemblage from this context. Lithic reduction activities are obvious, with debitage, cores, broken tools, and unfinished forms identified. The endscrapers are the most specialized tools recovered, and even these are reworked from hafted bifaces. One of them had been used as a hide scraper. Some hunting activities were probably based here as well, based on the recovery of both complete and recycled hafted bifaces. Overall, the assemblage is rather generalized, with several hafted biface types, but few specialized tools. The use of lithic tools seems to be very focused on the production of projectile points for hunting, whether as the end result of the reduction sequence or while refurbishing damaged projectiles after the hunt. While there is evidence for butchering, hide preparation, and woodworking, the evidence is extremely sparse, and does not seem to constitute one of the primary site activities. The function of the post arcs is still unclear; since microwear evidence exists for hide scraping, it may be that these posts served to hold or stretch the hide during scraping.

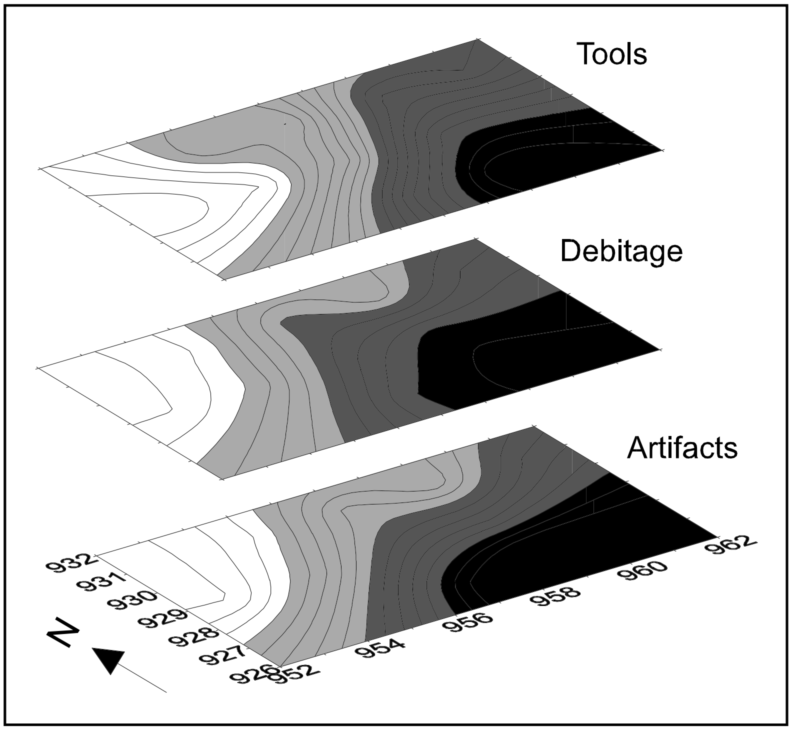


Figure 29. Site 44LE165, Block B, Stratum IV-b, density distribution plot of artifacts, debitage, and tools per unit volume.

