TENNESSEE ARCHAEOLOGY

Volume 2 Fall 2006 Number 2

Tennessee Archaeology is published semi-annually in electronic print format by the Tennessee Council for Professional Archaeology.

Correspondence about manuscripts for the journal should be addressed to Michael C. Moore, Tennessee Division of Archaeology, Cole Building #3, 1216 Foster Avenue, Nashville TN 37210.

TENNESSEE ARCHAEOLOGY

VOLUME 2 Fall 2006 NUMBER 2

On the Cover: Ceramics from Linville Cave, Courtesy, Jay Franklin and S.D. Dean

EDITORS CORNER

Welcome to the fourth issue of *Tennessee Archaeology.* Since posting of the first issue electronically (August 13, 2004), over 2100 visitors have tapped that issue. The second issue (June 16, 2005) received almost 900 "hits" and the third issue has been visited over 350 times since posting on February 13, 2006. We hope this means that the articles are being tapped as useful resources by the interested public and scholars alike.

The editors are pursuing avenues to expand the visibility of the journal, including an application for an ISSN (International Standard Serial Number) from the Library of Congress. We are also evaluating the best fashion to have the journal indexed electronically for access in academic and other libraries. By the publication of the first issue of Volume 3, we will hope to see expanded awareness and use of the journal.

We take this opportunity to extend our thanks to the many scholars who have provided professional assistance with timely and thorough reviews of submitted articles. As always, our greatest thanks go to the contributing authors. We look forward to working with other colleagues over the next few months as we begin putting together Volume 3.

ERRATA

On page 2 of Volume 2, Issue 1, an incorrect citation was included in the references for the Editors Corner.

Incorrect Citation:

Smith, Kevin E. and Emily L. Beahm
2005 Castalian Springs (40SU14): A Mississippian Chiefdom Center in the Nashville Basin of Tennessee. Paper presented at the Southeastern Archaeological Conference, Nashville.

Correct Citation:

Smith, Kevin E. and Emily L. Beahm
2005 Castalian Springs (40SU14): A Mississippian Chiefdom Center in the Nashville Basin of Tennessee. Paper presented at the Southeastern Archaeological Conference, Columbia.

THE ARCHAEOLOGY OF LINVILLE CAVE (40SL24), SULLIVAN COUNTY, TENNESSEE

Jay D. Franklin and S.D. Dean

Linville Cave is more popularly known in upper East Tennessee as Appalachian Caverns. Salvage excavations were conducted at Linville Cave from late winter 1990 through spring 1991 by S. D. Dean as part of a commercial venture. This article presents a detailed overview of the archaeological record of Linville Cave and a new radiocarbon date. Prehistoric Native Americans intermittently used the cave vestibule as a late fall hunting and retooling camp during the early Middle Woodland into the Late Woodland period.

Appalachian Caverns (historically known as Linville Cave) is a large, extensive karst system near Blountville in Sullivan County, Tennessee. Confusion sometimes arises because there is a Linville Caverns across the state border in North Carolina, as well as an Appalachian Caverns in Virginia. The historic name is used because the site is listed as Linville Cave on the Blountville USGS topographic quadrangle, and on the site form submitted to the Tennessee Division of Archaeology (Figure 1).

Excavations in Linville Cave were conducted in response to construction efforts to develop the site as a commercial cave. The excavations revealed buried, intact cultural deposits spanning the Woodland period. Ephemeral historic deposits were encountered above the Woodland levels. Pleistocene faunal material was also recovered from the cave but is beyond the scope of this article.[1]

While Pleistocene fauna caves are very common in Sullivan County (see Corgan and Breitburg 1996 for an inventory), archaeological caves are not. In fact, very little archaeology in Sullivan County has been reported or published. Doug Jordan (1956) reported the find of a Clovis point not far from Linville Cave. There were several Early Archaic artifacts recovered from paleontological excavations at Baker Bluff Cave (Guilday et al. 1978). Extensive excavations by S.D. Dean at the Eastman Rockshelter yielded several reports (Faulkner 1982; Faulkner and Dean 1982; Manzano 1986). There are no other reported investigations of Native American use of sheltered sites in Sullivan County. The archaeology of Linville Cave therefore offers a unique opportunity to examine aboriginal cave use in the Holston Valley. This article describes the results of archaeological excavations in Linville Cave undertaken by S. D. Dean from December 1990 through April 1991.

Background

Linville Cave was named for two brothers who were among the first to take up residence during the early historic settling of Sullivan County. The Linville brothers were long hunters who often made extended journeys away from home, and these journeys apparently brought them into contact with Native Americans. Legend holds that one day the two encountered a “band of Indians” very near the cave mouth. During an ensuing skirmish, John Linville was mortally wounded, whereupon his brother carried him into the cave where he died upon a large rock (for some time it was said that he was buried in the cave). The name Linville Cave remained in use until 1988 when the cave became commercially

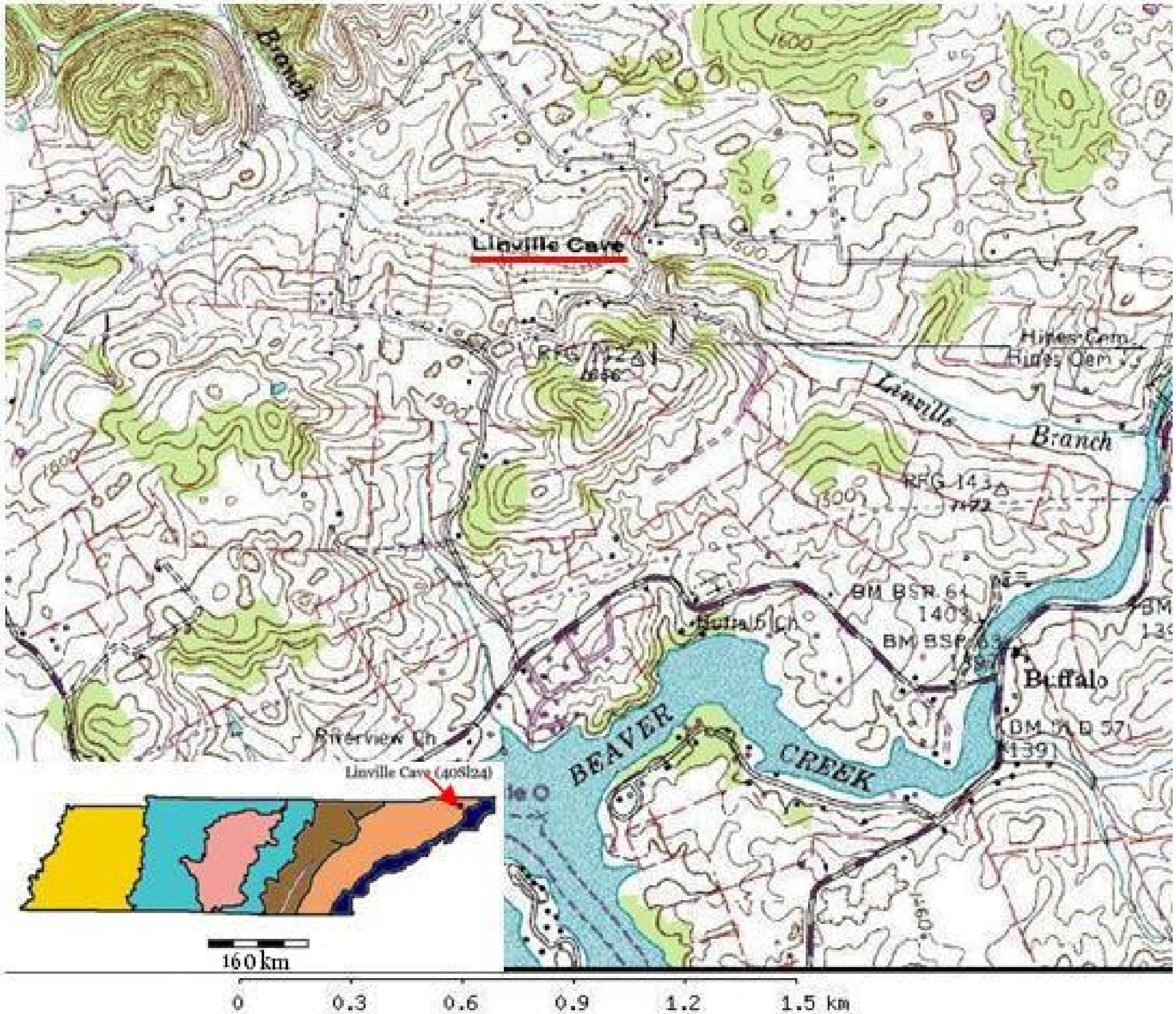

FIGURE 1. Location of Linville Cave (USGS Blountville TN/VA 7.5' Quadrangle, 197SE)

known as Appalachian Caverns. This well known cave has been the subject of several colorful legends (Holt 1967; Taylor 1909), including the presence of Icelandic inscriptions on the cave walls (Roger Hartley, personal communication, 2005). The authors examined the "inscriptions" and found them to be natural erosional features in the limestone.

Linville Cave was first systematically investigated by Gerard Fowke of the Bureau of American Ethnology in the early 1920s. Fowke (1922:124) describes the cave in great detail:

Apparently it is of great extent, for large sink holes connected with it are scattered over an area of several hundred acres. There are three principal openings. The largest is near the top of a knoll or low hill, and is due to falling in of the roof. The sunken part has an area of about 30 by 60 feet. Both ends of the cavern may be entered from the fallen rocks and earth. At one side the descent is precipitous and winding, over and among large fallen rocks. No level place is reached in daylight. At the other side the descent follows the natural dip of the strata and no level space can be found

FIGURE 2. Sinkhole vestibule entrance.

from which the entrance is visible. This part, also, is filled with rocks, large and small, from the roof and sides, and was never habitable.

In the end, Fowke (1922:125) concluded that "excavations would be difficult and useless."

Physiographic and Geologic Setting

Linville Cave is situated in the Ridge and Valley physiographic province of Tennessee (Figure 1). Often called the Great Valley of East Tennessee, the Ridge and Valley is an intermontane belt of parallel ridges and intervening valleys trending in a northeast-southwest direction for more than 320 kilometers (Amick and Rollins 1937). In Sullivan County, the Great Valley is approximately 64 kilometers wide, and bordered by the Unaka Mountains to the southeast and the Cumberland Plateau to the northwest.

The Ridge and Valley consists of rocks formed through sedimentary deposition during the Paleozoic Era. The deposits were laid down in a large geosyncline resulting in formations thousands of meters in thickness (Luther 1977). The sediments deposited in this trough, which later became the bedrock for Linville Cave, occurred during the Lower Ordovician, ca. 490-477 million years ago. Today this geologic horizon is recognized as the Kingsport Formation of the Knox Group (Barry Miller, personal communication 2004).

Geographically, Linville Cave is located approximately 433 meters AMSL. The cave entrance is about 3.7 kilometers southeast of the Blountville Courthouse at an elongated sink along Linville Branch (Barr 1961). The South Fork of the Holston River, now inundated by Boone Lake, lies 1.6 kilometers to the south. Linville Branch, which flows through the lower part of the cave, flows southeast into Beaver Creek 1.4 kilometers from the lower back entrance of the cave.

Linville Cave has three entrances, one on the upper level which trends southeast into the cave (91.4 meters in length) and two on the lower level (304.8 meters in total length). Linville Branch flows in and out of the cave by the lower two entrances (Barr 1961:436). All excavation at the site was limited to the sinkhole vestibule located on the upper level of the cave (Figure 2). This entrance faces southwest. Maximum dimensions are approximately 10 meters wide by 5.5 meters high.

Excavations

S. D. Dean first visited the cave in February 1967 and scraped some sediment from a large rock area just inside the cave entrance. He recovered three cord-marked ceramic sherds with limestone temper and tentatively assigned them to a Middle or Late Woodland cultural affiliation. Five faunal elements were sent to the Carnegie Museum in Pittsburgh and identified as modern bovine molar and four turtle carapace fragments (John Guilday, personal communication 1969).

Dean's interest in the archaeology of Linville Cave was renewed in November 1990 after learning the cave was being commercially developed. Contact with the cave's owners led to an agreement for Dean to excavate a portion of the cave's vestibule in order to examine the nature and extent of the archaeological deposits. Archaeological excavations at Linville Cave began in December 1990 and continued through April 1991. A northeast-southwest grid was established, and 38 1-m by 1-m squares were laid out to be excavated in arbitrary 10 centimeter levels (Figure 3). All sediments were dry screened through ¼" hardware mesh. An estimated nine tons of sediments were excavated and screened on site. An additional 1.5 tons of sediment and debris were water screened and processed away from the cave site.

The deepest excavation units reached 60 centimeters below surface, although archaeological remains were recovered only in the top 40 centimeters. Three features were recorded during the investigations. The feature fill was excavated by trowel and water screened. Bulk sediment samples from each feature were also taken for future analysis. Feature 3 contained a substantial amount of wood charcoal that was collected for potential radiocarbon dating.

Stratigraphy

The sedimentary deposits in the sinkhole vestibule of Linville Cave are almost exclusively the result of colluvial deposition from both inside (autochthonous) and outside (allochthonous) the cave. Atop the northeastern corner of Unit A8 is an overhead fissure (see Figure 3). Water from the ground surface outside the cave moving through the more ancient deposits in the overhead fissure is responsible for the Pleistocene deposits in the vestibule. Therefore, all of the recovered Pleistocene fauna was recovered in secondary position in the excavation block. The north wall of the vestibule contained colluvial material more than one meter thick. This material washed in from outside the cave but covered only a portion of the vestibule area to be excavated (ca. 30 centimeters). Erosion and tree root disturbance from the top of the overhang, six meters southwest

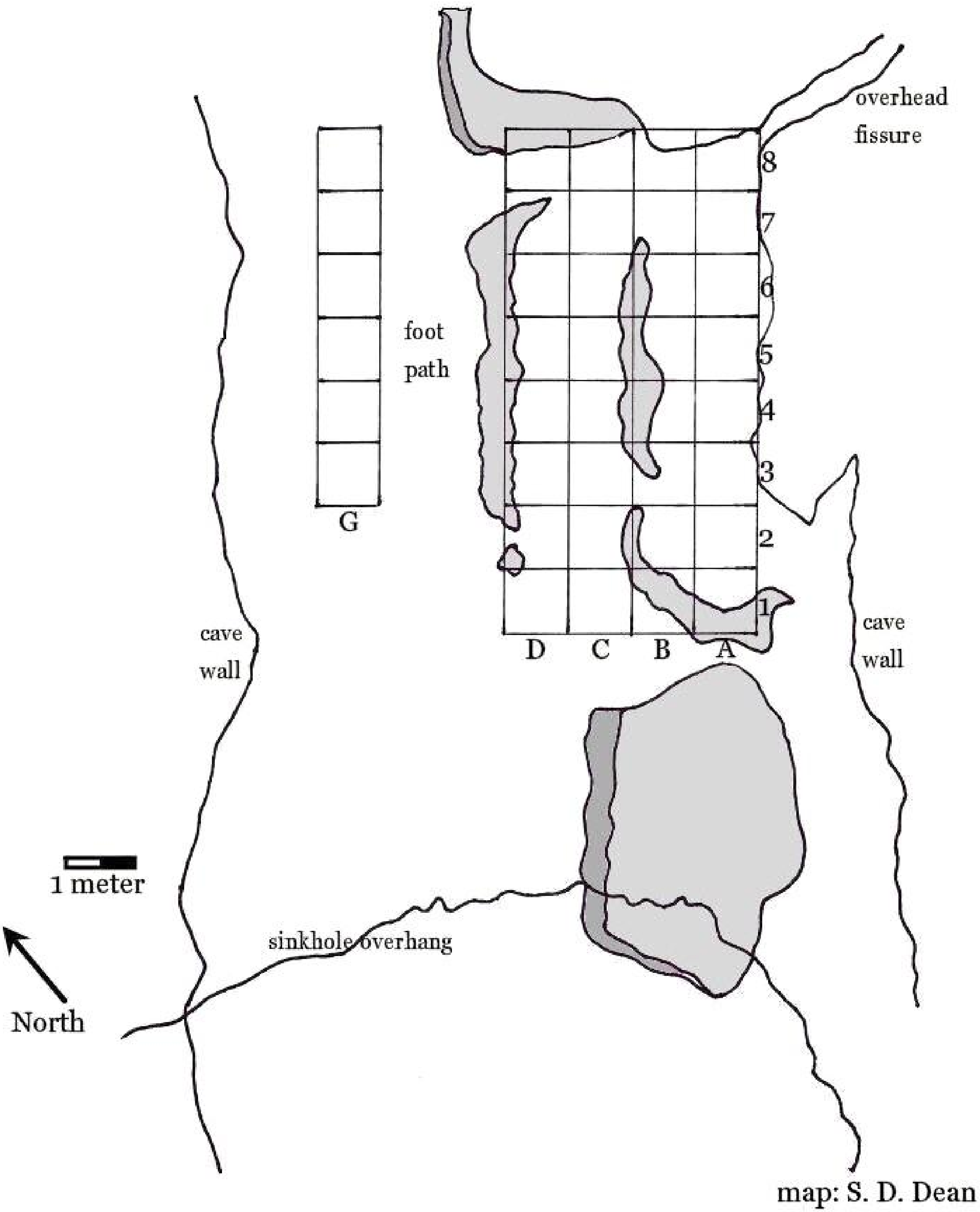

FIGURE 3. Plan-view of sinkhole vestibule showing excavation units.

of the excavation block, also released colluvium into the vestibule. These colluvial processes formed the two major strata in the cave's vestibule. These strata were further differentiated into eight substrata (Figure 4). Allochthonous colluvial de-

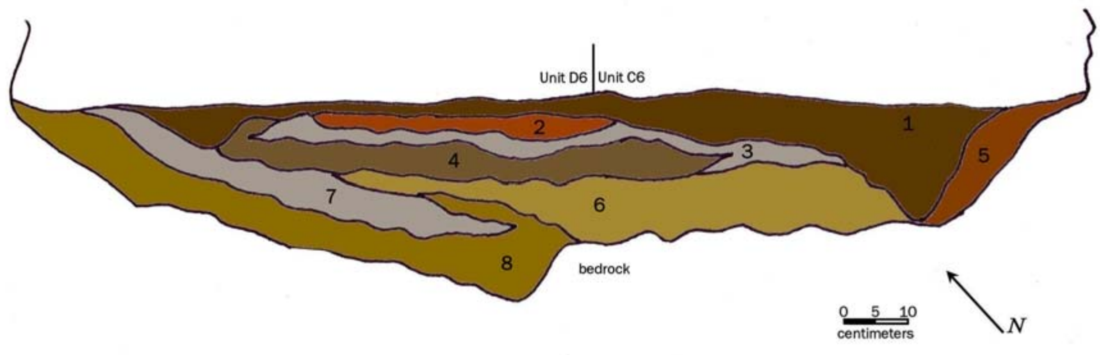

FIGURE 4. Profile of substrata in cave vestibule.

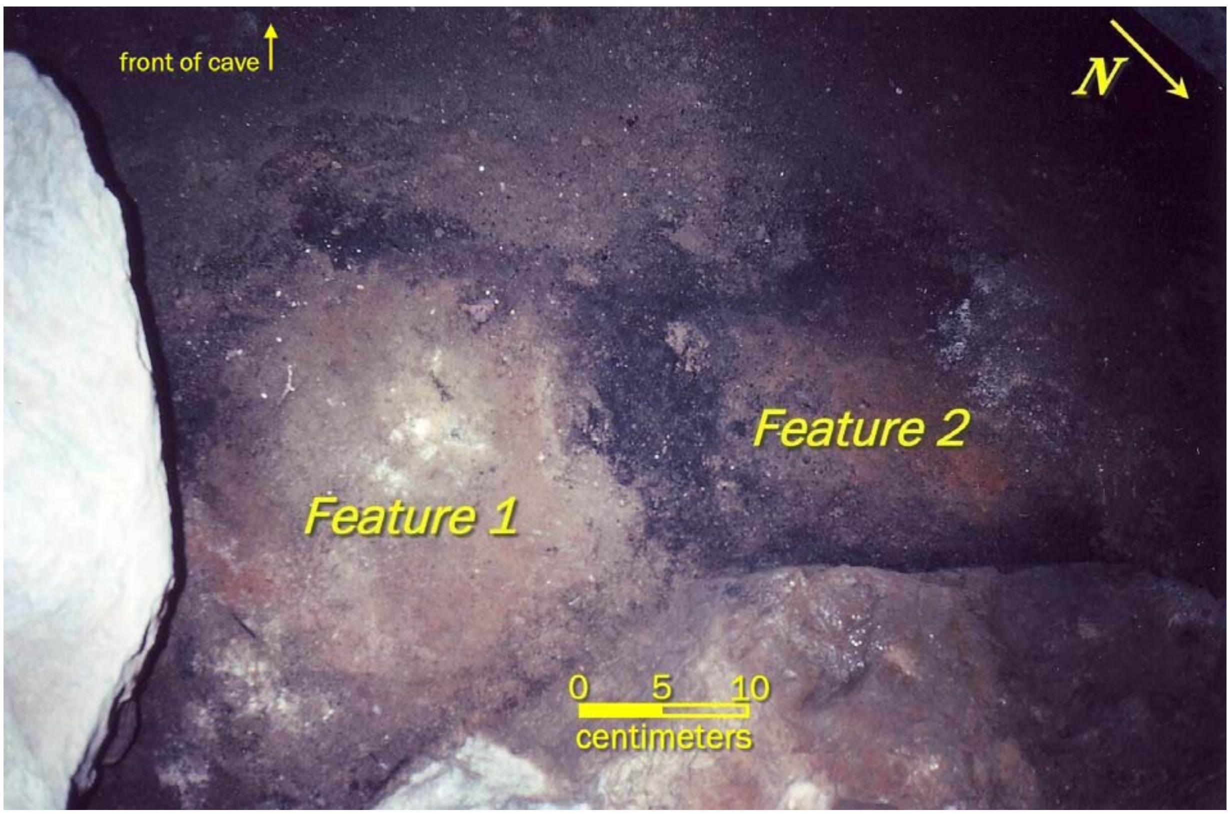

FIGURE 5. Features 1 and 2.

posits from outside the cave are represented by substrata 1, 4, 6, and 8. These typically brown-colored strata were in no place more than 15 centimeters deep. The archaeological materials were recovered from allochthonous colluvial substrata. The autochthonous colluvial deposits from within the cave are represented by substrata 2 and 5. These substrata were visually easily distinguishable from the allochthonous substrata. Further, all of the Pleistocene faunal remains were recovered from Substrata 2 or 5.