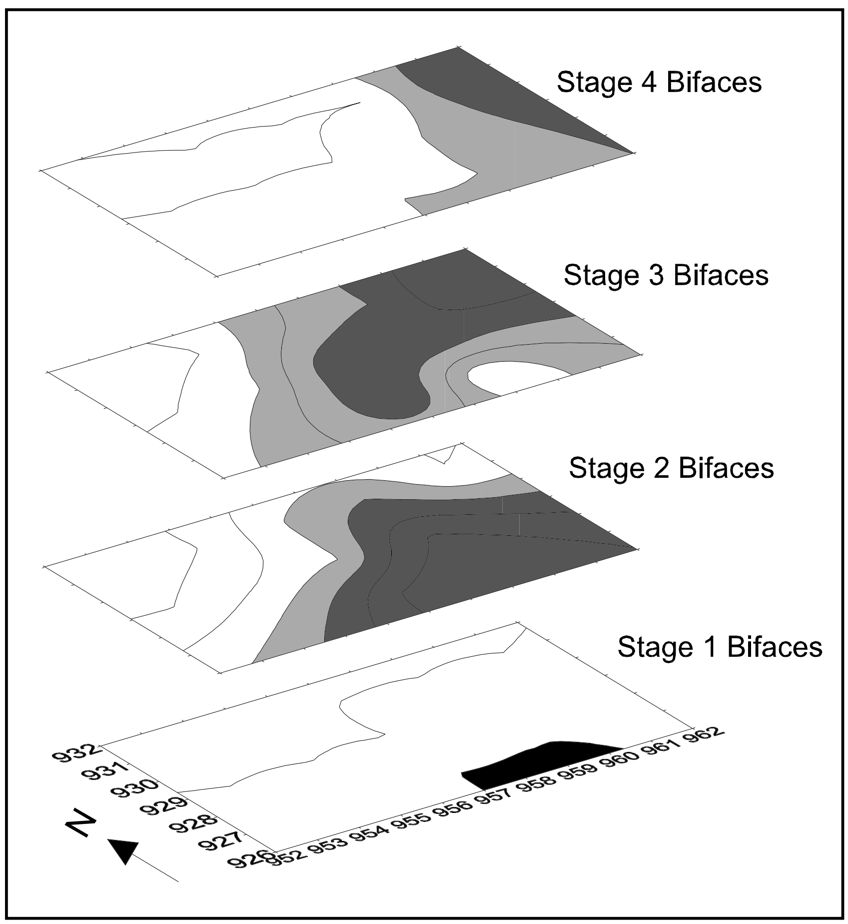


Figure 30. Site 44LE165, Block B, distribution of unfinished (staged) bifaces.

Summary

The overall picture is one of a tightly focused camp that included six posts, a large, informally gathered hearth, and possibly a smaller, secondary hearth associated with the posts. Activities included biface reduction from core materials and the manufacture of projectile points, heat treatment of tools and reduction materials, and the repair and maintenance of damaged projectile points or recycling of the points into endscrapers; microwear analysis also provides some evidence for butchering, hide preparation, and woodworking activities. Formal tools were produced close to the hearth in the biface reduction stations, but used two to four meters from the hearth. Informal tools were generally found close in the reduction station east of the hearth, where they were easily obtained during reduction activities, but were also used in an area further west of most of the site activities. Cores and early stage bifaces are clustered close to the hearth and the microdebitage focus, but later stage bifaces were discarded in several places around the camp. The presence of much earlier Kirk and Hardaway hafted bifaces may suggest an earlier component, but it is also possible that these were recycled items recovered elsewhere and used on-site, much like the repaired projectile points.

The occupation represents an intermediate procurement camp in the settlement and subsistence system of the Late Archaic/Early Woodland transitional period in the Powell Valley. Most of the evidence recovered points towards a temporary field camp for hunting activities, where a small group would return to conduct toolkit maintenance and manufacture, as well as any necessary preparation of carcasses and hides prior to a return to a larger base camp. Another part of this settlement system may have been identified at Site 44LE232, located further west in the Powell Valley (Jones 1998). This site represents a kill site, a structurally very small and ephemeral site near where an animal was killed. Microwear analysis of the tools form this site demonstrated that much of the initial butchery and preparation for transport was done at this informal, extremely short-term site. No date could be obtained for this kill site, but if similar sites were used during the Late Archaic/Early Woodland transitional period, we can hypothesize that 44LE165 represents an intermediate hunting site where the field-prepared carcass from a site like 44LE232 was brought for further processing of the meat and hide. Under such a logistical model, we might expect only a minor amount of butchery activities at 44LE165, with a more intensive focus on toolkit maintenance and hide preparation, and also a more formally organized (but still rather impermanent) site structure. Furthermore, while site structure would be more formalized than a kill site, it would likewise be more generalized and less permanent than a base camp, with a limited range of activities leaning more towards specialized procurement activities (e.g., hunting) than domestic activities.

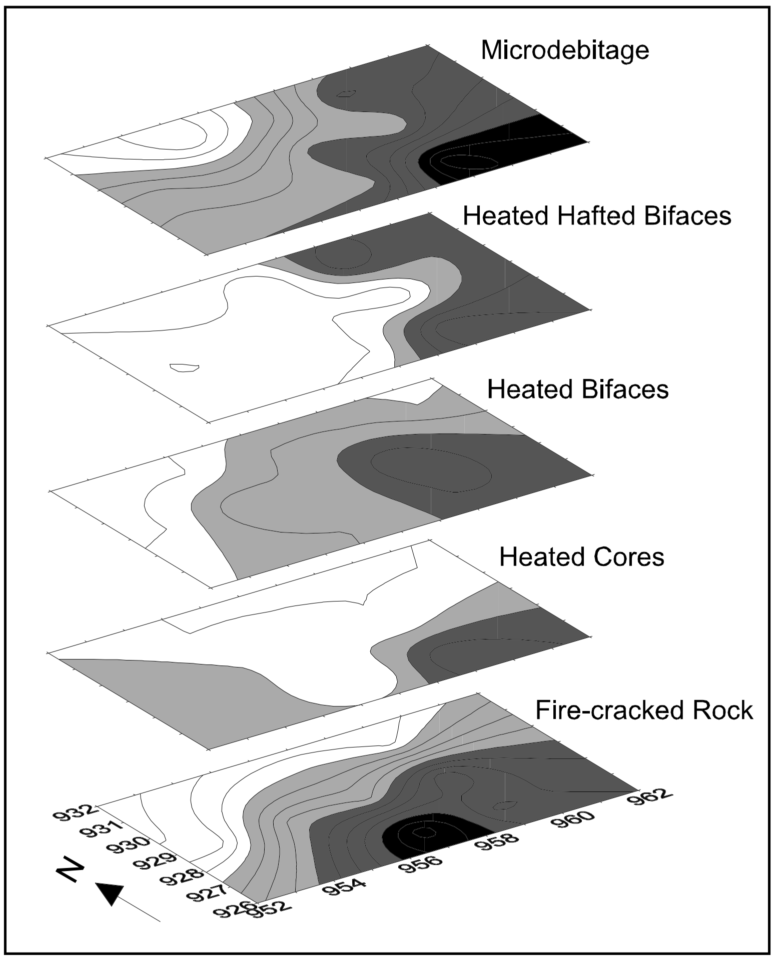


Figure 31. Site 44LE165, Block B, distribution of microdebitage, fire-cracked rock, and heated cores, bifaces, hafted bifaces per unit volume.