Two substrata, 3 and 7, were graycolored sediments that resulted from solution of the dolomite in the cave ceiling and walls precipitating into the cave floor sediments. Underneath the deposits removed by the archaeological excavations were two more ancient carbonate deposits. A section of the cave floor also underneath the excavation block revealed a laminar structure. Finally, beneath Units A8–D8 were rimstone dams that once held intermittent pools of water.

Archaeological materials from the cave vestibule (discussed below) were recovered from the top 30 centimeters of deposits. Deposition is therefore likely no older than about 3,000 years ago. Although no diagnostic artifacts were recovered from Level 4 anywhere in the cave's vestibule, sediment deposition in Level 4 is identical to that of Level 3. Therefore, it was probably not deposited much earlier than 3,000 years ago. With the exception of Feature 3, prehistoric Native American activities in the cave vestibule had little to no impact on the natural stratigraphy of the site. Late Pleistocene faunal remains were recovered from autochthonous deposits in Units A8, D6, and D8. Shovel testing in the overhead fissure above Unit A8 confirms this location as the source of the Pleistocene fauna recovered in the excavation block. Finally, with the exception of the ephemeral Features 1 and 2, there was evidence of stratified historic deposits in the cave.

Archaeological Features

Features 1 and 2 appear to be the result of modern historic activities (Figure 5). Local inhabitants have indicated that they are likely the remnants of small fires associated with the production of moonshine. These two features are consistent with numerous rock shelter moonshine still sites recorded on the Upper Cumberland Plateau in southeastern Kentucky (Tim Smith, personal communication, 2006).

Feature 3 was identified in Unit C3,

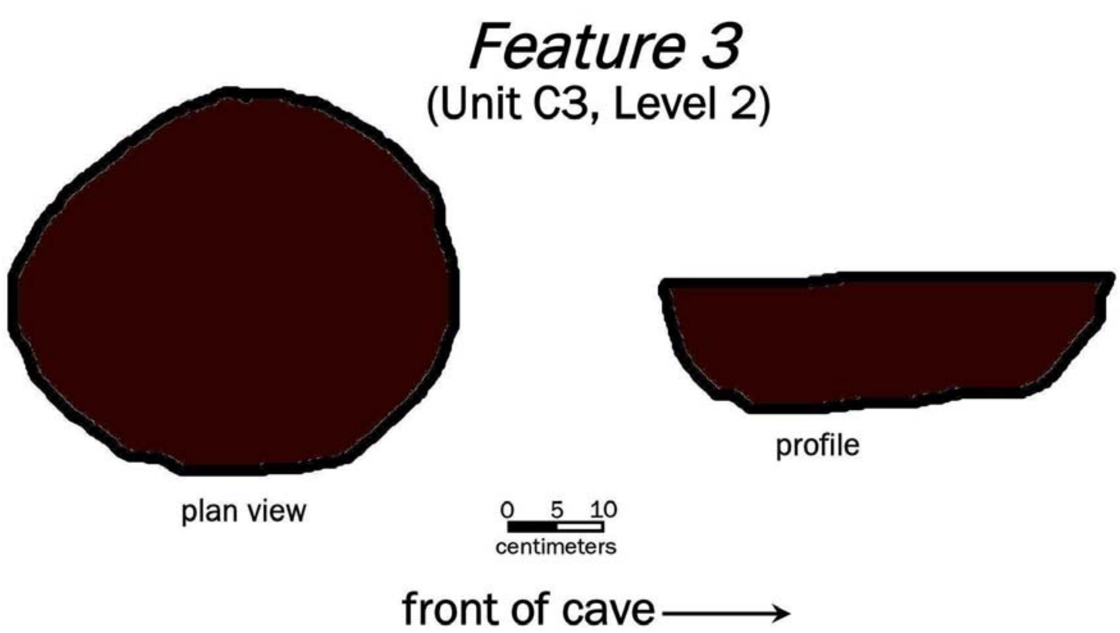

FIGURE 6. Feature 3 plan view and profile.

FIGURE 7. Faunal elements bearing cut marks.

Level 2 (see Figure 3). This roughly circular feature measured 45 centimeters in diameter and 13 centimeters deep (Figure 6). Feature 3 contained an abundance of wood charcoal, burned hickory nutshell fragments (n=8), burned mammal bones (n=17), burned limestone fragments (n=3), flaking debris (n=1), a biface (n=1), and prehistoric pottery sherds (n=25). Although most of the faunal material was unidentifiable, four specimens comprised white-tailed deer antler tine fragments. Two unidentified elements from nearby excavation units at the same level as Feature 3 exhibited stone tool cut marks (Figure 7).

Radiocarbon Date

A single piece of wood charcoal from Feature 3 was submitted to the NSF-Arizona AMS laboratory for radiocarbon dating. The resulting age assay was 1349 +/- 36 B.P. (AA-65705). At the 1-sigma level, the calibrated mean date is cal A.D. 675. The associated ceramics are consistent with the radiocarbon determination and will be discussed below.

Botanical Remains

Charred hickory nutshells were the most numerous botanical remains recovered in Linville Cave. Hickory was found in archaeological levels 1, 2, and 4 (Table 1.) Several hackberry seeds were also recovered. Their distribution in the archaeological levels is the same as for hickory (Levels 1, 2, and 4). Two walnut fragments were recovered from the (Early Woodland and early Middle Woodland) level 3. Numerous walnut remains were also recovered from levels dating to the same time at the Eastman Rockshelter (see Faulkner 1982; Faulkner and Dean 1982; Manzano 1986). Walnut may have been more important to early Woodland peoples, with later Woodland populations focused more on hickory and hackberry. However, as the botanical sample from Linville Cave was very small, much more data will be needed to assess this idea. Finally, one squash seed was recovered from Unit D2, Level 2 (Middle Woodland level).

TABLE 1. Botanical Remains.

Species	Provenience: Unit-Level
Hickory (*Carya* sp.)	C1-1, C2-2, Feature 3 (C3-2), D2-2, D3-4
Walnut (*Juglans* sp.)	D2-3, D3-3
Hackberry (*Celtis* sp.)	C2-2, C4-4, D2-1, D2-2
Squash (*Cucurbita* sp.)	D2-2

In sum, the paleobotanical remains suggest use of the cave's vestibule during the fall of the year. Hickory nuts are available from about late July through September. Walnuts typically fall somewhat later from about September well into October. Hackberry is normally available from about late September into November. Based on the botanical remains, it appears that Linville Cave was occupied in the fall intermittently throughout the Woodland period.

Faunal Remains

Of the 68 total levels excavated at Linville Cave, 63 levels contained faunal remains. All faunal remains were examined by the late Paul Parmalee simply to compile a list of species represented at the site. No quantitative analyses were conducted. Neither the Number of Identified Specimens (NISP) nor the Minimum Number of Individuals (MNI) methods were employed in the identification process. While a detailed level by level analysis and comparison of the faunal remains is therefore beyond the scope of this article, it is possible to discuss the species represented at the site. White-tailed deer, wild turkey, and black bear were the most typical game animals exploited by both prehistoric and historic Native Americans. It is no surprise then that these species are represented in all of the archaeological levels at Linville Cave (Table 2). Mammal remains represent the most numerous class of vertebrates at the site accounting for 64.3% of the identified specimens. Birds and reptiles account for 11.9% each. Fish remains make up 9.5% of the total, while amphibians represent the least numerous at 2.4%. In short, whether Early, Middle, or Late Woodland, the prehistoric inhabitants of Linville Cave exploited a wide array of the same types of species utilized by their contemporaries elsewhere in the Southeast (Table 2).

In addition to the Holocene species identified, Parmalee also identified seven mammal species characteristic of the Pleistocene in this region. Four of these mammalian taxa are now extinct, including the giant armadillo (*Dasypus* cf. *bellus*), mastodon (*Mammut americanum*), muskrat (*Ondatra annectens*), and dire wolf (*Canis dirus*). The three remaining mammalian taxa are only found far north or west of the site today. These include caribou (*Rangifer tarandus*), prairie vole (*Microtus ochrogaster*), and porcupine (*Erethizon dorsatum*). As previously mentioned, the Pleistocene faunal remains

TABLE 2. Faunal Remains.

Species	**Provenience (if identified)**
MAMMALS:	Unit-Level
White-tailed deer (*Odocoileus virginianus)*	A8-2, C2-1, C8-1, D8-2, D8-4, overhead fissure
Cervid indeterminate	C8-1, D8-5, G6-3, G8-2
Black bear (*Ursus americanus)*	A8-2, C8-1, D2-2, G6-3, overhead fissure
Opossum (*Didelphis virginianus)*	C1-1, C2-1, C3-1
Raccoon (*Procyon lotor)*	B8-1, D2-3, D8-5
River otter (*Lutra Canadensis)*	D8-5
Beaver (*Castor canadensis)*	A8-1, A8-2, C8-1, D2-3, D3-1, G8-2, overhead fissure
Bobcat (*Lynx* cf. *rufus)*	overhead fissure
Gray fox (*Urocyon cinereoargenteus)*	C4-3
Gray squirrel (*Sciurus carolinensis)*	D2-3
Woodchuck (*Marmota monax*)	A8-2, C4-1, C5-2, D8-3, D8-6
Eastern wood rat/pack rat (*Neotoma floridana*)	C8-1, D2-1
Eastern mole (*Scalopus aquaticus*)	D2-3
Hairytail mole (*Parascalops breweri*)	
Big brown bat (*Eptesicus fuscus*)	
Bat (*Myotis* sp.)	overhead fissure
Short-tailed shrew (*Blarina brevicauda*)	overhead fissure
Shrew (*Sorex* sp.)	
Pine vole (*Microtus pinetorum*)	
Red-backed vole (*Clethrionomys* cf. *gapperi*)	
Meadow vole (*Microtus pennslyvanicus*)	
Southern bog lemming (*Synaptomys cooperi*)	
Muskrat (*Ondatra zibethica*)	
Deer mouse/White-footed mouse (*Peromyscus* sp.)	
Chipmunk (*Tamias striatus*)	
Rabbit (*Sylvilagus* sp.)	overhead fissure
Horse (*Equus* sp.)	overhead fissure
Cow (*Bovidae* sp.)	
BIRDS:	
Wild turkey (*Meleagris gallopovo*)	
Duck (*Anas* sp.)	C2-1
Ruffed grouse (*Bonasa umbellus*)	overhead fissure
Chicken (*Gallus gallus*)	D2-1
Bird spp.	
REPTILES:	
Rattlesnake (*Crotalus* sp.)	C2-2
Snake spp.	
Box turtle (*Terrapene* sp.)	D2-3
Map turtle (*Graptemys geographica*)	C4-1
Musk turtle (*Sternotherus* sp.)	
FISH:	
Sucker (*Catostomus* sp.)	C8-1
Bass (*Micropterus* sp.)	
Redhorse (*Moxostoma* sp.)	C4-1
Minnow sp. (Family *Cyprinidae)*	D5-1
OTHER:	
Toad (*Bufo* sp.)	
Gastropod (*Mesodon profunda*)	
Pleistocene fauna:	
Caribou (*Rangifer tarandus*)	D8-5, D8-6
American mastodon (*Mammut americanum*)	D8-5
Dire wolf (*Canis dirus*)	overhead fissure
Giant armadillo (*Dasypus* cf. *bellus*)	A8-2
Muskrat (*Ondatra annectens* Irvingtonian)	D6-1
Prairie vole (*Microtus ochrogaster*)	overhead fissure
Porcupine (*Erethizon dorsatum*)	overhead fissure

were recovered from autochthonous colluvial deposits in the excavation block as well as in the sediments in the overhead fissure above Unit A8 (see Table 2).

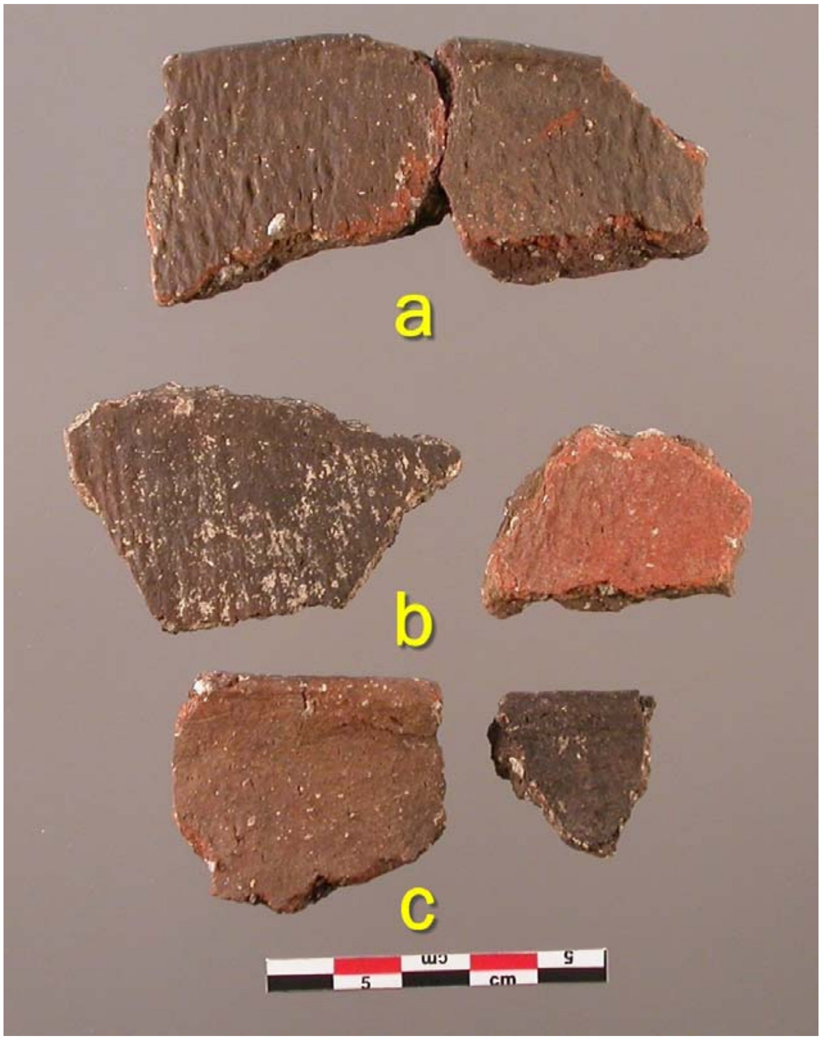

FIGURE 8. Limestone-tempered ceramics: a) Cord-marked rimsherd; b) Cord-marked body sherds; c) Smoothed-over, knot-roughened sherds.

Ceramic Assemblage

Most of the ceramics recovered from Feature 3 (n=25) are fine cord-marked with limestone temper (n=17) comparable to Candy Creek Cord Marked. An alternative interpretation is these ceramics may be part of the Radford Series. There are also smoothed over knot-roughened or fabric-marked sherds (n=2) from Feature 3 (Figures 8 and 9). Faulkner (personal communication 1991) stated, "the fabric-marked/knot-roughened sherds are questionable and do not fit any named type…, although perhaps there is a comparable Radford type." In point of fact, it is very difficult to make out the weave on these sherds, and Evans (1955:66) states, "Since the treatment in no way resembles impressions made by any of the fabrics normally distinguished under the fabric-impressed types, it is classified as a knotted fabric more closely related to netting than any other woven material." Fabric-impressed pottery typically characteristic of the Early Woodland (Long Branch), apparently persisted into the Middle Woodland in upper East Tennessee. Feature 11 at the Eastman Rockshelter contained Long Branch Fabric Marked pottery and yielded a calibrated early Middle Woodland radiocarbon date of A.D. 140 (Faulkner 1982:3). Additional radiocarbon dates from the Eastman Rockshelter will hopefully provide greater chronological resolution for fabric-marked pottery in upper East Tennessee in the near future. In any case, the sherds from Feature 3 at Linville Cave are consistent with a Middle and/or Late Woodland presence in Linville Cave.

All sherds recovered from excavation units and levels at Linville Cave are limestone tempered (n = 415). Of this particular sample, nine sherds have limestone and grit temper (Table 3). In terms of surface treatment, cord marking of some variation dominates the assemblage. Fine cord marking dominates in all levels. The

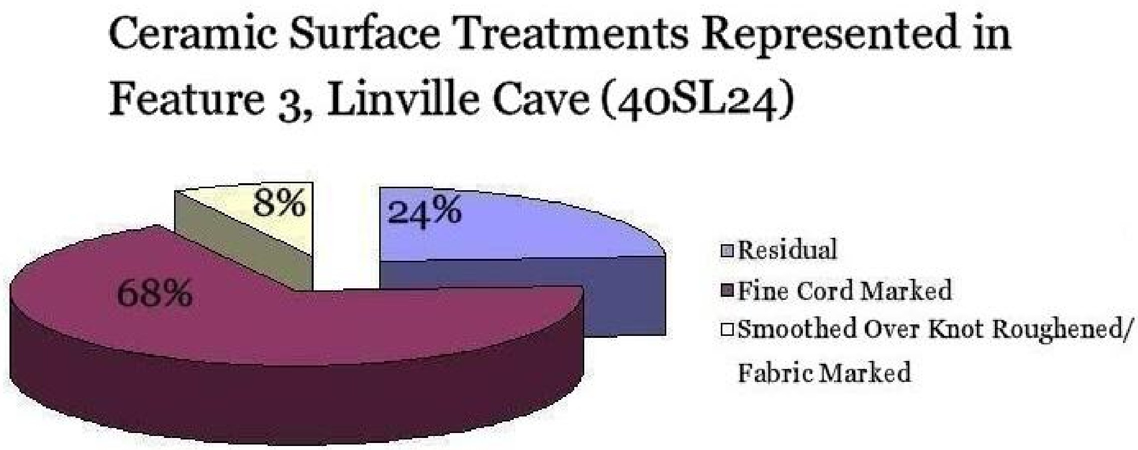

FIGURE 9. Ceramic surface treatments represented in Feature 3.

TABLE 3. Ceramics.

Pottery type by count	**Level 1**	**Level 2**	**Feature 3**	**Level 3**	**Level 4**	**Totals**
Limestone tempered:						
Residual	47	48	6	17	0	118
Plain	2	3	0	0	0	5
fine cord-marked	35	66	17	45	3	166
wide cord-marked	5	7	0	2	0	14
Smoothed-over cord-marked	4	4	0	1	0	9
knot-roughened/fabric	17	16	0	9	2	44
Smoothed-over knot-roughened/fabric	11	2	2	0	0	15
wide cord/fabric-marked	14	19	0	2	0	35
Limestone and grit tempered:						
wide cord/fabric-marked	9	0	0	0	0	9
Totals	144	165	25	76	5	415

knot-roughened/fabric-marked and wide cord/fabric-marked varieties, however, increase in frequency through time (Figure 10).

In short, Faulkner's preliminary assessment of the ceramic assemblage appears to be appropriate (personal communication 1991). The assemblage is fairly homogeneous with the earliest sherds (e. g., those from the lowest levels) being the thickest and later ones thinner. The ceramic assemblage likely spans a time range from A.D. 300 - 700. More than 80% of the ceramic assemblage was recovered in Levels 1 and 2 (including Feature 3). If the number of recovered sherds can be taken as a proxy of occupation intensity, it would appear that the late Middle Woodland was the time of the most intensive use of the cave's vestibule (e. g., closer to A.D. 700). The calibrated radiocarbon date of cal A.D. 675 from Feature 3 would seem to bear this out. Wright Checked Stamped pottery is absent at Linville Cave. This absence is curious given that Wright Check Stamped wares dominate other Middle Woodland sites in the region (e. g., Eastman Rockshelter and the Nelson site).

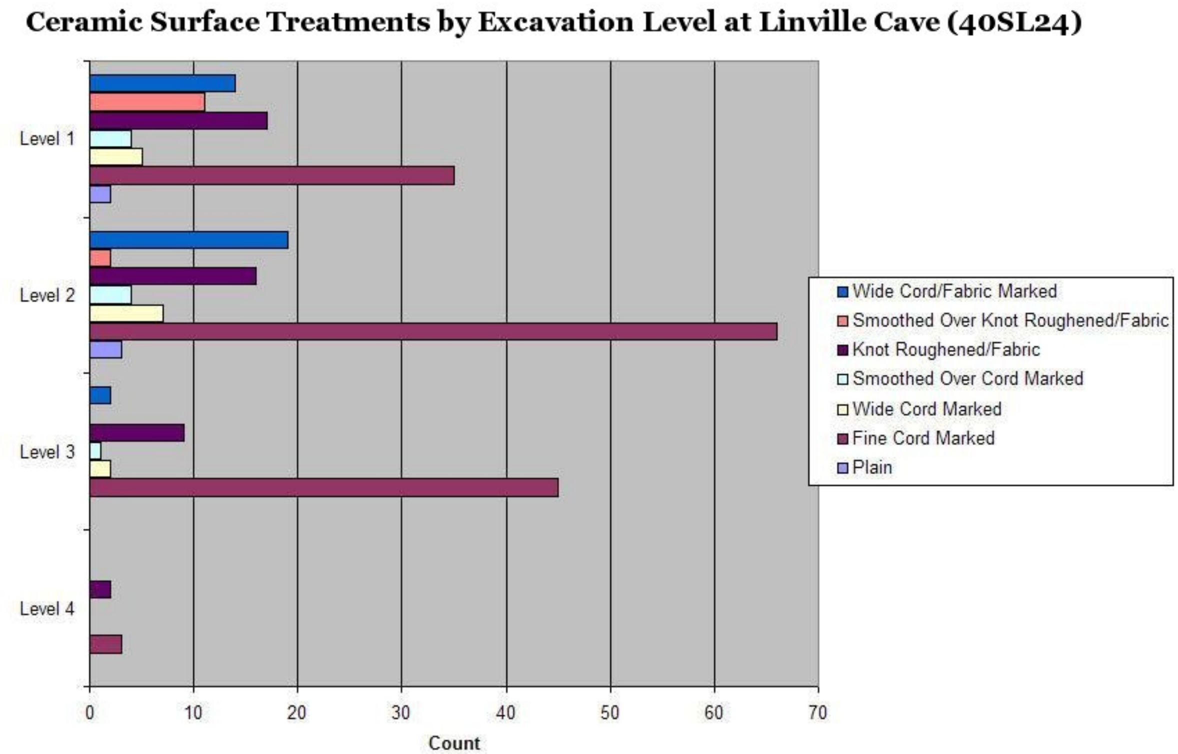

FIGURE 10. Ceramic surface treatments by excavation level.