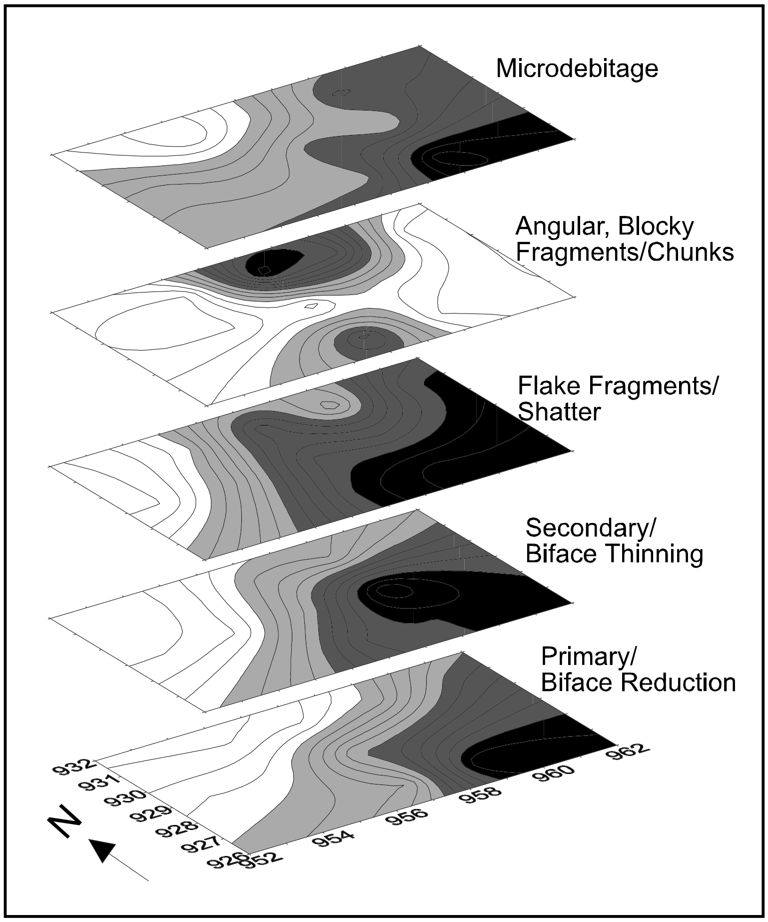


Figure 32. Site 44LE165, Block B, distribution of debitage types per unit volume.

LATE ARCHAIC/EARLY WOODLAND TRANSITIONAL (STRATUM IV-B)

– a variety of hafted biface types (Lonesome Pine, Swannanoa, Gypsy, Otarre)
– no ceramics
– low frequency of informal tools
– random cores
– few specialized tools (endscrapers)
– all stages of biface reduction
– frequent thermal alteration of tools
– several tested cobbles/nodules
– recycling/repair of damaged projectile points
– limited microwear evidence for butchering, hide preparation, and woodworking

MIDDLE/LATE WOODLAND (PLOWZONE)

– limited hafted biface types (Small Triangular and Connestee)
– a few small sand-tempered ceramics (Middle Woodland Connestee?)
– a few small limestone-tempered ceramics (Late Woodland Radford?)
– informal tools common
– lamellar cores
– a variety of specalized tool types (graver/perforators, sidescrapers, axes, and drills)
– thermal alteration uncommon; mostly intermediate and late stage bifaces
– tested cobbles/nodules generally not found

Table 31. Site 44LE165, assemblage characteristics by cultural component.

Middle/Late Woodland Component

Assemblage, Activities, and Summary

The plowzone represents exclusively Middle and Late Woodland contexts on both the upper and lower terraces. The tool variety is greater in this context than any other, including such tools as an endscraper, graver/perforators, a drill, a sidescraper, and a grooved axe fragment in addition to informal tools such as retouched flakes, utilized flakes, and informal ground stone tools (see Table 31). While it appears that a slightly wider variety of chert resources is being exploited into the Middle and Late Woodland periods, this may in fact be related more to heat treatment practices than changes in the lithic procurement patterns. Data from 44LE165 suggest that thermal alteration of hafted bifaces was common during the Late Archaic/Early Woodland Transitional periods, but was less frequent in the reduction sequence by later groups; none of the Middle or Late Woodland hafted bifaces at 44LE165 have been heated. Based on the relationship of unidentified chert and thermally altered chert discussed in the previous chapter, a decline in the practice of thermal alteration probably affects the diversity of chert types that can be identified instead of being relegated to the unidentified chert category.

Middle and Late Woodland activities tended to utilize more informal tools like retouched and utilized flakes, reflecting a more expedient but, at the same time, more specialized tool assemblage. Most of the informal flaked stone tools are straight-edged in earlier contexts, but in Middle/Late Woodland contexts include some concave or combined concave/convex forms as well. This assemblage indicates a wider range of *possible* site activities, including biface reduction, hunting, hide, meat, and food preparation, and the manufacture of wood, leather, bone, and antler items. Evidence for most of these activities is circumstantial at best, and especially for manufactured items is based on the possible uses of a given tool rather than recovery of the manufactured items themselves. Microwear analysis was able to confirm that one tool, a sidescraper, exhibits microwear traces consistent with fresh hide or meat cutting and scraping.

Feature 7 revealed important information concerning late Middle Woodland/early Late Woodland settlement at the site. First and foremost was the recovery of corn kernels and cupule from the flotation sample, and the two associated radiocarbon dates from ca. AD 780 to 1000. This is consistent with dated maize contexts west of the fall line in the mid-Atlantic, for which the earliest dates are ca. AD 825–1000 (Dent 1995:254). While other features at 44LE165 related to this occupation were no doubt lost or obscured by the alluvial and colluvial processes that created Stratum IV-a, it is clear that the late Middle Woodland/early Late Woodland occupation at 44LE165 does not represent a village. Rather, it appears to be comprised of hamlet-sized occupation or occupations, with the presence of a highly structured pit containing ceramics and maize suggesting a certain degree of permanence related to small-scale horticulture along Cane Creek. This is also consistent with the results of previous work in southwestern Virginia, which has found little or no evidence for larger, macro-social unit aggregation sites during the Middle Woodland (Blanton 1992). Furthermore, there have been no Middle Woodland components associated with the mound sites in southwestern Virginia (Egloff 1990). Even so, we have recovered evidence of maize horticulture at 44LE165 by the end of the Middle Woodland period. This evidence is associated with ceramics that are not part of the Middle Woodland Candy Creek/Long Branch ware type, but are more similar to the limestone-tempered Radford ceramics that eventually became prevalent across western and southwestern Virginia during the Late Woodland period. The results at 44LE165 suggest that localized, small-scale maize horticulture developed prior to the organization of the larger, nucleated villages of the Late Woodland period.

References Cited

Binford, Lewis R.
1978 Dimensional Analysis of Behavior and Site Structure: Learning from an Eskimo Hunting Stand. *American Antiquity* 43:330–361.

Blanton, Dennis B.
1992 Middle Woodland Settlement Systems in Virginia. In *Middle and Late Woodland Research in Virginia: A Synthesis*, edited by Theodore H. Reinhart and Mary Ellen N. Hodges, pp. 65–96. Special Publication No. 29. Archeological Society of Virginia, Richmond.

Callahan, Errett C.
1979 The Basics of Biface Knapping in the Eastern Fluted Point Tradition: A Manual for Flintknappers and Lithic Analysts. *Archaeology of Eastern North America* 7(1):1–179.

Chapman, Jefferson
1977 *Archaic Period Research in the Lower Little Tennessee River Valley.* Department of Anthropology, University of Tennessee, Knoxville.

Dent, Richard J. , Jr.
1995 *Chesapeake Prehistory: Old traditions, New Directions.* Plenum Press, New York.

Egloff, Keith T.
1990 *Ceramic Study of Woodland Occupation along the Clinch and Powell Rivers in Southwest Virginia 1987*. Research Report Series No. 3. Reprinted. Virginia Department of Historic Resources, Richmond. Originally published 1987.

1992 The Late Woodland Period in Southwestern Virginia. In *Middle and Late Woodland Research in Virginia: A Synthesis*, edited by Theodore H. Reinhart and Mary Ellen N. Hodges, pp. 187–224. Special Publication No. 29. Archeological Society of Virginia, Richmond.

Gardner, William M.
1974 The Flint Run Complex: Pattern and Process during the Paleoindian to Early Archaic. *Occasional Publication* No. 1, Archaeology Laboratory, Catholic University, Washington, D.C.

Holland, C. G.
1970 *An Archaeological Survey of Southwest Virginia.* Contributions to Anthropology No. 12. Smithsonian Institution Press, Washington, D.C.