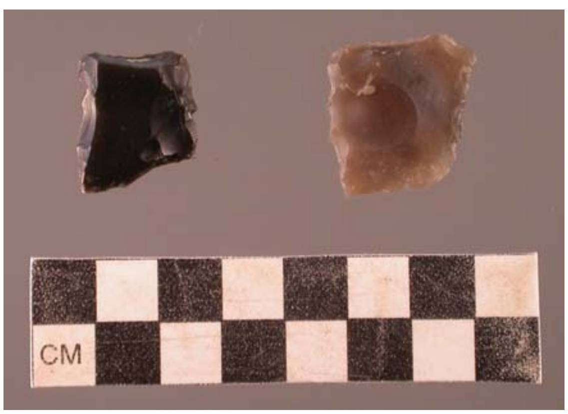

FIGURE 11. Gunflints. English (left) and French (right).

Lithic Analysis

The lithic assemblage from Linville Cave is homogeneous in terms of raw material. More than 96% of the assemblage is made up of ubiquitous and locally available Knox cherts. Very minor amounts of quartz and chalcedony were recorded in the flaking debris. All prehistoric stone tools were made from Knox cherts. A complete list of the lithic artifacts from Linville Cave is tallied in Table 4.

Of interest, but unrelated to the prehistoric archaeology of Linville Cave, was the recovery of two gun flints just below the surface of two different excavation units (Figure 11). One specimen is an English gun flint from the Brandon Quarries made using a snapped blade technique. This item, likely used for a rifle, is heavily spent. The second gun flint, made from French Cretaceous flint using a spall method, was likely used for a trade gun (perhaps a musket). This gun flint is also nearly spent.

Temporally sensitive prehistoric lithic artifacts span the Woodland period, and like the ceramic assemblage, there is very good stratigraphic sequencing. Two Early Woodland projectile point types

TABLE 4. Lithics.

Lithics by count	Level 1	Level 2	Feature 3	Level 3	Level 4	Totals
Flaking debris:						
1" (Size 5)	0	0	0	0	0	0
¾" (Size 4)	0	0	0	1	1	2
½" (Size 3)	7	7	0	6	4	24
¼" (Size 2)	77	94	1	49	19	240
⅛" (Size 1)	15	36	0	23	18	92
Totals	99	137	1	79	42	358
Cores/core fragments	3	1	0	1	0	5
Bifaces/biface fragments	1	3	1	0	0	5
Pieces esquilles/wedges	1	1	0	0	0	2
Historic gun flints	2	0	0	0	0	2
Madison ppks	4	3	0	0	0	7
Swan Lake ppks	0	3	0	0	0	3
Nolichucky ppks	0	0	0	1	0	1
Ebenezer ppks	0	0	0	1	0	1

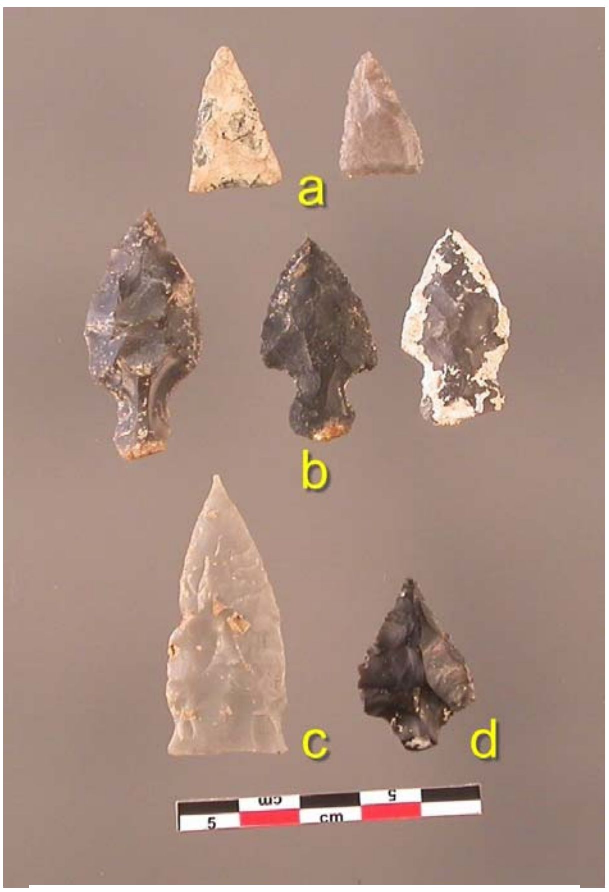

FIGURE 12. Projectile points: (a) Madison; (b) Swan Lake; (c) Nolichucky; and (d) Ebenezer.

(Nolichucky triangular point and an Ebenezer contracting stemmed point) were recovered from Level 3 during the excavations (Figure 12c, d). Triangular types, such as the Nolichucky, persisted into the Middle Woodland period as represented at the Possum Creek site in nearby Greene County (Franklin 1998:73-74).

In Level 2 across the excavations, three Middle Woodland Swan Lake points/knives were recovered (Figure 12b). These same types were recovered in Middle Woodland contexts at the Nelson site (40Wg7) in nearby Washington County on the Nolichucky River. Mac Mcilhany (personal communication, 2006) suggests that these may have been hafted using a socket method whereby the tool is fitted into the hollow end of a shaft made of river cane. This assumption is based in part on their often thick, unfinished bases. No use wear analysis has so far been conducted on our specimens to test this idea.

Several Madison points were recovered from levels 1 and 2 across the excavation units indicating the Late Woodland (Figure 12a). Again, the projectile points and the ceramics are consistent indicating use from the early Middle Woodland through the Late Woodland periods.

The lithic flaking debris was analyzed

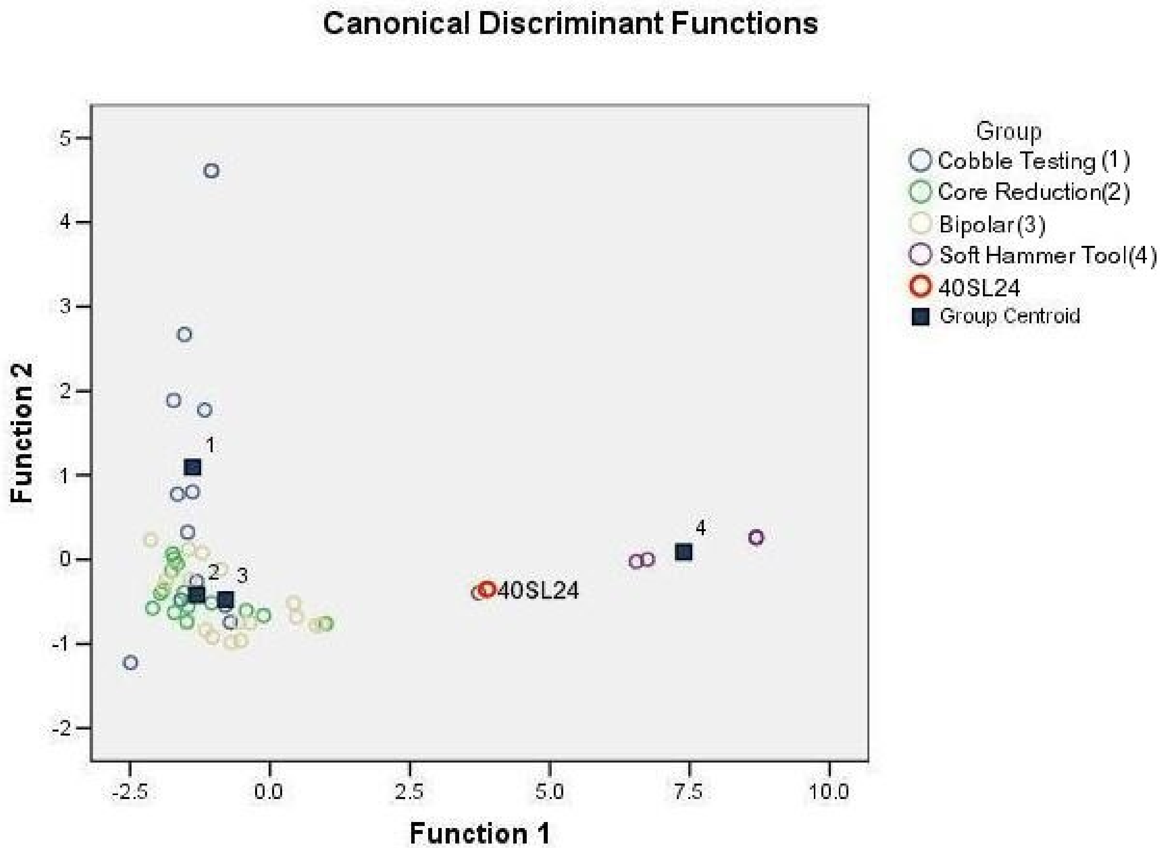

FIGURE 13. Mass-analysis discriminant function plot.

using two independent methods: Mass Analysis, as defined by Ahler (1989), and the Flake Debris Stage following Magne (1985). The material was sorted by level and analyzed first employing the mass analysis. In short, size grading of the lithic debris, consisting primarily of the distribution of counts and weights, suggested homogeneity of the flaking debris across all levels. Therefore, the flaking debris assemblage (n=266; Size 1 data was not included) was pooled and subjected to a discriminant analysis to determine the nature of lithic reduction at Linville Cave. The archaeological debris was compared to an experimentally generated assemblage. The Linville Cave lithic debris is categorized as representing soft hammer tool production (Figure 13).

Magne (1985:120) initially found that the number of platform facet scars on individual flakes was the most robust indicator of reduction stage. Subsequent experimental reductions by Bradbury and Carr (1995:108) have also shown that this is the case for early stage reduction, e. g., core reduction. However, their experiments suggest that the number of dorsal scars is the best indicator of late stage reductions, e.g., tool production. Given that the mass analysis strongly indicated that the Linville Cave assemblage is the result of soft hammer tool production, following Bradbury and Carr (1995), we used dorsal scar counts to further interpret the nature of the assemblage. The results indicate an emphasis on late stage reduction consistent with the mass analy-

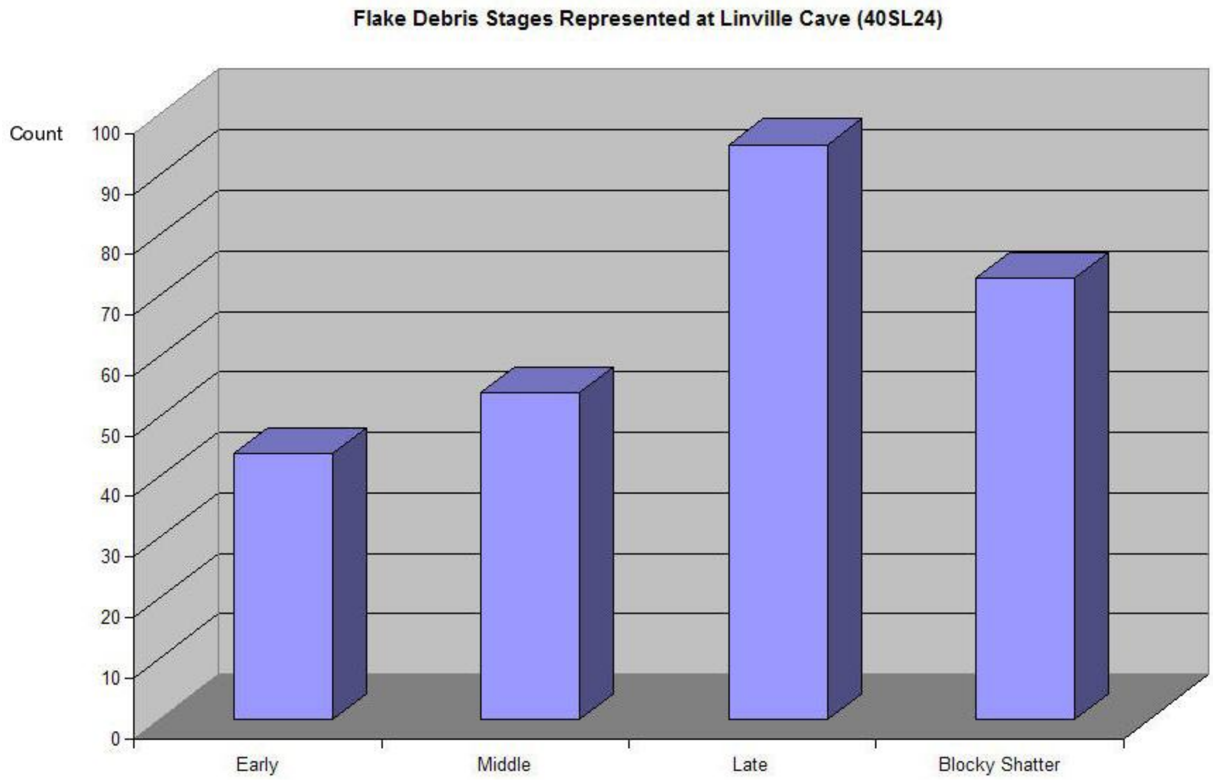

FIGURE 14. Flake debris stages.

sis (Figure 14). There is a significant amount of blocky shatter, but we believe this is largely due to the nature of the Knox cherts used (typically very small, rounded nodules) as the experimental assemblage also produced much blocky shatter

.

Discussion

The primary components represented at Linville Cave are the Middle and Late Woodland periods. Unfortunately, precious little is known regarding these periods in upper East Tennessee. McIlhany (1978) recorded a significant Middle Woodland component at the Nelson site (40WG7) on the Nolichucky River in adjacent Washington County. Middle Woodland artifacts recorded from 40WG7 include limestone tempered Candy Creek Cord Marked and Wright Check Stamped ceramics, and Swan Lake points as previously noted.

Two Middle Woodland components were recorded at the Possum Creek site (40GN52) on the Nolichucky River in Greene County (Kim 1998). The earlier component was associated with Greeneville Cluster points, limestone tempered (Mulberry Creek Plain and Wright Check Stamped) ceramics, and quartz tempered (Pigeon Plain and Check Stamped) ceramics (Kim 1998:100). Associated calibrated radiocarbon determinations were cal A.D. 20 and cal 80 B.C. (Franklin 1998:73-74). New Market points, limestone tempered Mulberry Creek Plain ceramics, and sand tempered Connestee Plain ceramics characterized the later Woodland component. One associated calibrated radiocarbon determination came out to be cal A.D. 725 (Franklin 1998:73; Kim 1998:102). The radiocarbon determination from the later component is statistically indistinguishable from the date from Linville Cave (cal A.D. 675). However, while both sites are likely contemporaneous, the ceramic assemblages are different. The projectile points are also different, but the New Market points often possess a thick unfinished base suggesting they may have functioned similarly to the Swan Lake points.

The Middle Woodland levels at Daugherty's Cave (44RU14) in southwestern Virginia are characterized by Mulberry Creek Plain, Wright Check Stamped, and Bluff Creek Simple Stamped, all limestone tempered wares. These types are much more typical farther south in the Great Valley of East Tennessee. An associated calibrated radiocarbon determination is cal A.D. 322 (Benthall 1990:26). Radford Series ceramics also occur in great frequency at Daugherty's Cave. The Radford Series is typically assigned a Late Woodland affiliation. However, Radford Series ceramics have been dated from good contexts at a number of sites in southwestern Virginia ranging from the late Middle Woodland through the late prehistoric/protohistoric periods (Benthall 1990:28). In this respect, they are much like Hamilton points in that they are not very sensitive chronological markers (e. g., Schroedl et al. 1985). At Daugherty's Cave, Radford ceramics occur stratigraphically with the abovementioned Middle Woodland types (e. g., limestone tempered wares more typical of East Tennessee), and Benthall (1990:28) has postulated that the Radford Series may have its origins in the Middle Woodland period. While the predominant limestone tempered ware at Linville Cave is (Candy Creek) cord marked, this ware may be associated with Radford ceramics (as previously discussed).

Finally, at Wagner Island in the Watauga Reservoir (Johnson County, Tennessee), two features from two sites are contemporaneous with the archaeological deposits at Linville Cave (Boyd 1986). Radford Series ceramics and Hamilton points were recovered from Feature 2 at site 40JN89 (Riggs 1985:176). Charcoal and nutshell from this feature was radiocarbon dated to cal A.D. 755 (Riggs 1985:171). Feature 1 at site 40JN90 contained a Hamilton point and limestone tempered Candy Creek Cord Marked pottery (Riggs 1985:176). Alternatively, the ceramics could be Radford Cord Marked (Evans 1955:67). Wood charcoal from this hearth feature yielded a calibrated radiocarbon age assay of cal A.D. 685 (Riggs 1985:175) making it roughly contemporaneous with Feature 3 at Linville Cave.

Middle Woodland ceramics were also recovered at Eastman Rockshelter (e. g., Wright Check Stamped), although analyses of the shelter artifacts are ongoing. The archaeological record of Linville Cave fits well with what we currently know of the Middle to Later Woodland in upper East Tennessee. We caution that much work and analysis remains to be done before a clear picture of this time period and the attendant cultural interactions can be discerned.

Conclusions

In sum, the archaeological assemblage from Linville Cave is rather small. The vestibule appears to have been used intermittently as a short term camping location. Based on the botanical remains, site occupation was likely during the fall of the year. Activities at the cave included the butchering of mammal remains as evidenced by stone tool cut marks on several bones. The lithic analysis indicates that technology at Linville Cave consisted of gearing up activities such as tool manufacture and resharpening. Diagnostic ceramic and lithic artifacts, along with one calibrated AMS determination of cal A.D. 675, indicate that these activities took place during the early Middle Woodland and into the Late Woodland (ca. A.D. 300-700). In our continuing efforts to define cultural interactions and ultimately the culture history of upper East Tennessee, we believe that the archaeological investigations at Linville Cave have made a substantive contribution.

Notes. [1]We recognize the faunal analysis is to date somewhat incomplete. Dr. Paul Parmalee was working with the faunal remains from Linville Cave shortly before he passed away. In the time since, Blaine Schubert, vertebrate paleontologist at ETSU, has taken up the task of analyzing and interpreting all of the faunal remains. This is a work in progress and the subject of a forthcoming paper by Schubert and S. D. Dean. Therefore, there are clear and valid reasons for the cursory faunal examination included in this paper.

Acknowledgments: Funding for the radiocarbon determination was provided for by a grant from the East Tennessee State University Office of the Vice Provost for Research and Sponsored Programs Research Development Committee. The National Science Foundation University of Arizona AMS Facility provided the age determination. We would like to thank Roger Hartley and Tammy Hartley, the proprietors of Appalachian Caverns for their interest and support. Charles Faulkner conducted the ceramic analysis some years ago. We are grateful for his interest and expertise. Alan Longmire was kind enough to look at the gun flints and offer some interpretation. Mac McIlhany has been very supportive and informative. We are very grateful to him for many productive conversations on the culture history of upper East Tennessee. We would also like to gratefully and respectfully acknowledge the late Paul Parmalee who identified nearly all of the faunal remains from the site. We alone are responsible for any errors or omissions in this paper.

References

Ahler, Stanley A.
1989 Mass Analysis of Flaking Debris: Studying the Forest Rather Than the Tree. In *Alternative Approaches to Lithic Analysis*, edited by D. O. Henry and George H. Odell, pp. 85-118. Archaeological Papers of the American Anthropological Association Number 1.

Amick, H. C. and L. H. Rollins
1937 *The Geology of Tennessee*. Ginn Press, New York.

Barr, Thomas C., Jr.
1961 *Caves of Tennessee*. Tennessee Division of Geology Bulletin 64. Nashville.

Benthall, Joseph L.
1990 *Daugherty's Cave: A Stratified Site in Russell County, Virginia*. Archeological Society of Virginia, Special Publication Number 18. Richmond.

Boyd, C. Clifford, Jr.
1986 *Archaeological Investigations in the Watauga Reservoir, Carter and Johnson Counties, Tennessee*. Tennessee Valley Authority, Publications in Anthropology, No. 46, University of Tennessee, Department of Anthropology Report of Investigations No. 44, Knoxville.

Bradbury, Andrew P. and Philip J. Carr
1995 Flake Typologies and Alternate Approaches: An Experimental Assessment. *Lithic Technology* 20(2):100-115.

Corgan, James X. and Emanuel Breitburg
1996 *Tennessee's Prehistoric Vertebrates*. Tennessee Division of Geology Bulletin 84. Nashville.

Evans, Clifford
1955 *A Ceramic Study of Virginia Archeology*. Smithsonian Institution Bureau of American Ethnology Bulletin 160.

Washington, D. C.

Faulkner, Charles H.
1982 Radiocarbon Dates from the Eastman Rockshelter: A Preliminary Report. *Tennessee Anthropological Association Newsletter* 7(6):1-3.

Faulkner, Charles H. and S. D. Dean
1982 The Eastman Rockshelter: A Deeply Stratified Site in Upper East Tennessee. *Tennessee Anthropological Association Newsletter* 7(1):2-7.

Fowke, Gerard
1922 *Archeological Investigations*. Bureau of American Ethnology Bulletin No. 76. Washington, D. C.

Franklin, Jay D.
1998 Lithic Analysis. In *Phase III Archaeological Data Recovery of Sites 40GN52 and 40GN63 in the Proposed State Route 350 Corridor, Greene County, Tennessee*, edited and prepared by C. Bentz and Y. Kim, pp. 66-86. Transportation Center, University of Tennessee, Knoxville.

Guilday, John E., Harold W. Hamilton, Elaine Anderson, and Paul W. Parmalee
1978 *The Baker Bluff Cave Deposit, Tennessee and the Late Pleistocene Faunal Gradient*. Bulletin of the Carnegie Museum of Natural History No. 11. Pittsburgh.

Holt, Alana
1967 Linville Cave Legends Live. *Kingsport Times*. Kingsport, Tennessee.

Jordan, Douglas F.
1956 A Clovis Point From Sullivan County. *Tennessee Archaeologist* 12(1):15-16.