Hull, Kathleen L.
1987 Identification of Cultural Site Formation Processes through Microdebitage Analysis. *American Antiquity* 52(4):772–783.

Jones, Joe B.
1998 *Archaeological Data Recovery at Site 44LE232 associated with Section E24 of the Proposed Route 58 Project, Lee County, Virginia.* William and Mary Center for Archaeological Research, Williamsburg, Virginia. Submitted to the Virginia Department of Transportation, Richmond.

Kay, Marvin
1996 Microwear Analysis of Some Clovis and Experimental Chipped Stone Tools. In *Stone Tools: Theoretical Insights into Human Prehistory*, edited by George H. Odell, pp. 315–344. Plenum Press, New York.

Keel, Bennie C.
1976 *Cherokee Archaeology*. University of Tennessee Press, Knoxville.

Keeley, L. H.
1980 *Experimental Determination of Stone Tool Uses: A Microwear Analysis.* University of Chicago Press.

McKellar, J. A.
1983 *Correlations and Explanation of Distributions.* Atlatl: Occasional Papers No. 4. Department of Anthropology, University of Arizona, Tucson.

McLearen, Douglas C.
1991 Late Archaic and Early Woodland Material Culture in Virginia. In *Late Archaic and Early Woodland Research in Virginia: A Synthesis*, edited by Theodore H. Reinhart and Mary Ellen N. Hodges, pp. 89–138. Special Publication No. 23. Archeological Society of Virginia, Richmond.

Metz, Cara, Scott Hudlow, and Anna Gray
1993 *A Phase I Cultural Resource Survey of a Portion of the Proposed Route 58 Improvement Project, Pennington Gap and Dryden, Lee County, Virginia.* William and Mary Center for Archaeological Research, Williamsburg, Virginia. Submitted Virginia Department of Transportation, Richmond.

Oliver, Billy L.
1985 Tradition and Typology: Basic Elements of the Carolina Projectile Point Sequence. In *Structure and Process in Southeastern Archaeology,* edited by Roy S. Dickens, Jr., and H. Trawick Ward, pp. 195–211. University of Alabama Press, University, Alabama.

Peterson, Jane, and Stevan C. Pullins
1995 *Phase II Archaeological Evaluation of Nine Sites associated with the Proposed Route 58 Improvement Project.* William and Mary Center for Archaeological Research, Williamsburg, Virginia. Submitted to Virginia Department of Transportation, Richmond.

Pullins, Stevan C.
1993 *Phase III Archaeological Data Recovery for Mitigation of Adverse Effects to Site 44WS115 Associated with the Route 58 Coeburn Bypass Project, Wise County, Virginia.* William and Mary Center for Archaeological Research, Williamsburg, Virginia. Submitted to the Virginia Department of Transportation, Richmond.

Rappleye, Lauralee, and William M. Gardner
1979 *A Cultural Resources and Impact Area Assessment, Great Dismal Swamp National Wildlife Refuge, City of Suffolk, Chesapeake, and Nansemond Counties, Virginia.* Interagency Archaeological Services, Atlanta.

Riggs, Brett H.
1985 Dated Contexts from Watauga Reservoir: Cultural Chronology Building for Northeast Tennessee. In Exploring Tennessee Prehistory, edited by Thomas R. Whyte, C. C. Boyd, and B. H. Riggs. Department of Anthropology *Report of Investigations* No. 42, University of Tennessee, Knoxville.

Ritchie, William A.
1971 *A Typology and Nomenclature for Projectile Points.* Bulletin Number 384. University of the State of New York, Albany.

Stevenson, Marc G.
1985 The Formation of Artifact Assemblages at Workshop/Habitation Sites: Models from Peace Point in Northern Alberta. *American Antiquity* 50(1):63–81.

U.S. Geological Survey
1969 Ben Hur, VA quadrangle. 7.5-minute topographic series. Photorevised. USGS, Reston, Virginia. Originally published 1947.