Kim, Yong W.
1998 Prehistoric Ceramics. In *Phase III Archaeological Data Recovery of Sites 40GN52 and 40GN63 in the Proposed State Route 350 Corridor, Greene County, Tennessee*, edited and prepared by C. Bentz and Y. Kim, pp. 87-103. Transportation Center, University of Tennessee, Knoxville.

Luther, Edward T.
1977 *Our Restless Earth: The Geologic Regions of Tennessee*. The University of Tennessee Press, Knoxville.

Magne, Martin P. R.
1985 *Lithics and Livelihood: Stone Tool Technologies of Central and Southern Interior British Columbia*. Archaeology Survey of Canada, Mercury Series No. 133, Ottawa.

Manzano, Bruce L.
1986 Faunal Resources, Butchering Patterns, and Seasonality at the Eastman Rockshelter (40SL34): An Interpretation of Function. Unpublished Master's Thesis, Department of Anthropology, University of Tennessee, Knoxville.

McIlhany, Calvert W.
1978 An Archaeological Survey of the Middle Nolichucky River Basin. Unpublished Master's Thesis, Department of Anthropology, the University of Tennessee, Knoxville.

Riggs, Brett H.
1985 Dated Contexts from Watauga Reservoir: Cultural Chronology Building for Northeast Tennessee. In *Exploring Tennessee Prehistory: A Dedication to Alfred K. Guthe*, edited by T. R. Whyte, C. Boyd, Jr., and B. H. Riggs, pp. 169-184. The University of Tennessee, Department of Anthropology Report of Investigations, No. 42. Knoxville.

Schroedl, Gerald F., R. P. Stephen Davis, and C. Clifford Boyd, Jr.
1985 *Archaeological Contexts and Assemblages at Martin Farm*. Report of Investigations No. 39, Department of Anthropology, University of Tennessee, Knoxville.

Taylor, Oliver
1909 *Historic Sullivan: A History of Sullivan County, Tennessee with Brief Biographies of the Makers of History*. The King Printing Co., Bristol, Tennessee.

Jay D. Franklin
Department of Sociology and Anthropology
East Tennessee State University
Box 70644
Johnson City, Tennessee 37614-1702

S.D. Dean
Kingsport, Tennessee

ARCHAEOLOGICAL INVESTIGATIONS ON ROPER'S KNOB: A FORTIFIED CIVIL WAR SITE IN WILLIAMSON COUNTY, TENNESSEE

Benjamin C. Nance

Test excavations on top of Roper's Knob in northern Williamson County exposed Civil War period fortifications and features. The fortifications included a redoubt as well as the rare example of an excavated blockhouse. The investigations also uncovered evidence of a mid-1800s domestic structure likely occupied by the Roper family.

In the fall of 2000, staff of the Tennessee Division of Archaeology conducted test excavations on the state-owned portion of Roper's Knob (40WM101) in Franklin, Tennessee. The site area includes the archaeological remains of an ante-bellum house and a Civil War period Union fortified signal station. The Heritage Foundation of Franklin and Williamson County purchased the Roper's Knob tract in 1994. Partnering with the State of Tennessee, the Heritage Foundation purchased 22.147 acres, and the state later acquired twelve acres of this tract. The state-owned portion is located at the top of the knob where most of the archaeological features are known or believed to exist.

Early History of Roper's Knob

The hill that would become known as Roper's Knob (this name first appears in an 1859 court document) was part of a 2,660-acre land grant that James Robertson, known by most as one of the founders of Nashville, Tennessee, received for service in the American Revolution (Davidson County Deeds, Book D, p. 97). Subsequent land sales broke up the large tract, and in May 1823 John and Cyrus McEwen evenly divided a 310-acre tract that they had inherited from their father David McEwen (Williamson County Deeds, Book G, pp. 378-379). John McEwen's portion of this tract included Roper's Knob, and in 1829 he sold 37 acres, including the knob, to Thomas Hardeman, County Clerk of Williamson County, in trust for Nicholas P. Perkins (Williamson County, Chancery Court Minute Book, 1857-1867, Vol. I, p. 435). The deed from McEwen to Hardeman failed to mention the trust, which would later result in a court battle over ownership of the land (Williamson County Deeds, Book K, p. 208).

Nicholas P. Perkins, a Franklin attorney, paid taxes in 1829 for one free person (himself) and three slaves (Williamson County Tax Records, 1829), and in the following year he paid taxes for five slaves and the 37-acre tract of land that he had purchased from McEwen (Williamson County Tax Records, 1830). Perkins died in 1833 and his heirs, James Perkins, John Perkins, and Ann Elizabeth Knox, began paying the taxes on the 37-acre tract, though none of them lived there (Williamson County Tax Records, 1837-1856). It is shortly after Nicholas Perkins's death that the Roper family shows up in local records.

Historian Park Marshall wrote that Roper's Knob was named for a man named Roper who "lived a great many years on Roper's Knob, but he does not seemed to have owned the land" (Marshall 1970). George W. Roper paid a poll tax in Williamson County in 1833 (Williamson County Tax Records, 1833), and he appears on the 1840 Federal Census in the Eighth District (where Roper's Knob is located) with his wife, two sons, and one daughter (Federal Census, 1840, Williamson County, District 8). Roper's wife, Agnes, hanged herself in May 1840 (Lynch 1977:34).

The 1850 Federal Census lists George W. Roper and his sons George Jr. and Moody as farmers without real estate. A daughter, Mary Roper, is also listed (Federal Census, 1850, Williamson County, District 8, No. 831). George and Moody also paid poll taxes in 1846, 1849, and 1850, but the Ropers disappear from the local records after 1850. They do not appear in the 1860 census records for Tennessee, Illinois, Missouri, Kentucky, Virginia, North Carolina, Mississippi, Alabama, Georgia, Arkansas, or Texas.

The heirs of Nicholas P. Perkins and Thomas Hardeman went to court in 1859 to settle a dispute over ownership of the 37-acre tract of land. The Perkins heirs won the dispute, and the land was subsequently surveyed and sold (Williamson County Chancery Court Minute Book, 1857-1867, Vol. I, p. 435). These court records provide the first documented use of the name "Roper's Knob." W.H.S. Hill purchased the Roper's Knob tract in April 1860 having bought the adjoining tract to the south in the previous year (Williamson County Chancery Court Minute Book, Vol. I, pp. 450, 524; Williamson County Deeds, Book Z, p. 58-59). Hill, a farmer and surveyor, lived in the East Subdivision of Williamson County in 1860, and owned Roper's Knob throughout the Civil War.

Franklin and Roper's Knob During the Civil War

After the Union victory in the Battle of Shiloh in April 1862, Union troops occupied much of Middle Tennessee including Franklin. Major-General Don Carlos Buell established his headquarters in Huntsville, Alabama and ordered General William Negley at Columbia to begin fortifying the Tennessee-Alabama railroad running from Nashville, through Franklin, Columbia, and Pulaski, to Alabama (Connelly 1979:14-32; War of the Rebellion, Official Records of the Union and Confederate Armies [hereinafter referred to as OR], Series I, Volume XVI, Part 2, pp. 177-178). While work on the railroad continued, two companies of the Seventy-Fourth Ohio Regiment established a guard at the Harpeth River bridges in Franklin (OR, Series I, Vol. XVI, Part 2, p. 261).

Confederate General Braxton Bragg led his army from Chattanooga on August 28, 1862 and marched toward Kentucky. General Buell began withdrawing the Union Army from its garrisons throughout Middle Tennessee and moving his troops to intercept Bragg. The two armies met at Perryville, Kentucky on October 8, 1862, and after a day of fighting, the Confederates withdrew. Bragg took up a new position near Murfreesboro, Tennessee, and General William Rosecrans, now commanding the Union Army, returned his troops to Nashville. Confederate forces once again controlled Franklin (Connelly 1979:55-60; Foote 1986:735-739).

Union General David Stanley, commanding the cavalry of the 14th Corps, moved southward from Nashville on December 12, 1862, skirmishing with Confederates at Brentwood. Stanley's cavalry proceeded to Franklin where it swept aside 400 Confederates under Colonel Baxter Smith. The Union forces destroyed the machinery in a flour mill, captured four wagons full of flour, and destroyed a wagon-load of whiskey and brandy before returning to Nashville (OR, Series I, Vol. XX, Part 1, pp. 76-78).

General Rosecrans moved against Bragg in December 1862. The two armies fought along the Stones River in Murfreesboro from December 31, 1862 to January 2, 1863, and though the fight ended in a draw, the Confederates withdrew. In February 1863, Union Forces under Brigadier-General Charles Gilbert occupied Franklin. Union Brigadier-General Jefferson C. Davis's forces reinforced Gilbert (OR, Series I, Vol. XXIII, Part 1, pp. 28, 63).

Union forces began reinforcing their positions in Murfreesboro, Triune, and Franklin, and Confederate victories in skirmishes at Thompson's Station and Brentwood gave a sense of urgency to the construction of fortifications. Captain William Merrill, Chief Engineer of the Army of the Cumberland, designed the defenses of Franklin, and the Pioneer Corps oversaw the construction. The main fortification was Fort Granger, located on a bluff of the Harpeth River overlooking Franklin. Roper's Knob and several small artillery positions supported the main fort. Roper's Knob served as part of a chain of signal stations that provided a communications link from Franklin to Murfreesboro. Additionally the knob had a large redoubt capable of holding four large artillery pieces, a blockhouse, cisterns, and a magazine (Dilliplane 1974:1-43; Dilliplane 1975:10-21).

Several skirmishes took place in the Franklin vicinity during the first half of 1863, most involving Confederate cavalry that was raiding Union positions. By June, General Gordon Granger had moved his headquarters to Triune, and Colonel John Baird commanded the Franklin garrison. On June 24, 1863 General William Rosecrans launched an offensive against Braxton Bragg, and succeeded in flanking the Confederates out of their positions in Wartrace, Shelbyville, and Tullahoma. The Confederate Army retreated southward, and Franklin and the rest of Middle Tennessee became relatively secure, with the exception of minor skirmishes and guerrilla activity (Connelly 1979:61-73).

Major fighting returned in November 1864 when General John Bell Hood led the Confederate Army of Tennessee in an attempt to retake the state and draw Union forces out of Georgia. Fierce fighting at Franklin resulted in heavy Confederate casualties. Heavy artillery fired from Fort Granger during the battle, but it is unlikely that Roper's Knob was garrisoned at the time (Sword 1992:185-271).

Historical Information Concerning the Roper's Knob Fortifications

On February 15, 1863 General William Rosecrans ordered that Brigadier-General Charles Gilbert, whose force had just arrived in Franklin three days earlier, "intrench [sic] himself strongly" (OR, Series I, Vol. XXIII, Part 2, p. 71). Captain William Merrill, Chief Engineer for the Army of the Cumberland, arrived in Franklin on March 7 to supervise the construction of fortifications. It is not clear what, if any, steps Gilbert had taken to fortify his position prior to Merrill's arrival. Gilbert's superior, General Gordon Granger, reported to headquarters that the fortifications would be completed in about one week (OR, Series I, Vol. XXIII, Part 2, p. 113). On March 9 General James Garfield, Chief of Staff for General Rosecrans, told Granger to "push forward the fortifications" (OR, Series I, Vol. XXIII, Part 2, p. 123).

On April 7, 1863 General Rosecrans notified General Granger that if he should want to move against the Confederates, he could leave his baggage in the fort under construction under a small guard (OR, Series I, Vol. XXIII, Part 2, p. 219). This message indicates that Fort Granger was making progress but was not finished. Granger told Rosecrans on April 19 that

FIGURE 1. William Merrill's 1863 sketch of Roper's Knob.

"when our forts are done and the guns in position, 2,000 men can hold them against five times their numbers" (OR, Series I, Vol. XXIII, Part 2, p. 254). He stated in this same report, "The fortifications will be hurried to the utmost."

Captain William Merrill's May 29, 1863 report provides the best description of the Franklin defenses. He says that he had been ordered to design fortifications that a small garrison could hold, and that the main defense was Fort Granger on the bluff of the Harpeth River overlooking the town. This fort also had supporting works that guarded the railroad bridge. He says of Roper's Knob:

Roper’s Knob, which has the remarkable cross-section shown in the sketch [Figure 1], has a rifle pit just above the terrace which surrounds it – a redoubt for four heavy guns – and a blockhouse for 60 men inside the redoubt. On the crest of the terrace surrounding the crown of the hill is a strong line of abattis. It has likewise two cisterns capable of holding 4500 gallons of water, and a good size magazine. 50 men could hold it against 5000. It is the signal station, being visible in all directions from the range of hills surrounding the large valley in which Franklin lies. It sees all the country within a radius of six miles. It is about 250 ft. above the level of the plain, with steep sides and with no hill higher than 30 ft. above the plain, in its vicinity – excepting the one next, which is in easy musketry range and is lower and inaccessible to artillery (Merrill 1863).

Merrill's report implies that the works were complete. During the construction of the works, there were 5,000 infantry working in 600-man shifts, with two eight-hour shifts per day. The 4th battalion of the Pioneer Brigade, which Merrill had raised himself, oversaw the construction (Merrill 1863).

In October 1864, when Confederates were raiding in the Franklin vicinity, Lieutenant-Colonel Josiah Park, who was then commanding the garrison at Franklin, reported that he could not get artillery on Roper's Knob without machinery, and he asked if he should do it (OR, Series I, Vol.

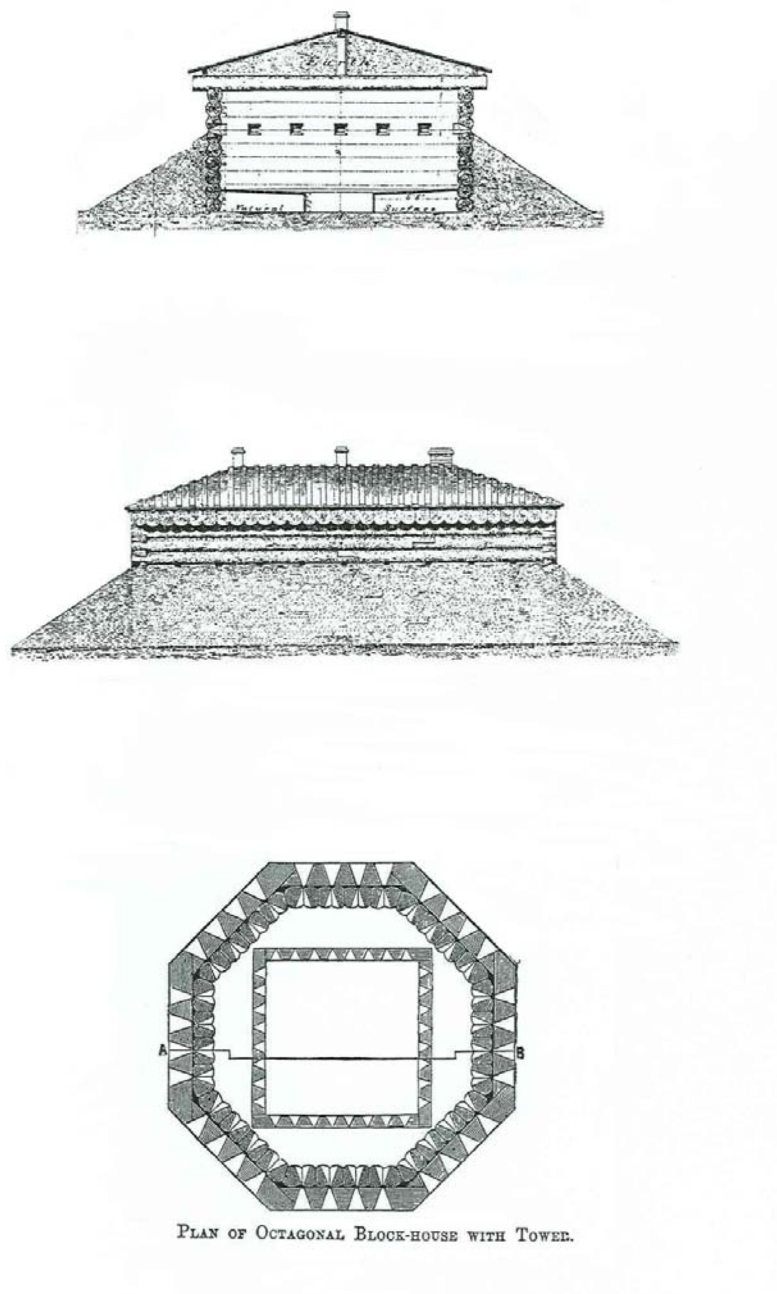

FIGURE 2. William Merrill's sketches of blockhouses, including an example of an octagonal blockhouse.

XXXIX, Part 2, p. 21). It is not clear from written documentation if artillery was ever placed on Roper's Knob. It seems likely that since the redoubt on Roper's Knob was designed to hold four heavy pieces of artillery and the military situation at Franklin in 1863 was somewhat uncertain, there would have been artillery placed there for added defense. It is clear that there was no artillery there in October 1864, and it would seem likely that it was removed during the second half of 1863 when the front lines had shifted southward. One piece of archaeological evidence recovered inside the redoubt that seems to indicate the presence of artillery on Roper's Knob is part of a friction primer used in the firing of artillery.

The artillery would have been inside the redoubt (an enclosed earthen fortification). Redoubts often had formal shapes such as a square, circle, or other polygonal shape, but those built on hills usually conformed to the topography of the hill on which they were constructed. This is not the case with the Roper's Knob redoubt, which appears to be a rectangle with the corners removed. H. L Scott (1864:498-499) states that when artillery is placed in a redoubt, each gun will require 324 square feet. The remaining area in square feet divided by 10 gives the number of men that a redoubt can hold. It is possible that heavy artillery, such as that for which Roper's Knob was designed, would require greater space, and this redoubt contained a blockhouse in its interior thus affecting the minimum number of men required for its defense.

The blockhouse was an important defensive structure that evolved throughout the Civil War (Smith and Nance 2003:144-158). Earlier blockhouses were often two-story structures with overhanging second stories, and early settlers depended on them for defense against Indians. Early use of open stockades for defense of vulnerable railroad lines proved inadequate. In the first half of 1863, seven railroad bridges on the Nashville-Chattanooga Railroad were protected by open stockades in the shape of a cross with arms of equal length (Merrill 1875:439).

General Don Carlos Buell had similarly constructed stockades on the Tennessee-Alabama Railroad in 1862. To be an effective defense the stockade had to be close to the bridge that it was protecting. This proved effective against infantry, but if artillery could be placed so as to fire into an open stockade, they were turned into what William Merrill described as "slaughter pens" (Merrill 1875:441-443).

William Merrill decided that an enclosed blockhouse would be more effective than stockades, and after experimenting by using artillery to blast apart an unused stockade in Lavergne, Tennessee, he also recommended that blockhouses be double cased (built with two layers of timbers) to make a wall about 40 inches thick. Blockhouses were given heavy timber roofs that often had earth piled on them to absorb the impact of artillery projectiles. A board and batten roof kept the earth from washing away. More dirt was piled against the sides of the blockhouse up to the level of the loopholes (firing ports for guns) for added protection. The army furnished the blockhouses with stoves, ventilators, water tanks, and bunks so that the garrison could remain inside the blockhouse (Merrill 1875:439).

Merrill favored octagonal blockhouses, but these were too expensive to build because special skills were needed to cut the mortises and tenons required at the odd-angled joints. He later found a way to build octagonal blockhouses by using simple joints connected by spikes instead of complex joinery, but in the mean time, most blockhouses were built in a square or rectangular plan. There were 54 Union blockhouses protecting the Tennessee-Alabama Railroad in 1864, and during Nathan Bedford Forrest's October 1864 raid and Hood's Middle Tennessee campaign, the Confederates burned all but three. By the end of the war, Union engineers had rebuilt most of the blockhouses using Merrill's simplified octagonal plan as shown in Figure 2 (Merrill 1875:444-446, 452-453).

There is little archival evidence describing the Roper's Knob blockhouse. Merrill (1863) says that the blockhouse was designed to hold 60 men, but he does not give any other description of the structure. Park Marshall, who was born in Franklin in 1855, later wrote, "A fort was built on [Roper's Knob] and was roofed over" (Marshall 1970). He was probably referring to the blockhouse. Archaeological investigations found that the blockhouse was in the form of a square (43 feet across) with the corners cut off. The blockhouse was eight-sided but not a true octagon.

Signal Stations During the Civil War

One of the important functions of Roper's Knob during the war was its use as a signal station. Major Albert Meyer, organizer of the United States Signal Corps, developed a simplified system of signaling using flags (torches at night). Meyer based his new system on his observations of Comanche signaling while he served with the U.S. Army in the New Mexico Territory. Meyer later tested his system during a campaign against the Navaho. At the outbreak of the Civil War, Albert Meyer reported to Washington where he established an instruction camp for the Signal Corps (Brown 1896: 19-20; 24-39).

The Union Army established a signal camp of instruction in Nashville in February 1862. Lieutenant Jesse Merrill commanded the camp until its disbandment on May 16, 1863 (Brown 1896: 459-460). At this time there were several signal stations in operation in Tennessee, including a chain of stations between Franklin and Murfreesboro. Confederate Captain Edward B. Sayers drew a sketch map showing five of these signal stations including Roper's Knob. Most of the stations shown on the map are about five miles apart. Albert Meyers stated that signals could be read at a distance of eight miles under normal conditions and up to 15 miles under ideal conditions (Brown 1896:93; Sayers 1863).

Signal flags were used in conjunction with a system of telegraphs because each had its limitations. During an attack on the Union forces at Franklin (either General Van Dorn's raid of April 10, 1863 or General Forrest's attack on June 4, 1863), the Confederates cut the telegraph wires between Franklin and Murfreesboro. The Union commanders in each town were able to communicate throughout the skirmish by using the signal stations (OR Supplement, Part I, Volume 10, p. 541).

Signal stations took many forms, and there is no specific information on what the Roper's Knob station looked like. Many stations were wooden platforms built in trees from which the upper branches had been cut. Some were built onto existing buildings. Park Marshall wrote that a pear tree had been left standing half way up the upper part of Roper's Knob while all the other trees had been cleared. Marshall said that this tree had a limb that extended over a tramway, and a rope was placed over the limb to haul artillery up the knob. Marshall observed Civil War events in Franklin when he was a young boy and wrote about them later in life. It is possible that he may be remembering a tree that was left standing for use as a signal station. He also mentioned in his writing that in Fort Granger "the trunks of two trees used as 'spy trees' were left standing within the fort" (Marshall 1970).

Post-War History of Roper's Knob

W.H.S. Hill owned Roper's Knob until 1875 when he sold it, as part of a 180-acre tract, to A. W. Moss. The deed describes part of the property as the "Roper's Knob or Perkins Tract" (Williamson County Deeds, Book 5, p. 327). Own-

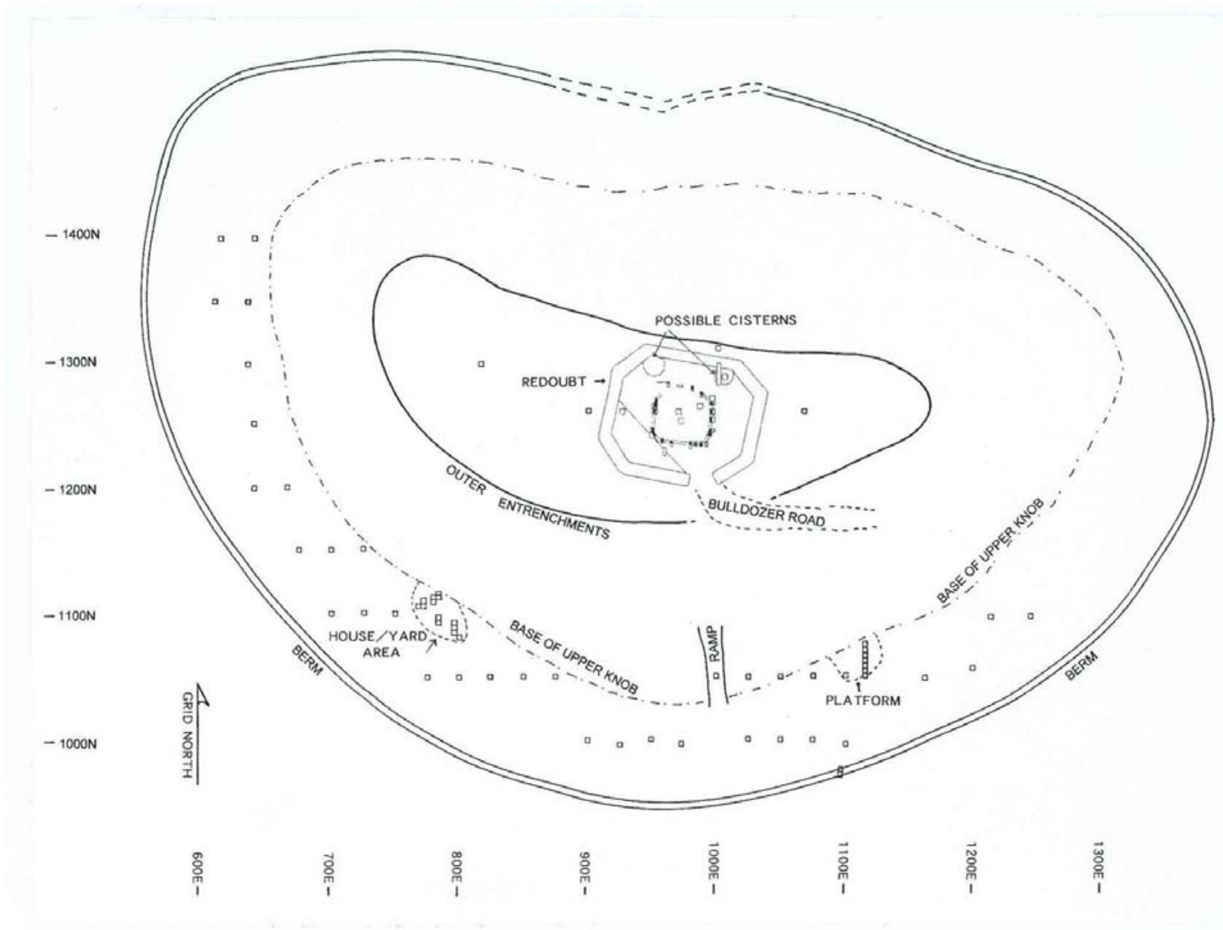

FIGURE 3. Base map of Roper's Knob archaeological site showing location of excavation units.

ership of the property changed several times over the years until the 1994 acquisition by the State of Tennessee and the Heritage Foundation. Throughout its post-war history, Roper's Knob seems to have been a popular place to visit, probably because of the Civil War earthworks and the view afforded by the prominence. Recent activity on the knob has included relic collecting and camping.

Archaeological Investigations

State surveyors established grid points on Roper's Knob prior to archaeological testing. The grid was oriented 37.5 degrees west of magnetic north so that a line could be run straight up the ramp into the redoubt. The site was divided into specific areas for testing, including the Redoubt, Outer Entrenchments, Ramp, Terrace (subdivided into three parts), a Platform near the base of the upper knob, a Berm on the edge of the terrace, and the House and Yard areas (identified from a large pile of brick and stone rubble). These areas are shown on the base map in Figure 3. Excavation units (most of them 4-ft. by 4-ft. squares) were placed based on the presence of surface remains, in areas thought to be likely encampments, and in areas where a metal detector scan indicated the presence of large amounts of metal.

In the area of the House and Yard and the feature referred to as the Platform, culturally related levels were grouped into zones. In the House area, Zone I is defined as the zone of heavy rubble associated with the destruction of the building. Zone II is what lies beneath the rubble, theoretically dating prior to the destruction of the house. The horizontal extent of the rubble was used to define the area of the "House": and the "Yard" was defined as the area outside the heavy rubble. The excavation levels for the Platform were also grouped into two zones. Specific archaeological features were assigned feature numbers (Table 1).

TABLE 1. Archaeological Features.

Number	Type
1	Wall (Parapet) of Redoubt
2	Outer Entrenchments
3	Ramp
4	Possible Cistern (East)
5	Possible Cistern (West)
6	Berm on outer edge of terrace
7	Historic Posthole in 1062N1116E
8	House Foundation
9	Historic Posthole in 1066N1116E
10	Builder's Trench outside house foundation
11	Builder's Trench inside house foundation
12	Blockhouse Wall Trench
13	Probable Posthole
14	Probable Posthole
15	Probable Posthole
16	Probable Posthole

Redoubt

A redoubt is an enclosed earthen fortification that often has a regular form, such as a square or pentagon, or an irregular form following the contours of the land (Scott 1864:497-498). The Roper's Knob redoubt has a regular eight-sided shape as shown in Figure 4. It appears that the knob was leveled off during construction of the fortifications, and the dirt was used to build the redoubt walls.

Excavation units in the center of the redoubt revealed the siltstone bedrock just inches below the surface. Units placed in the northern portion of the redoubt showed a deeper soil, probably a result of leveling the top of the knob. A series of excavation units, each 3-ft. by 4-ft., was placed across a depression that was believed to be one of the two cisterns mentioned by Merrill (1863).

Within a fortification, artillery was usually mounted on a terreplein which is a level space on the interior of the works. The terreplein was raised above the interior surface of the fortification and often covered with wooden planks to make it easier for gun crews to maneuver the artillery piece. The artillery would either fire over the top of the parapet wall (en barbette), or it would fire through an opening called an embrasure. As shown in Figure 4, there is at least one raised area inside the Roper's Knob redoubt that was probably a terreplein. This probable terreplein is in the southwest corner of the redoubt facing downtown Franklin. In the southeast corner of the redoubt, there is a remnant of a possible platform against the inner parapet wall, but this is an area damaged by a bulldozer cut through the wall. There are several openings in the parapet wall of the Roper's Knob redoubt, but all seem to be worn down from years of foot traffic and are not large enough to be embrasure openings. Merrill (1863) reported that the four irregularly shaped battery positions in the vicinity of Roper's Knob were first designed as barbette batteries but were later changed to embrasure batteries.

Cut limestone blocks were observed in some of the worn portions of the redoubt wall, and it is possible that these were taken from the remains of the house located on the terrace below the redoubt. There is weathered and thinly layered limestone or siltstone in other parts of the

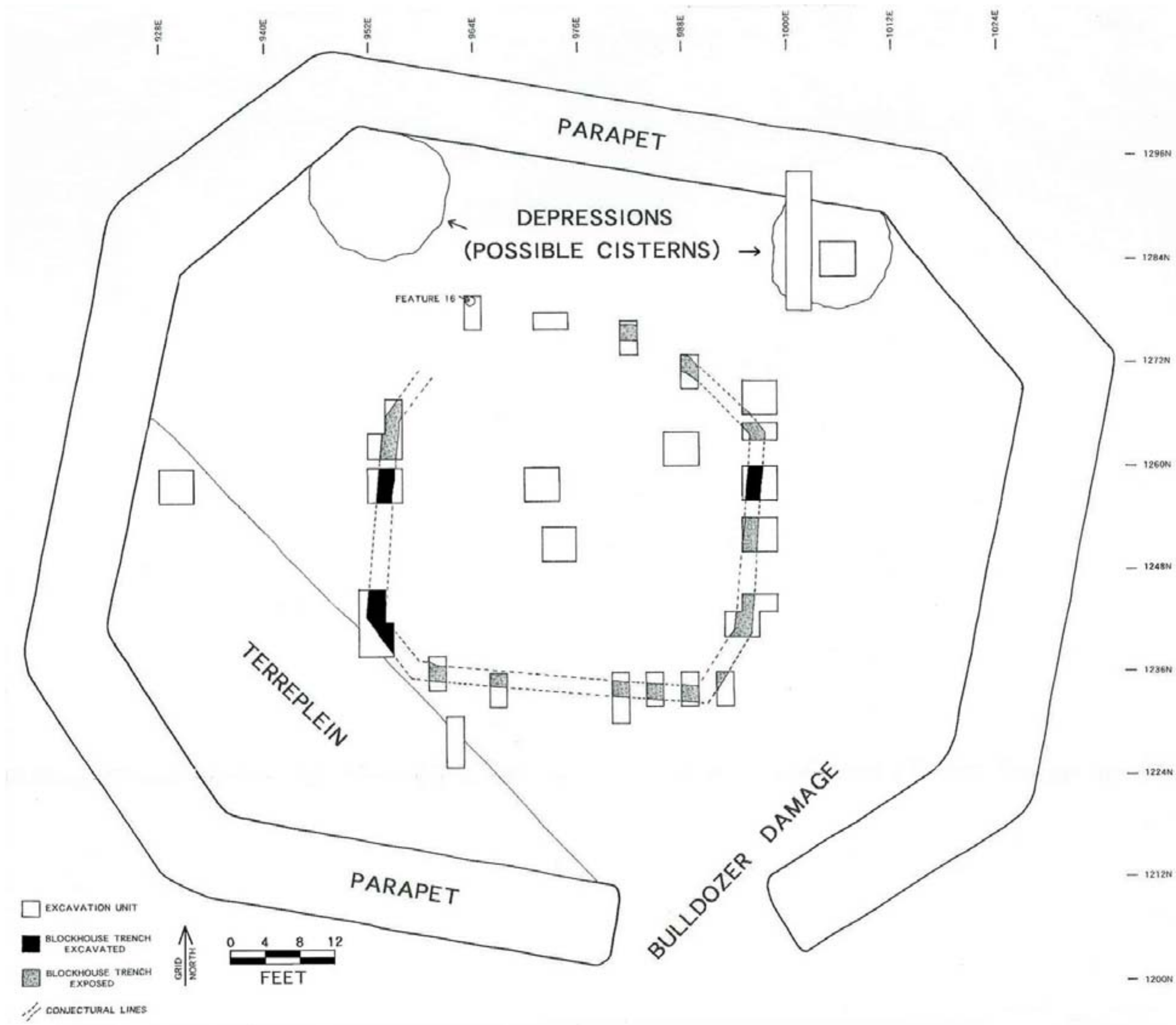

FIGURE 4. Map of Roper's Knob redoubt.

wall, and this is possibly the remains of the knob's natural stratigraphy.

Blockhouse

William Merrill's sketches of typical blockhouses (see Figure 2) show that a footing trench was dug and heavy timbers were placed vertically into the trench (Merrill 1864, Map V). Earth was often piled against the sides of the blockhouse, and this earth is what often remains today. The area inside the Roper's Knob redoubt showed no signs of earthen mounds, and such added protection may have been deemed unnecessary in such an application where the blockhouse was inside a redoubt on a high, steep hill.

Excavation of unit 1256N952E revealed a trench cut into the bedrock approximately 18 inches wide and 24 inches deep (Figure 5). As more brush was cleared from the redoubt during the excavation, it became evident that there was a shallow depression marking the line of the wall trench in some parts of the redoubt,

FIGURE 5. Photograph of section of blockhouse wall trench.

particularly on the east and west sides. By following this depression, several excavation units were placed to reveal the wall trench. Only three portions of the blockhouse wall trench were fully excavated. To save time, the remaining units were excavated only to the top of the blockhouse wall trench (which was then mapped).

The blockhouse wall trench is indicated on the map in Figure 4 as well as conjectural lines showing the probable configuration of the blockhouse. The configuration of the blockhouse appears to be basically square with the corners cut off, making it eight-sided but not a regular octagon. The plan of the blockhouse becomes somewhat unclear on the north side. Here the soil was deeper than in the rest of the redoubt. What appears to be the blockhouse wall trench was detected in unit 1273N981E, the northern most portion of the trench indicated on Figure 4. If this is indeed the outer wall of the redoubt, then the overall configuration is slightly irregular, this wall being farther north than would be predicted. One possibility is that this trench represents part of an offset wall that protected the entrance to the redoubt. Blockhouses usually had such an L-shaped wall in front of the entrance to prevent an enemy from firing directly at the door.

Merrill suggests in his blockhouse sketches that the logs used to construct blockhouse walls should be about 18 inches in diameter. This is the average diameter of the wall trench on Roper's Knob, so obviously the logs used in the Roper's Knob blockhouse were smaller than 18 inches. There was probably no need for the Roper's Knob blockhouse to be double-cased (i.e. two layers of logs), and no earthen embankment seems to have been added to the structure.

The Roper's Knob blockhouse is significant, being a rare example of an excavated blockhouse in Tennessee. It is unusual because the wall trench is dug into solid stone, which readily reveals the overall shape and size of the structure.

Cisterns

William Merrill stated in his 1863 report that Roper's Knob had two cisterns with a capacity of 4,500 gallons of water (Merrill 1863). He does not state precisely where these cisterns were located, but two large depressions inside the redoubt near the northern slope were suspected to be the remains of these cisterns. The easternmost of these two depressions was tested by excavating a series of 3-ft. wide by 4-ft. long units along the 1000E line to cross-section the depression. One additional 4-ft. by 4-ft. unit was excavated at 1282N1004E. The soil in these units was disturbed, showing little variation in color or consistency. Several large stones were present in these units. These stones may have once been part of a cistern structure, but now occur in disturbed context.

Artifactual evidence from the suspected cistern indicates that the area has been highly disturbed, probably through relic collector activity. Civil War period items such as Minie Balls, percussion caps, one musket band spring, and a friction primer wire were recovered from the cistern units along with much modern material. In addition, several pieces of (probable roofing) tin were removed from these units.

Outer Entrenchments

A line of entrenchments (designated Feature 2) surrounds the upper knob outside the redoubt. The entrenchments are irregularly shaped and follow the contour of the knob. These entrenchments are very pronounced and well preserved around the north, west, and east portions of the knob. They are shallower and more eroded on the south side. A bulldozer road cuts through the entrenchments on the southeast side. One excavation unit was placed in the outer entrenchments on the north side of the knob. The bedrock in this area slopes steeply to the north. Apparently a large amount of fill dirt was used in the construction of the parapet wall of the outer entrenchments on the north side of the knob. Merrill mentions that a rifle pit just above the terrace surrounded the knob.

Ramp

Roper's Knob has an earthen ramp that extends from the terrace to the upper part of the knob where it blends into the natural slope. The ramp provides a uniform slope up to the level of the redoubt. The Union troops used the ramp to haul artillery up to the redoubt. A previous section of this article mentioned that Lieutenant Colonel Josiah Park reported he could not get artillery on Roper's Knob without machinery (OR, Series I, Vol. XXXIX, Part 2, p. 21). Park Marshall wrote that "there was a tramway up the steep part of the knob, up which were hauled the guns by means of block and tackle." He also stated that this tramway had heavy cross-ties and heavy square wooden beams for the rails, and "an engine and derrick were installed with ropes and drum to draw up heavy artillery" (Marshall 1970). Getting heavy artillery into the redoubt on Roper's Knob was no easy task.

One 4-ft. by 4-ft. unit was excavated on the ramp at 1050N1100E. It is evident that the ramp was constructed by digging a ditch on both sides of the ramp and piling the dirt in the middle. The natural stratigraphy of the soil is overlain by the inverted stratigraphy resulting from the soil having been removed from the ditch on either side and shoveled into the center to form the ramp.

Platform

This feature is a level area at the base of the upper knob on the southeast side. The platform appears to be man-made. At the time of the excavation, several limestone blocks were visible on the surface as were several recent holes left by relic collectors. One 4-ft. by 4-ft. excavation unit (1050N1100E) was dug near the western edge of the feature. Seven adjoining 3-ft. by 4-ft. units were excavated along the 1116E line to cross-section the feature.

The platform appears to have been constructed by piling dirt behind some sort of retaining wall. Several large stones that may have been part of such a wall were found in the excavated trench, though they appear to have been disturbed. The bottom portions of six possible postholes were found in the units excavated on the platform.

Artifacts recovered from the platform suggest the presence of a structure used for military purposes. Over 700 (n=712) nails were recovered from Zone I of the platform. These artifacts, along with the previously mentioned postholes, point to the existence of some sort of structure. A more complete excavation would be needed to determine the configuration of this structure. A purely military use of the platform and its related structure is suggested by the presence of Civil War artifacts including Minie Balls, percussion caps, and military buttons, as well as the paucity of domestic artifacts.

Berm

The berm (Feature 6) is a slight rise located on the crest of the terrace surrounding the hill. Merrill states in his May 29, 1863 report that "on the crest of the terrace surrounding the crown of the hill is a strong line of abattis (sic)." An abatis is a barricade of felled trees that have had their smaller branches removed and the remaining branches sharpened (Scott 1864:19). The visible rise or berm on the crest of the terrace (or crown of the hill as Merrill describes it) may be related to the abatis, perhaps being the remnant of a shallow trench behind the abatis.

Terrace

The flat terrace of Roper's Knob is located about 80 ft. below the summit of the hill. It is relatively flat on the west, south, and east and somewhat more sloping on the north side of the hill (which is generally steeper overall). A series of excavation units was placed on the west, south, and east sides of the knob as the terrace seemed like a logical place for troops to have camped. Relatively few artifacts were recovered from the terrace test units, but this area has been intensely searched by relic collectors who have reported finding numerous Minie Balls, buttons, at least one bayonet, and other Civil War military artifacts.

House

An area of limestone and brick rubble, clearly visible on the ground surface, indicated the presence of a structure. This rubble was located on the south terrace against the upper knob. For the purposes of this project, the area around the rubble zone was divided into two areas, the house and the yard. The in-situ portions of the building and the fallen rubble defined the house. Most of the rubble appeared to be the result of a chimney fall at the east end of the building. The house was divided vertically into two zones. Zone I defined the vertical extent of the rubble, and included the excavation unit levels within the rubble area. Zone II included those levels below the horizontal extent of the heavy brick and limestone rubble (thought

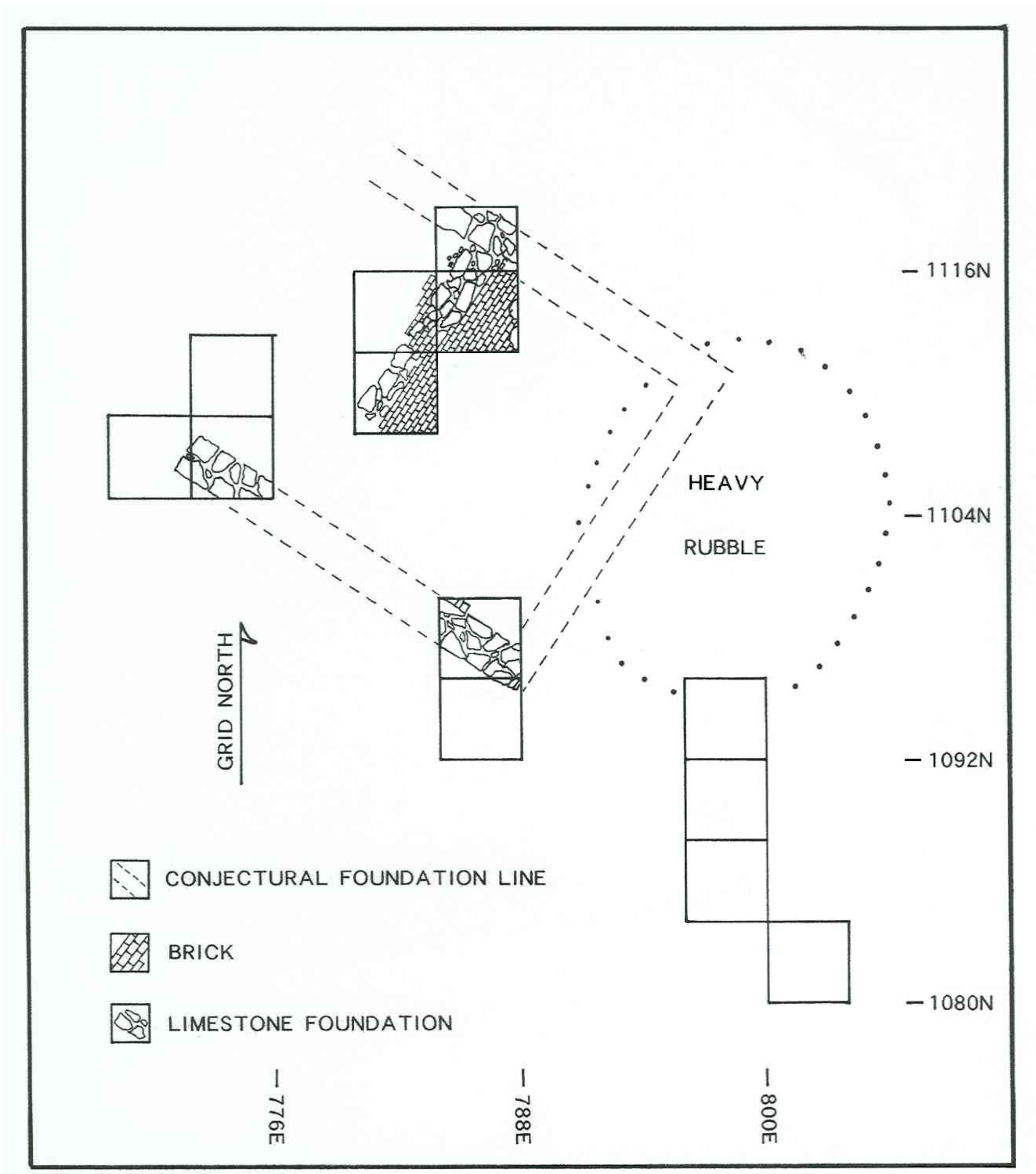

FIGURE 6. Map of excavation units in the house and yard area.

FIGURE 7. House remains including north foundation wall, cross wall, and portion of brick floor.

to represent the time period before the house destruction). The yard was defined as the area outside of the horizontal extent of the heavy rubble, but still in the general vicinity of the house.

Figure 6 shows the placement of excavation units in the house and yard area as well as the portions of the house foundations uncovered during the investigations. Initial excavation in the house/yard area was a series of 4-ft. by 4-ft. units along the 800E line. Subsequent excavation units revealed portions of the house foundation (designated Feature 8). The foundation, made from limestone blocks, was 24 inches thick and extended well below the ground surface.

The excavations also uncovered the remnants of a stone cross-wall in the house (Figures 6 and 7). This wall likely postdates the original house as it was built on top of a brick floor. The purpose of this wall is unknown, but it may indicate some attempt at house repair. Also, the west side of the house had no foundation wall. This unusual attribute was confirmed by the absence of a builder's trench. The overall dimensions of the house were 18 feet by 30 feet. The massive foundation wall suggests the entire house was made of stone, or at least had a lower floor (or above-ground basement) of stone with a wooden structure over it. There appears to have been a stone chimney with a brick firebox on the east end of the structure.

Most of the historic artifacts from 40WM101 came from the house and yard area. The documentary and archaeological evidence suggest the house was occupied for a relatively short period of time

FIGURE 8. Stone carvings found on Roper's Knob.

(no earlier than 1829 and no later than 1863). The house was probably destroyed in 1863, with the materials used in the construction of the Civil War fortifications.

Stone Carvings

Several carvings in the stone outcroppings on Roper's Knob include names, initials, and dates (Figure 8). Carvings observed during the test excavation project appear on the upper knob near the earthworks, with the exception of one loose stone found near the house. The carved dates range from 1870 to 1935. However, some undated carvings seem to be recent. This early form of graffiti is evidence of the popularity of Roper's Knob as a spot to visit following the war. The Union army had cleared the trees off of the knob, providing an unobstructed view of the surrounding countryside. In addition, the earthworks themselves were a likely attraction.

Analysis of Historic Period Artifacts

A total of 5,445 historic period artifacts were recovered during the Roper's Knob excavations (Table 2). Also found were 340 artifacts classified as "Miscellaneous Modern," 642 pieces of faunal material, and 866 prehistoric artifacts. Historic artifacts were analyzed and tabulated using a system modified from South (1977:95-96) in which artifacts are divided into functional groups and then subdivided into classes. This modified system has been used for prior Division of Archaeology projects including Fort Southwest Point and Fort Blount (Smith 1993; Smith and Nance 2000). This article also includes a

TABLE 2. Distribution of Historic Period Artifacts.

GROUP AND CLASS	South Terrace	West Terrace	East Terrace	House Z I	House Z II	Yard	Platform Z I	Platform Z II	Redoubt	West Side of Redoubt	East Side of Redoubt	Feature 1	Feature 2	Feature 3	Feature 4	Feature 6	Feature 10	Feature 11	Feature 12	SITE TOTAL	% of Site Total
KITCHEN GROUP	61	88	18	942	235	366	56	0	150	19	3	0	2	1	40	1	6	0	299	2,287	42.00
ARCHITECTURAL GROUP	59	105	19	1,284	163	184	735	0	205	18	0	0	0	0	61	0	4	0	28	2,865	52.62
FURNITURE GROUP	0	1	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0.17
ARMS GROUP	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	0.11
CLOTHING GROUP	0	1	0	11	0	2	7	0	2	0	0	0	12	0	0	0	0	0	1	55	1.01
PERSONAL GROUP	0	0	0	3	0	0	1	0	1	0	0	0	0	0	2	0	0	0	1	8	0.15
TOBACCO PIPE GROUP	0	0	0	6	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	10	0.18
ACTIVITIES GROUP	5	5	7	49	7	2	37	0	20	7	0	0	0	0	1	0	6	0	3	149	2.74
CIVIL WAR GROUP	1	1	0	12	0	1	32	0	5	0	0	0	0	0	2	0	0	0	2	56	1.03
SITE TOTAL	126	201	44	2320	405	557	868	0	385	44	3	0	14	1	106	1	16	0	335	5,445	100
PERCENT OF SITE TOTAL	2.31	3.69	0.81	42.61	7.44	10.23	15.94	0.00	7.07	0.81	0.06	0.00	0.26	0.02	1.95	0.02	0.29	0.00	6.15	100	

"Civil War Military Artifact Group" previously used to classify Civil War material recovered from the Carter House in Franklin (Smith 1994:70).

The "Civil War Military Artifact Group" shows those items associated with the primary historical event that affected Roper's Knob. Relatively few military artifacts were recovered from the site area, a fact that reflects the extensive collecting of such artifacts on this and most other Civil War sites. Several collectors that had searched the site (with permission of the landowner when it was privately owned) shared information on their finds with the author. Artifacts mentioned as found included such items as Minie Balls, Burnside's Cartridges, bayonets, military buttons, one silver-plated Union belt buckle, and a scabbard tip.

Kitchen Group

The Kitchen group includes ceramics, glassware, tableware, kitchenware, and bottle glass. The 2,287 artifacts recovered from Roper's Knob make up 42.1% of the total number of historic period artifacts. The largest single class within the Kitchen group is ceramics.

The 874 ceramic sherds recovered from Roper's Knob consist of porcelain, creamware, pearlware, whiteware, coarse earthenware, and stoneware. These sherds represented a variety of decorative types and vessel forms. Identified individual vessels (minimum of 45) include plates, cups, bowls, pitchers, jars, and vessel lids.

A mean ceramic date was calculated for the house/yard area of Roper's Knob using the formula developed by South (1977:217-218, 236). As expected, the sherds from Zone II of the house yielded an earlier date that those of Zone I. Taken together, the ceramics from the house and yard yielded a mean ceramic date of 1848.1.

Two hundred ninety-one fragments of dark olive wine bottles were recovered, with the majority of these items coming from the house and yard area. One characteristic observed on these bottles is an applied lip. This bead of glass, added after the bottle was sheared from the blowpipe, is characteristic of bottles manufactured between 1840 and 1870. Some of the fragments denoted a bottle that was blown into a mold but the neck hand-finished, suggesting a manufacture date between 1845 and 1885 (Newman 1970:72-75). A pontil scar, caused by the use of a tool attached to the base of a bottle during finishing, was evident on a base fragment found in the yard area. Pontils were used in bottle manufacture before 1870 (Jones 1971:68-72). These suggested dates fit well with the occupation period of the house.

Other Kitchen Group artifacts include one fragment of a square-sided case bottle, two fragments of tumbler glass, 39 pieces of pharmaceutical bottles, 365 pieces of general bottle glass, and 73 pieces of glassware that were pieces of two decorative serving dishes. Six pieces of tableware were recovered as well as 636 fragments of kitchenware (most of which was miscellaneous tinware).

Architectural Group

This group, comprised of artifacts related to the construction of buildings, is the largest single group from the Roper's Knob site with 52.8% of the total historic artifacts. Window glass totaled 1,016 pieces, of which roughly 94% came from the house/yard. Two formulae were used to calculate a manufacture date for the glass based on the thickness. Window glass thickness increased through the nineteenth century, and each formula assumes a straight-line progression of this trend. Ball (1982:13) developed a formula based on samples from several sites (primarily in Kentucky). Moir's (1987) formula, as quoted in Meyers (2001:69), is slightly different. Applying each formula to the glass found in the house/yard area of Roper's Knob produced the results shown in Table 3. Meyers (2001:69) states that Moir's formula seems to be accurate to within 15 years for sites in Tennessee.

TABLE 3. Dates Based on Window Glass Thickness.

Formula	House Zone I	House Zone II	Yard
Ball	1806.9	1806.2	1807.9
Moir	1812.5	1812.1	1814.6

Nails and spikes recovered from Roper's Knob total 1,812 specimens. Nails comprise the largest single class represented in both the redoubt (n=255) and platform (n=712). A total of 672 nails were recovered from the house/yard. Thirteen of the fourteen spikes came from the redoubt and associated features. Most of the identifiable whole nails were machine-made with an approximate date range of 1830-1885 (Edwards and Wells 1993:56, 61-62).

Thirty-eight artifacts classified as Construction Hardware include construction staples, roofing tin, a pintle, iron hinge, and iron escutcheon.

Furniture Group

Eight of the nine artifacts assigned to the Furniture Group came from the house area. Items in this group include lantern wick adjustors, a hasp, brass escutcheon, iron wing nut, and upholstery tacks.

Arms Group

The Arms Group consists of artifacts associated with firearms, but does not include the Civil War period artifacts. Six artifacts were recovered, five of which came from the house. One .65 caliber musket ball, thought to be pre-Civil War, was found in Feature 12 (the blockhouse trench). Additional specimens were three gunflints and two lead shot.

Clothing Group

Thirty-nine artifacts belonging to the clothing group were recovered during the investigations. These items include buckles, buttons, straight pins, hook and eye fasteners, shoe parts, and a strap slider. Although this category does not include military buttons, it is possible that military

TABLE 4. Distribution of Civil War Military Artifacts.

	South Terrace	West Terrace	East Terrace	House Z I	House Z II	Yard	Platform Z I	Platform Z II	Redoubt	West Side of Redoubt	East Side of Redoubt	Feature 1	Feature 2	Feature 3	Feature 4	Feature 6	Feature 10	Feature 11	Feature 12	SITE TOTAL	%
Minie Ball																					
.54 cal.	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5.4
.58 cal.	0	1	0	1	0	1	6	0	3	0	0	0	0	0	1	0	0	0	0	13	23.2
melted	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.8
William's Cleaner, .58 cal	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.8
Bullets																					
.45 cal.	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.6
.54 cal. (Sharp's)	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.6
Casings																					
.32 cal. Rimfire	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1.8
.32 cal. Centerfire	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1.8
PERCUSSION CAP, rifle	0	0	0	2	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	24	42.9
PERCUSSION CAP, pistol	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.8
Fragment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1.8
BUTTONS																					
Large, Brass, Eagle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1.8
Small, Brass, Eagle	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3	5.4
MUSKET BAND SPRING	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1.8
FRICTION PRIMER WIRE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1.8
TOTAL	1	1	0	12	0	1	32	0	5	0	0	0	0	0	2	0	0	0	2	56	100

personnel used some of the civilian type clothing items. Sixteen clothing items came from the house/yard area, and one derived from the west terrace. Seven clothing artifacts (including five buttons) came from the platform, a feature that seems to have had a military function. Twelve shoe tacks were recovered from the outer entrenchments (Feature 2) and one bone button came from the block-house wall trench (Feature 12).

Personal Group

The Personal Group includes items presumably owned and used by individuals. Eight personal items recovered from Roper's Knob consist of two pencil fragments, three comb pieces, one specimen thought to be a piece of jewelry, and two finials from canes or umbrellas.

Tobacco Pipes

The Tobacco Pipe Group is a modified category for all smoking paraphernalia (Smith and Nance 2000:139, 251). Eight fragments were found in the house/yard area, and two were recovered from the redoubt. The ten pipe fragments recovered from 40WM101 consisted of eight pieces of stoneware stub-stemmed pipes and two kaolin pipe sections.

Activities Group

The Activities Group contains several classes of artifacts that pertain to a variety of activities. The group as proposed by South (1977:96) includes such classes as construction tools, farm tools, toys, fishing gear, storage items, stable and barn, miscellaneous hardware, and military objects. Not all of these classes are represented in

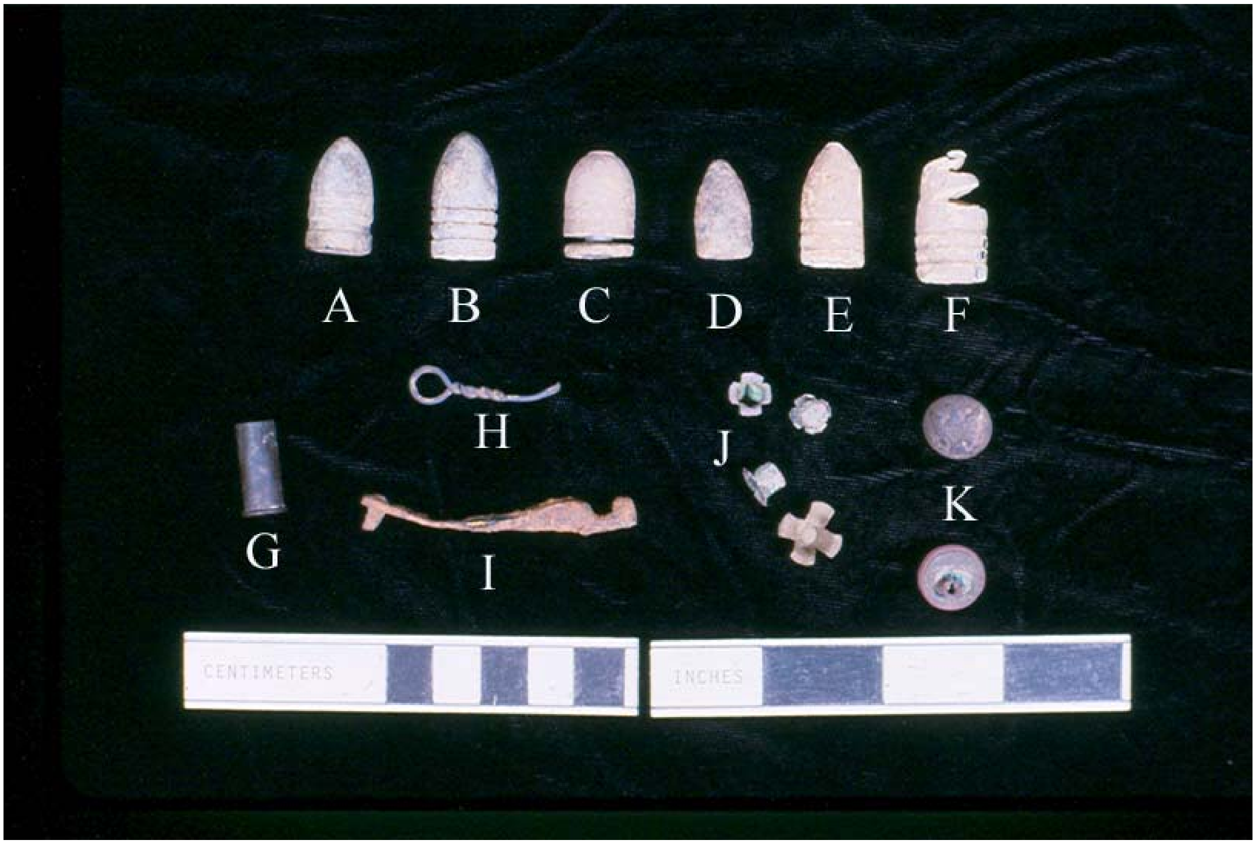

FIGURE 9. Civil War Military Artifacts: A. .54 cal. Sharp's carbine bullet, B. .58 cal. minie ball, C. .54 cal. William's Cleaner bullet, D. .45 cal. bullet, E. .58 cal. minie ball, F. Carved minie ball, G. .32 cal. shell casing, H. Friction primer wire, I. Musket band spring, J. Percussion caps, K. Federal uniform cuff buttons.

the Roper's Knob collection. The 148 artifacts classified as belonging to the Activities Group comprise just 2.7% of the total number of historic artifacts.

Among the Activities Group artifacts recovered from Roper's Knob are 42 items classified as Stable and Barn artifacts. Thirty-two of these artifacts are horseshoe nails, with the largest concentration (n=16) coming from the platform. Sixty-seven artifacts concentrated in the house, platform, and redoubt areas fall under the Miscellaneous Hardware category. One interesting item found at the house was a button mold used for casting metal buttons.

Civil War Military Artifact Group

The Civil War Military Artifact Group is not part of South's (1977:95) original classification scheme, but has been used elsewhere to account for these particular artifacts (Smith 1994). Table 4 lists the 56 Civil War artifacts recovered from Roper's Knob. Many of these artifacts were situated among larger rocks that would have shielded them from detection by relic collectors. Collectors interviewed during the project reported finding military buckles, bayonets, bullets, and Burnside type casings. The cavalry used Burnside carbines, and the presence of Burnside casings (assuming the reports are accurate) may indicate the use of Roper's Knob as a cavalry outpost and observation point.

Representative samples of the Civil War artifacts are shown in Figure 9.

Minié Balls. Minié Balls, named for Claude Etienne Minié, were improvements over the standard round ball. The conical shape and hollow base meant that the projectile would expand when fired and grip the spiral rifling of the weapon's barrel (Lord 1965:15) for greater range and accuracy. Of the 18 Minie Balls recovered from the site, 13 are .58 caliber and three .54 caliber. One partially melted example could not be measured. The remaining bullet is a type called a William's Cleaner. This particular bullet has a plunger at the base and a small flange that was compressed when fired so that the flange scraped the barrel, cleaning residue left from burning gunpowder.

Four other bullets were retrieved during the investigations. Two are .45 caliber, but no further information could be determined about them. Two .54 caliber Sharp's type bullets were also found. All specimens were found in Zone I of the house.

Two .32 caliber shell casings were recovered from the site, one rimfire casing and one centerfire. Neither item was marked with headstamps.

Percussion Caps. Percussion caps are small brass caps that contained mercury fulminate. This crystalline compound (made from a blend of mercury, alcohol, and nitric acid) exploded when forcibly struck. The mercury fulminate in the brass cap sent a spark into the barrel of a musket, thus igniting the powder and firing the weapon. Twenty-six specimens (25 whole and one partial) were found during the excavation. Twenty-two of these derived from Zone I of the platform. One of the caps recovered is small, indicating that it was used for a pistol rather than a musket.

Musket Band Spring. One musket band spring was recovered from the redoubt. The band spring holds the musket band in place when it is slid onto the stock. This example is made of iron.

Friction Primer. The brass wire portion of a friction primer was recovered from Feature 4 (the suspected cistern). A friction primer is a hollow brass tube filled with gunpowder, with a piece of wire pushed into and perpendicular to the tube. The tube is placed into the touchhole of a cannon, and a lanyard is attached to the wire. When the lanyard is pulled, the friction ignites the powder, thus firing the cannon.

Other Artifacts

Additional artifacts recovered from Roper's Knob (but not included in Table 2) include 642 pieces of animal bone and shell; materials such as brick, mortar, charcoal, and coal; and 340 artifacts classified as Miscellaneous Modern Material.

Conclusions

One of the goals of the test excavations conducted on Roper's Knob was to assess the extent of archaeological remains on the site for the purpose of their long-term preservation. Roper's Knob went through two phases that left distinct archaeological remains. These phases are: (1) the domestic occupation during which a house was constructed on the terrace of the knob and inhabited probably no more than 30 years, possibly by the Roper family; and (2) the military occupation of the site during the Civil War when fortifications were constructed on the knob. Historical documentation provided insights into both of these phases and helped predict the types of archaeological remains that might be present.

By piecing together the available

documentary and artifactual evidence, it is possible to infer a general history of the house. The house was likely built, or at least begun, by Nicholas P Perkins sometime between 1829 and 1833. Following his death in 1833, Perkins heirs retained possession of the land but didn't actually live there. The Roper family appears to have lived on the site (possibly) as early as 1836 and (at least) as late as 1850, but were clearly gone by 1859.

Construction of the fortifications on Roper's Knob began in February 1863, and were probably completed by May of that same year. The house was likely dismantled and the material used in the construction of the fortifications.

The visible (above ground) and archaeological features of Roper's Knob comprise an important historical resource that is well worth preservation and further study. This resource includes the archaeological remains of a house dating from the first half of the nineteenth century, and, more importantly, examples of blockhouse construction, earthen fortifications, a signal station, and troop encampments. The wall trench of the blockhouse, cut into solid bedrock, is an unusual Civil War military feature that deserves more archaeological attention. There is also the potential for locating the remains of the two cisterns and the magazine.

The State of Tennessee and the Heritage Foundation of Franklin and Williamson County took the initial step in the long-term preservation and interpretation of Roper's Knob by purchasing the property. At this time, the site area continues to suffer from extensive relic collecting, camping, hiking, and dirt bike riding. However, a long-term goal is to open Roper's Knob to the public with hiking trails access and interpretive signage. To successfully accomplish this goal, a spirit of cooperation will be required between the State of Tennessee, the Heritage Foundation, the City of Franklin, and local landowners.

*Notes***.** Unpublished reference sources used for this work include bound transcriptions and microfilm copies of Davidson and Williams County records at the Tennessee State Library and Archives in Nashville (originals in the Davidson County Courthouse in Nashville, and Williamson County Courthouse in Franklin). Also used were microfilm copies of 1830-1880 United States Census Reports for Tennessee Counties at the Tennessee State Library and Archives in Nashville.

Acknowledgments: This project was funded through a Federal survey and planning grant administered through the Tennessee Historical Commission and a grant from the Tennessee Wars Commission. In addition to six employees hired for the project, 78 volunteers, working in shifts of two or three per day, helped with the excavation.

References

Ball, Donald B.
1982 Chronological Implications of Window Glass Thickness and Coloration at the Linville Site (15BK12), Bracken County, Kentucky. U.S. Army Corps of Engineers, Louisville, Kentucky. Copy on file, Tennessee Division of Archaeology, Nashville.

Brown, J. Willard, A. M.
1896 *The Signal Corps, U. S. A. in the War of the Rebellion*. U. S. Veteran Signal Corps Association, Boston.

Connelly, Thomas L.
1994 *Civil War Tennessee, Battles and Leaders*. The University of Tennessee Press, Knoxville.

Dilliplane, Ty L.
1974 Fort Granger (Franklin, TN): A Study of Its Past and Proposal for Its Future. Report prepared for the National Park Service. Copy on file, Tennessee Division of Archaeology, Nashville.

1975 Exploratory Excavations at Fort Granger. Report prepared for Franklin Jaycees, Franklin, Tennessee and the National Park Service. Copy on file, Tennessee Division of Archaeology, Nashville.

Edwards, Jay D. and Tom Wells
1993 Historic Louisiana Nails, Aids to Dating of Old Buildings. *The Fred B. Kniffen Cultural Resources Laboratory Monograph Series No. 2*. Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

Foote, Shelby
1986 *The Civil War: A Narrative; Volume I, Fort Sumter to Perryville*. Vintage Books, New York.

Jones, Olive
1971 Glass Bottle Push-Ups and Pontil Marks. *Historical Archaeology*. Volume V, The Society for Historical Archaeology, Mackinac Island State Park Commission, Lansing, Michigan.

Lord, Francis A.
1965 *Civil War Collector's Encyclopedia*. Castle Books, New York.

Lynch, Louise Gillespie
1977 Miscellaneous Records of Williamson County, Volume 1. Published by the author.

Marshall, Park
1970 Collection of Writings by Park Marshall. Tennessee State Library and Archives, Nashville.

Merrill, William E.,
1863 Report of William Merrill on Defenses at Franklin, National Archives, Record Group 77, Records of the Office of the Chief Engineer, Letters Received, Microfilm 4321.
1864 "Block House Sketches," Manuscript Accession Number 267. Buell-Brien Papers, Tennessee State Library and Archives, Nashville.
1875 Development of the Blockhouse in the Civil War. In Van Horne, A History of the Army of the Cumberland. Volume 2.

Meyers, Danielle F.
2001 Phase III Archaeological Testing of Site 40KN150 in the Proposed State Route 131 (Emory Road) Corridor from Near Gill Road to Near Bishop Road, Knox County, Tennessee. Center for Transportation Research, The University of Tennessee, Knoxville. Copy on file, Tennessee Division of Archaeology, Nashville.

Moir, Randall W.
1987 Socioeconomic and Chronometric Patterning of Window Glass. In *Historic Buildings, Material Culture, and People of the Prairie Margin: Architecture, Artifacts, and Synthesis of Historic Archaeology*, edited by David H. Jurney and Randall W. Moir, pp. 73-81. Richland Creek Technical Series. Archaeology Research Program, Southern Methodist University, Dallas, Texas.

Newman, T. Stell
1970 A Dating Key For Post-Eighteenth Century Bottles. *Historical Archaeology*. Volume IV, The Society for Historical Archaeology, Moravian College, Bethlehem, Pennsylvania.

OR (1880-1901)
The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies. Government Printing Office, Washington, D. C.

Sayers, Edward B.,
1863 Untitled map of Signal Stations between Franklin and Murfreesboro. Map No. 71, McGaw Collection, Vanderbilt University Library, Special Collections. Sketch copy on file, Tennessee Division of Archaeology, Nashville.

Scott, H. L., Colonel
1864 *Military Dictionary*. D. Van Nostrand, New York.

Smith, Samuel D.
1994 Excavation Data for Civil War Era Military Sites in Middle Tennessee. *Look To The Earth*, edited by Clarence R. Geier, Jr. and Susan E. Winter. The University of Tennessee Press, Knoxville.

Smith, Samuel D. and Benjamin C. Nance
2000 *An Archaeological Interpretation of the Site of Fort Blount, A 1790s Territorial Militia and Federal Military Post, Jackson County, Tennessee*. Research Series Number 12, Tennessee Division of Archaeology, Nashville.

2003 *A Survey of Civil War Era Military Sites in Tennessee*. Research Series Number 14, Tennessee Division of Archaeology, Nashville.

South, Stanley
1977 *Method and Theory in Historical Archaeology*. Studies in Archaeology, Academic Press. New York.

Sword, Wiley
1992 *Embrace an Angry Wind, The Confederacy's Last Hurrah: Spring Hill, Franklin, and Nashville*. Harper Collins Publishers, Inc., New York.

Benjamin C. Nance
Tennessee Division of Archaeology
Cole Building #3
1216 Foster Avenue
Nashville TN 37210

DEEP TESTING METHODS IN ALLUVIAL ENVIRONMENTS: CORING VS. TRENCHING ON THE NOLICHUCKY RIVER

Sarah C. Sherwood and James J. Kocis

Deep testing by trenching is a standard field method used to investigate the potential for deeply buried surfaces or archaeological deposits in alluvial environments in the eastern US. This technique, however, can be both destructive and dangerous. We review the use of hydraulic coring in combination with microartifact analysis as an alternative to deep testing. A Phase II study on the Nolichucky River is used to directly compare trenching vs. coring and their effectiveness in providing data needed to identify buried sites in a floodplain and terrace environment. When combined with microartifact analysis and detailed description, the hydraulic coring protocols provided a qualitative and quantitative measure for the presence of buried surfaces that extend significantly deeper than trenches can efficiently reach..

Deep testing by trenching is a standard field method used to look for deeply buried archaeological deposits in alluvial environments. In the southeastern United States, mechanical trenching by backhoe has become the preferred method for the identification and examination of such sites, as is evidenced in various state guidelines (e.g. Simms 2001; West Virginia Division of Culture and History 1991). However, there are significant and often overlooked disadvantages to trenching that can be mitigated through the use of hydraulic coring, combined with microartifact analysis, as an alternate deep testing method. Although mechanized coring has been advocated by archaeologists in numerous contexts to identify deeply buried surfaces (e.g. Canti and Meddens 1998; McManamon 1984; Schuldenrein 1991; Stein 1986), it remains an underutilized tool to explore the potential and nature of buried archaeological sites in alluvial and colluvial contexts of the Southeast.

The first disadvantage of deep testing by trenching is a concern for worker safety. When a trench is excavated, the structural balance of a soil or deposit is always disrupted – creating the potential for collapse. This potential is compounded by soil type, vibrations from construction equipment, groundwater fluctuations, and prolonged exposure of the profile. Shoring or shield systems can protect against collapse, but typical survey trenches are open for only a brief time, making the time required to install these protective measures expensive and unrealistic.

A second disadvantage of trenching arises from the amount of excavation required to safely investigate deeply buried deposits. For example, to excavate a trench three meters deep, one meter wide, and ten meters long, approximately 110 cubic meters of soil would need to be removed to create "benches" that remain within safety guidelines for trenching and excavation established by the Occupational Safety and Health Administration (OSHA).[1] This amount of soil/sediment equals approximately 30 loads for a typical single-axle dump truck. This volume of material is rarely systematically examined.

From a cultural resources perspective, coring is a safer, more efficient, and cost effective method that can be used to identify deeply buried strata, and results in minimal disturbance to a project area and potentially significant buried archaeological deposits. In this article we briefly explore the benefits of coring (relative to trenching) as a method in deep archaeological survey. We use a case study on the Nolichucky River in Greene County, Tennessee, to examine the results of both methods.

Coring

In archaeology, coring evolved along with the development of new questions and technological advancements in field methods. The earliest equipment typically consisted of hand augers with extensions (still routinely used) and, less often, commercial drilling rigs. Stein (1986) offers a detailed look at the history of coring in archaeology and a description of the types of techniques available. She distinguishes two periods, beginning with the late 1930s to 1950s, when coring was used prior to radiometric techniques to build relative chronologies in the Mississippi Delta region. During the latter period of the mid-1960s, cores and augers began to play a key role in the exploration of subsurface deposits for site reconstruction and the collection of controlled samples for chemical, biological and ^{14}C analyses (Stein 1986:509). At this time truck-mounted hydraulic soil sampling rigs also began to appear in archaeological research programs. By the early 1980s, cores and augers were used to assess site structure or the depth and nature of cultural deposits in a growing number of intersite applications (e.g. Hoffman 1993; Polhemus 1982; Stein 1982; Whittacker and Stein 1992). Further, Canti and Meddens (1998:100) propose several ways in which coring can assist archaeologists, including delineating a site, mapping paleotopography, confirming geophysical results, and the systematic collection of paleoenvironmental samples on- and off-site.

Today, hydraulic-powered direct-push devices can be used in various contexts. The equipment and skilled operators can be subcontracted through drilling companies and the abundant environmental and geotechnical companies currently operating across the country. The direct-push machines use hydraulic pressure in conjunction with a rotary hammer to push a sampler below the ground surface to a desired depth. The devices are self contained and either mounted to four-wheel-drive truck beds or track-mounted for rough terrain.[2] Hydraulic rigs such as the Giddings® and Geoprobe® are ideal in alluvial, colluvial, and urban environments where deposits are often greater than two meters in depth. In urban settings coring can be especially important when thick modern fill layers overlay potentially significant earlier historic layers or soil surfaces (Schuldenrein 1991).

In compliance situations, where a project area may have very strict boundaries or limitations, these machines can be highly maneuverable and compact. In areas sensitive because of ecological and/or viewscape concerns, hydraulic coring is preferred over trenching because it has minimal surface impact and creates almost no visual disturbance to the landscape (e.g. mounded dirt, damaged vegetation). For example, in our experience coring in the Great Smoky Mountains National Park, the method articulated well with wider resource management concerns such as biological conservation and consideration of the visitor experience (Sherwood and Kocis 2005).

In large-scale surveys, coring can target areas for additional testing by identifying paleosols or deeply buried cultural deposits. Even landscapes once thought inaccessible, such as those inundated by water, can be cored using auger rigs placed on floating barges. This is particularly important in the Southeastern United States where large floodplain landscapes have been inundated due to reservoir construction. Using more traditional archaeological techniques, we have only limited access to deposits that nevertheless can contain valuable proxy data for paleoenvironmental reconstruction as well as significant archaeological deposits. Coring provides a tool to access these hidden landscapes. For example, in a recent study where an inundated portion of the Tennessee River floodplain was slated for destruction by bridge construction, Kocis (2005) was able to examine buried soils with intact morphology and archaeological deposits using cores.

Core diameters typically available for hydraulic rigs vary between one to six inches (ca. 2.5-15 cm). Several factors affect the size of the sampling tube, including the density of the material, related friction, and the weight of the coring rig. Texture is also important since most narrow tubes (less than two inches/five centimeters) will not be able to extract samples in dense, gravelly sediments.

Sampling tubes range from “split spoon tubes” that come apart producing a section of soil to “solid sampling tubes” that extrude a solid core. If the project requires real-time results and there is time to describe the sample in the field, then the split spoon or direct extrusions are appropriate. If time is an issue and the equipment is available for only a limited period, then the use of acetate sleeves or liners in solid tubes is more desirable. Sleeves and liners can be quickly removed, labeled and oriented in the field, and then taken to the lab to be opened, described, sampled, and/or stored. If they are sealed well in the field and stored in a cool dark place, they can be curated for many years.

Coring does have limitations, including the often-cited cost of the equipment (e.g. Canti and Meddens 1998; Stein 1986).[3] Nonetheless, the ability to extract cores methodically in acetate liners significantly increases efficiency while decreasing cost. Another limitation of coring is compaction due to friction caused by the push of the tube into the ground. Careful recording of depths in the field and lab, along with the disposal of mixed sections can mitigate this limitation. Experienced geoarchaeologists and pedologists can easily identify this disturbance and factor it into the protocol for core description and sampling. Canti and Meddens (1998:104) also offer calculations that can be used to correct for displacement due to compaction. These caveats in mind, the beneficial aspects of hydraulic coring for exploring deep stratigraphy theoretically outweigh the limitations. In an effort to test this argument, we compare the results of coring versus trenching in the following case study.

The Nolichucky River Study

Systematic comparison of trenching and coring was carried out as part of Phase II testing at the Birdwell site (40GN228), a multi-component site on the Nolichucky River in Greene County, Tennessee (Figure 1). While previously identified during Phase I testing, the vertical extent of archaeological deposits at the site were unknown. The proposed construction of a new bridge and approaches by the Tennessee Department of Transportation (TDOT) was determined to have the potential for impacts on the site. Phase II investigations sponsored by TDOT were conducted by MACTEC Engineering and Consulting, Inc. with Carey Oakley as Principal Investigator, Bradley Creswell as Field Director, and Sarah C. Sherwood directing the geoarchaeological field and

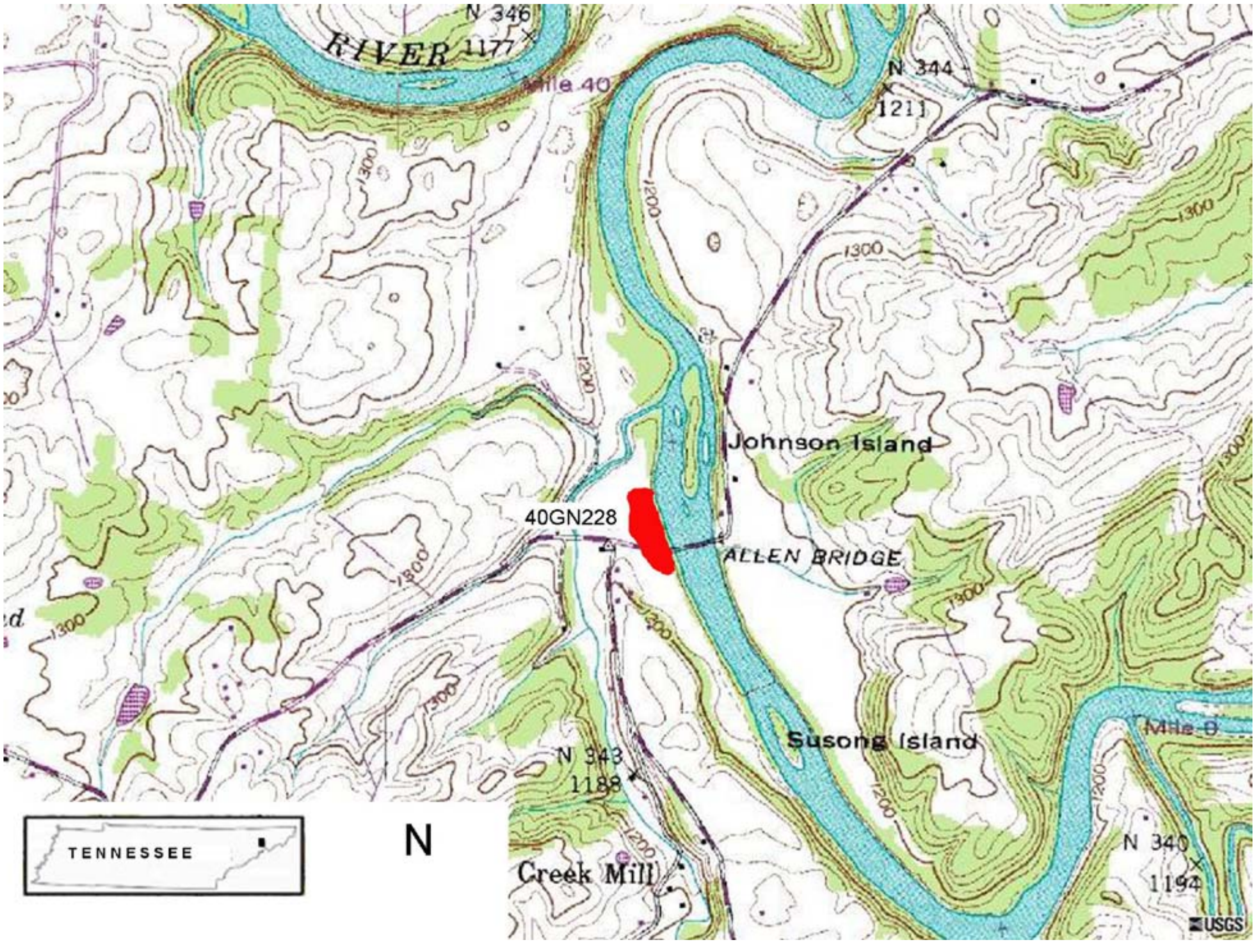

FIGURE 1. Location of the Birdwell Site (USGS Cedar Creek 7.5' Quadrangle, 181SW, 1966).

laboratory analyses.

Greene County is situated in northeast Tennessee adjacent to the Unaka Mountains and the North Carolina border, within the Valley and Ridge physiographic province. With a narrow and irregular floodplain, the Nolichucky River feeds into the French Broad River as part of the larger Tennessee River Valley. Underlying geologic formations are part of the Cambrian and Ordovician Conasauga and Knox Groups, composed of dolomite with minor shale and chert components (Hardemann 1966). The soils mapped throughout the area are Holocene age Entisols (young soils, developed in unconsolidated parent material). In general these soils are deep, well-drained micaceous sandy loams on nearly level to gently sloping floodplains (Edwards 1958; USDA-NRCS 2002). In the project area, these soils continue across the floodplain and up the low first terrace to the east. The presence of entisols adjacent to the river indicated a high probability for deeply buried soils. Both coring and trenching were planned for the project, providing an opportunity to compare the two deep testing methods. In addition to examining the presence and nature of buried deposits, we had two supplementary methodological objectives.

The first objective was to explore the use of microartifact analysis in concert with core descriptions to identify buried archaeological deposits. As the most abundant kind of artifact in the archaeo-

FIGURE 2. MACTEC operation of Geoprobe 5400® during the project.

logical record, microartifacts provide large sample sizes for strengthened quantitative analyses even in the sparsest of sites, and are more reliable indicators of archaeological sites in survey contexts relative to macroartifacts (Dunnell and Stein 1989, Fladmark 1982; Sherwood 2001). Microartifacts have also proven to be reliable for identifying buried deposits (Stafford 1995) and delineating activity areas and intrasite spatial structure (Metcalf and Heath 1990; Rosen 1993; Sherwood et al. 1995; Simms and Heath 1990). A second methodological objective was to compare profiles and descriptions of cores to those from comparable trenches placed across the project area.[4]

Methods

Cores were collected using a four-wheel drive, truck-mounted Geoprobe 5400® owned and operated by MACTEC Engineering and Consulting, Inc. (Figure 2). Two types of coring devices were used: a) four-inch (ten-cm) diameter split-spoon sampler (60-cm in length), and b) a two-inch (five-cm) diameter macrosampler with an acetate liner (115-cm in length). When the ten-centimeter diameter cores were extracted in the field they were placed on a specially designed calibrated table for viewing the articulated sections by depth and to facilitate sample collection (Figure 3). All profiles and cores were described using standardized soil descriptions including Munsell color, texture, structure, lower boundary (when discernable), and pedogenic or cultural features (Soil Survey Division Staff 1993). Coring began on the eastern edge of 40GN228 adjacent to the Nolichucky River and continued at 20-m intervals perpendicular to the river. A total of three four-inch (ten

FIGURE 3. Four-inch core removed from split spoon and placed into the ARL table designed to facilitate the field description, photo-documentation, and sampling of core sections.

cm) cores and one two-inch (five cm) core was extracted (Figure 4). Bulk samples for microartifact analysis (bagged and labeled by core depth) were collected in 20-cm increments unless a lithological change or disturbance was noted. Laboratory protocols used to process these samples were based on designs by Sherwood (2001) and Stafford (1995) and are detailed in the technical report (Oakley et al. 2003:56-58).

Trenching was completed using a backhoe equipped with a one-meter wide straight-edge bucket. Trenches were stepped or "benched" away from the working profile when depths exceeded 1.5 meters. An egress ramp was excavated at one end of the trench. All trenches were excavated perpendicular to the river in order to maximize the soil profile relative to the landscape variation. Location of the trenches was determined based on the landform and restrictions of the right-of-way. Seven trenches designated as G through M were excavated (Figure 4). When they intersected cultural features (in the western portion of the project area), they were terminated. Although trenches and cores were not consistently adjacent to one another, they represent the same section of the landform and are matched accordingly.

The Phase II study also included the excavation of one-by-two meter test units as extensions of profiles for Trenches J, H, and G (Figure 4). Results from these excavation units were used to confirm the interpretations drawn from the trench pro-

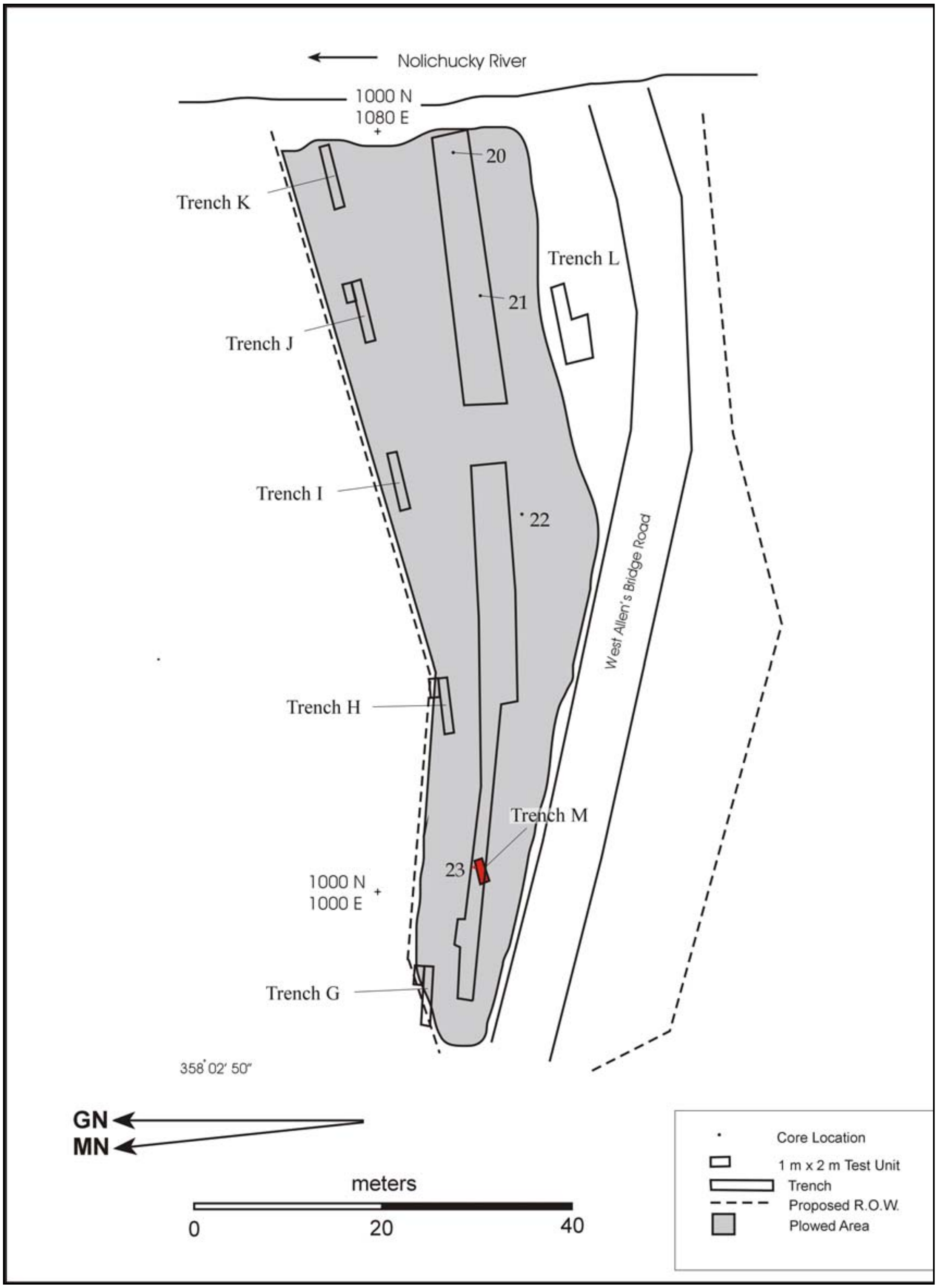

FIGURE 4. Project area limits showing test units, backhoe trenches, and core locations.

files and to provide data on artifact density and chronological control from diagnostic artifacts (see Oakley et al. 2003).

FIGURE 5. West profile of Trench M showing sequence of alluvial deposits with minimal soil development (scale in photograph = 2 m).

Results

The subsurface testing methods indicate deeply buried sequences on both the floodplain and the first terrace. This sequence generally consists of variable alluvial deposits with minimal soil development evidenced in numerous AC horizons (Figure 5). While coring and deep trenching both reveal buried deposits at the Birdwell site, only the coring was able to identify the deepest deposits.

The floodplain in the project area is approximately 40 m wide from the riverbank to the gentle slope up to the first terrace. On the floodplain, the results from descriptions of Cores 20, 21 and 22, the microartifact distributions, and the trench profiles all reveal the location of four buried A horizons. The cores identify at least two additional buried soils that the trenches were unable to explore due to depth restrictions.

On the first terrace, above the floodplain, it was difficult to find a place to excavate a deep trench that did not intersect cultural features immediately beneath the plow zone. Core 23 and Trench M were placed adjacent to one another, offering an excellent opportunity to directly compare their results (Figure 6). Both exhibit several buried A horizons with only slight variations in the profile measurements that may be due to the variable surface instead of variable depths, or to slight compression in the core (Core 23 was collected using a two-inch diameter sampling tube). Wherever variation appeared it typically measured less than ten cm. Horizon 3Ab (Trench M) was a faint incipient A that that was not observed in Core 23 (Figure 6). The microartifact data spikes at 175-200 centimeters below surface (cmbs), correlate with a fifth buried A (5Ab) identified in both the trench and the core. In the trench, macro-debitage was observed in the profile at this depth as well. Towards the base of this horizon (about 225 cmbs), horizon 5Ab contained charcoal, debitage and a flake tool. No micro- or macro-ceramics appear greater than 200 cmbs in the core or the trench (Oakley et al. 2003). The presence of debitage and the absence of ceramics suggest a possible Archaic component older than the sequence observed in the floodplain data (the earliest deposits in the floodplain trenches were dated to the Woodland Period). Core 23 was able to extend beyond the depth of Trench M, and identified one more buried soil at 400 cmbs. Probable microdebitage was

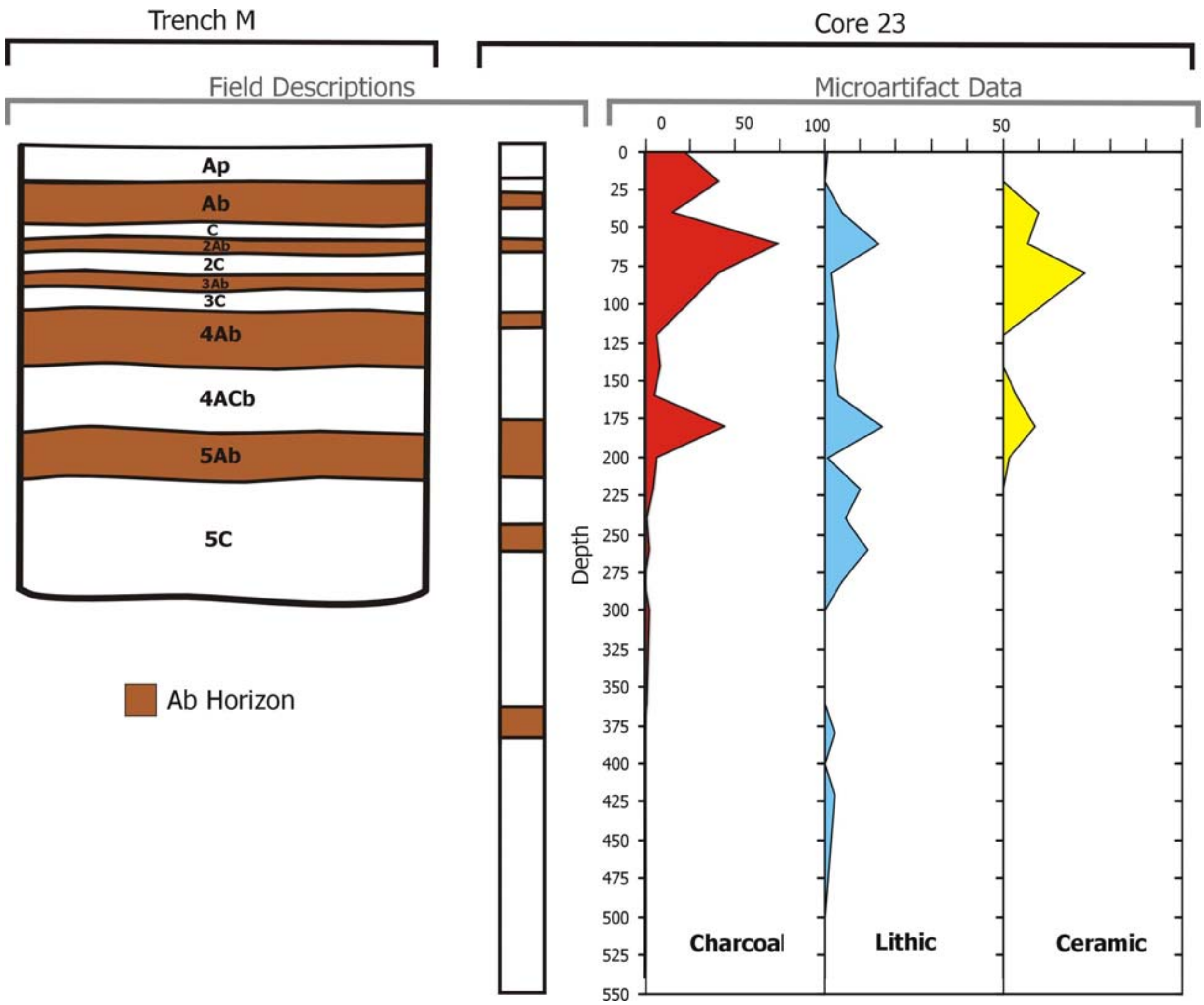

FIGURE 6. Diagrammatic comparison of Trench M and Core 23.

recovered just above and below this depth, but very little charcoal was observed (Figure 6). Core 23 also provides an apparent base of the terrace soils, with the presence of sand and gravel beginning at 540 cmbs. While we cannot confirm another buried cultural component at 400 cmbs, there is a buried surface present based on the soil description, and there remains the potential for buried archaeological deposits to this depth. The Trench M profile was only excavated to 300 cmbs where artifacts continued to appear in the profile.

Discussion and Conclusions

In the Nolichucky case study, the deep trenches and cores yielded comparable descriptions. As indicated by Stafford (1995), the microartifacts also proved to be reliable indicators of buried surfaces, and in most cases, archaeological deposits.

Based on the coring and trenching results it is clear that there are deeply buried deposits in both the floodplain and the first terrace. Figure 7 summarizes the project coring and trenching data in addition to the general temporal information ob-

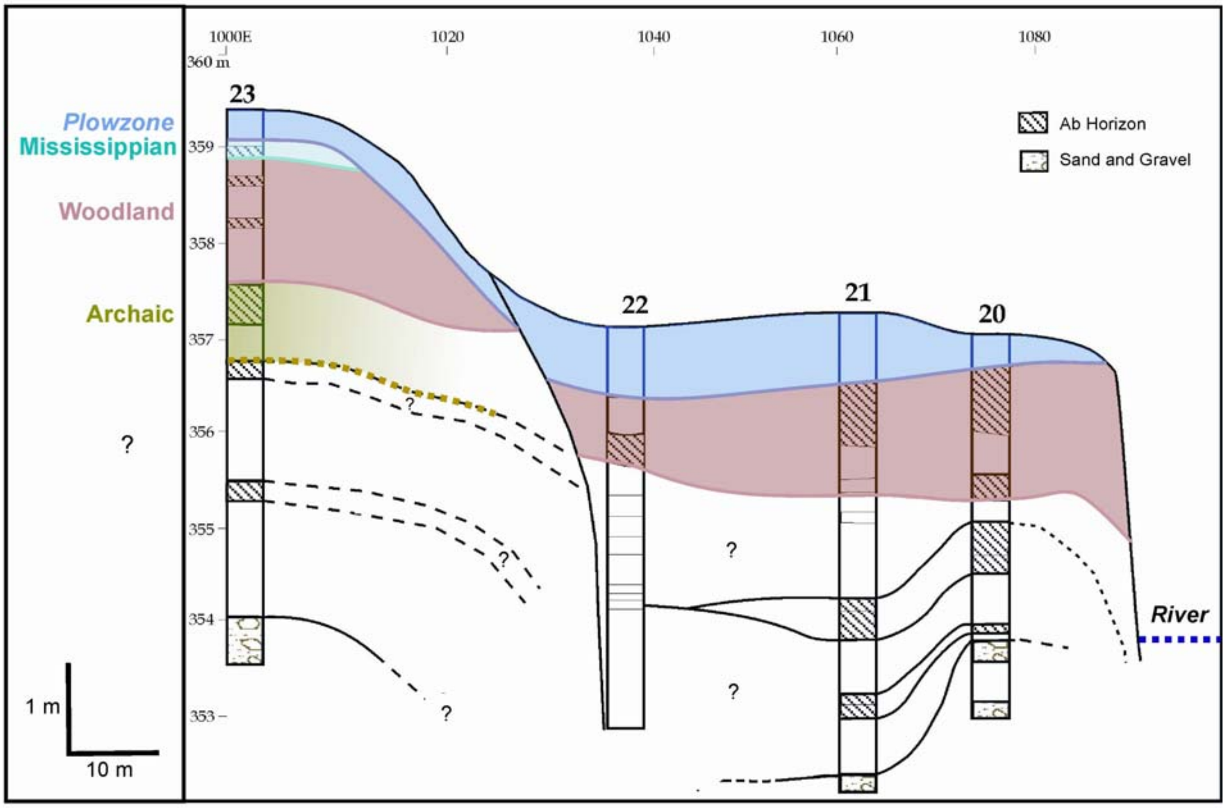

FIGURE 7. Schematic cross-section through the project Area with the cultural periods (based on test unit data) overlying core results.

tained in the test units (see Oakley 2003). Note that the buried surfaces revealed in the cores continue below the limits of the temporal data, suggesting earlier deposits may be located within the site. In the case of Core 23, the microartifacts provide evidence for human activity, and the core data indicates the base of the terrace deposits. This information was not available from the trench because of the extreme depth. To remain within OSHA guidelines, trenching to this depth would have required stepped benches opening up nearly the entire width of the proposed right-of-way, destroying the significant upper archaeological components.

During this project, the four-inch (ten-cm) diameter split-spoon sampler provided for better description of pedogenic features and horizon boundaries compared to the two-inch (5-cm) diameter sampler. Compression was minimal and the larger diameter allowed for incorporation (and therefore description) of coarse materials. However, with increased size, greater resistance occurred with depth so the ten-cm diameter sampler could rarely be used past two to four meters. At greater depths, the two-inch (5-cm) sampler was required.[5] Due to the length of the sampler (60 cm), collection time may also become an issue as it necessitates more core sections to reach the same depth. The two-inch (5-cm) diameter macrosampler with acetate liner reached much greater depths (e.g. Core 23 = 5.5 m) and used a longer sampler. Subsequent to the methodological study on the Nolichucky River we have refined our coring approach in the river valleys and colluvial slopes of the Midsouth using a three-inch (7.6 cm) macro-sample tube that produces a 115-cm section within an acetate sleeve. This diameter can be pushed to great depths in typical alluvium, provides an adequate sample amount for various analyses, and the integrity of pedogenic features it affords facilitates comprehensive soil morphology descriptions.

The direct correlation between the sources of soil data that are demonstrated here suggests that coring provides comparable results to backhoe trenching with substantially less destruction to potentially significant deposits and less danger to the field analyst. Coring is far safer, and can efficiently reach greater depths than trenching. The main benefit to trenching is the wider exposure it creates, providing for more detailed examination of stratigraphic boundaries, as well as the chance for identification of features or macroartifact concentrations to provide specific insights into the age of the deposits. This potential temporal benefit could be incorporated in the coring protocol through budget allocations for radiocarbon dating of charred material extracted from core. Closer spacing between cores can also provide more refined spatial data.

At the initial survey or Phase I level, where the primary goal of deep testing is to identify the potential for buried deposits, coring is an efficient and cost effective technique. This efficiency extends to its ability to identify buried surfaces/soils and, at a closer interval, the ability to isolate the limits of horizons or buried surfaces. We believe the most effective methodology in such circumstances would be to use coring data to target areas for conservative and specific trenching at the Phase I or Phase II level. This would maximize data recovery and the majority of the site would remain preserved or available for more detailed investigation.

Notes. [1] See U.S. Department of Labor, Occupation Safety & Health Administration Regulations (Standards - 29 CFR) for Sloping and Benching - 1926 Subpart P App B excavation guidelines. www.osha.gov.

[2] Track mounts are ideal for tight spots such as wooded areas and for soft, wet soils.

[3] We do not explore the option of purchasing a hydraulic coring device here, as most CRM companies are unable to dedicate these kinds of funds and maintenance to equipment that will not be used on a regular basis.

[4] While soil characterization data from samples collected in trench profiles and from cores should be directly comparable, it is often the case in Phase I and Phase II surveys where the costs of physical and chemical soil analyses are too prohibitive to be included in the budget. The results from deep survey methods therefore tend to derive from description and experienced field observation alone. Therefore, in this study we focused on the results of qualitative and semi-quantitative description.

[5] It is important to note that diameters of 7.6 and ten cm (three and four in) cannot push to such depths with smaller machines (typically trailer, cart or ATV mounted). These lighter machines do not have the weight or push to handle the resistance typically associated with this diameter at the depths expected in the regions alluvial soils.

Acknowledgments: We gratefully acknowledge TDOT for funding this project and MACTEC Engineering and Consulting, Inc. for allowing us to report our geoarchaeological results from the Phase II at the Birdwell Site. We appreciate Paul Avery and Will Hager who operated the Geoprobe and Carey Oakley and Brad Creswell, who directed the archaeological fieldwork. Thanks to Mike Angst, Boyce Driskell, Alan Longmire, and Hector Qirko, who offered helpful comments and editorial suggestions on earlier versions of this manuscript. We thank Kevin Smith, Mike Moore, and an anonymous reviewer for their thoughtful critique of the final paper.

References

Canti, M. G. and F. M. Meddens
1998 Mechanical Coring as an Aid to Archaeological Projects. *Journal of Field Archaeology* 25:97-106.

Dunnell, Robert C., and Stein, Julie K.
1989 Theoretical Issues in the Interpretation of Microartifacts. *Geoarchaeology* 4 (1):31-42.

Edwards, Max J.
1958 *Soil Survey of Greene County, Tennessee*. US Government Printing Office, Washington, DC.

Fladmark, Knut R.
1982 Microdebitage Analysis: Initial Considerations. *Journal of Archaeological Science* 9:205-220.

Hardemann, William, D.
1966 *Geologic Map of Tennessee*. State of Tennessee, Division of Geology, Nashville, TN.

Hoffman, Curtis
1993 Close-interval Core Sampling: Tests of a Method for Predicting Internal Site Structure. *Journal of Field Archaeology* 20:461-473.

Kocis, James J.
2005 Geoarchaeological Examination of Site 1JA77, An Inundated Site in Guntersville Reservoir, Scottsboro, Jackson County, Alabama. Report submitted to Office of Archaeological Research, The University of Alabama, Moundville, Alabama

McManamon, Francis Patrick
1984 Discovering Sites Unseen. In *Advances in Archaeological Method and Theory*, *Vol. 7*, edited by Michael Schiffer, pp. 223-292. Academic Press, New York.

Metcalfe, Duncan, and Heath, Kathleen M.
1990 Microrefuse and Site Structure: The Hearths and Floors of the Heartbreak Hotel. *American Antiquity* 55 (4):781-796.

Oakley, Carey B., Steven Meredith, Sarah Sherwood, Brad Creswell, Paul Avery, Robert E. Perry, James Kocis, Dan Weinand, Walter

Klippel, Suanne Zwilling
2003 Report of Phase II Archaeological Testing Sites 40GN228 and 40GN229 Greene County, Tennessee. Prepared for Tennessee Department of Transportation, Nashville, TN.

Polhemus, Richard R.
1982 Small Diameter Cores: A Versatile Investigative Technique for the Field Archaeologist. Paper presented at the Conference of Historic Site Archaeology, Asheville, North Carolina.

Rosen, Arlene
1993 Microartifacts as a Reflection of Cultural Factors in Site Formation. In *Formation Processes in Archaeological Context*. edited by Paul Goldberg and David T. Nash and Michael D. Petraglia, pp. 141-148. Prehistory Press, Madison, WI.

Schuldenrein, Joseph
1991 Coring and the Identity of Cultural Resource Environments. *American Antiquity* 56:131-137.

Sherwood, Sarah C.
2001 Microartifacts. In *Earth Science and Archaeology*, edited by Paul Goldberg, Vance T. Holliday and C. Reid Ferring. Kluwer Academic/Plenum Publishers New York.

Sherwood, Sarah C. and James J. Kocis
2005 “The Geoarchaeological Phase I Evaluation of the proposed Cades Cove Opportunities Project, Great Smoky Mountains National Park, Tennessee. Report submitted to Mactec Engineering, Knoxville, TN.

Sherwood, Sarah C., Jan F. Simek, and Richard R. Polhemus
1995 Artifact Size and Spatial Process: Macro-and Microartifacts in a Mississippian house. *Geoarchaeology* 10 (6):429-455.

Simms, D.C.
2001 Guidelines for Archaeological Investigations and Reports in Mississippi, http://www.mdah.state.ms.us/hpres/archguidelines.pdf. Mississippi Department of Archives and History. Accessed August 13, 2006.

Simms, Steven. R., and Heath, Kathleen. M.
1990 Site Structure of the Orbit Inn: An Application of Ethnoarchaeology. *American Antiquity* 55:797-813.

Soil Survey Division Staff
1993 Soil Survey Manual – U.S. Department of Agriculture Handbook 18, Washington, D.C., U.S. Government Printing Office.

Stafford, C. Russell
1995 Geoarchaeological Perspectives on Paleolandscapes and Regional Subsurface Archaeology. *Journal of Archaeological Method and Theory* 2 (1):69-104.

Stein, Julie K.
1982 Geological Analysis of the Green River Shell Midden. *Southeastern Archaeology* 1:22-39.
1986 Coring Archaeological Sites. *American Antiquity* 51(3):505-527.

USDA-NRCS
2002 "Official Soil Series Descriptions". http://www.statlab.iastate.edu/cgi-bin/osd/osdnamequery.cgi. United States Department of Agriculture – Natural Resource Conservation Service.

West Virginia Division of Culture and History
1991 Guidelines for Phase I Surveys, Phase II Testing, Phase III Mitigation and Cultural Resources Reports. http://1991_WVSHPA_Guidelines.rtf.

Whittacker, Fran H., and Julie K. Stein
1992 Shell Midden Boundaries in Relation to Past and Present Shorelines. In *Deciphering a Shell Midden*. edited by Julie K. Stein, pp. 25-42, Academic Press, San Diego, California.

Sarah C. Sherwood
Archaeological Research Laboratory
The University of Tennessee
Knoxville, Tennessee 37921

James J. Kocis
Archaeological Research Laboratory
The University of Tennessee
Knoxville, Tennessee 37921

A PRELIMINARY ANALYSIS OF CLOVIS THROUGH EARLY ARCHAIC COMPONENTS AT THE WIDEMEIER SITE (40DV9), DAVIDSON COUNTY, TENNESSEE

John Broster, Mark Norton, Bobby Hulan, and Ellis Durham

Recent archaeological work by the Tennessee Division of Archaeology at the Widemeier site (40DV9) has uncovered an extensive amount of evidence for Paleoindian and Early Archaic occupations. Paleoindian specimens recovered from the site area include Clovis and Cumberland projectile points along with blade tools, blades, and blade cores. Early Archaic projectile points include Harpeth River, Big Sandy I, Kirk Corner-Notched, and Lost Lake. These artifacts likely derived from a series of small extractive camps placed around small streams and springs overlooking an earlier oxbow of the Cumberland River.

The Cumberland Research Group, Inc. undertook archaeological investigations at the Widemeier site (40DV9) in August of 2005 to determine if human burials would be impacted by the construction of two large ponds adjacent to the Cumberland River and SR-12/Ashland City Highway (Figure 1). A Mississippian component was known to exist within the proposed Pond #2 boundary. A series of 30-meter trenches were excavated to examine potential burial areas. Two possible Mississippian period stone-box graves were found along the margins of the larger proposed pond, but both could be avoided during pond construction. A scatter of lithic debitage and a few late Paleoindian and Early Archaic artifacts were recovered from the trenches in the proposed Pond #1 area. However, no intact archaeological features were noted, and investigations were terminated as the conditions of the contract had been met (Allen 2005).

Personnel from the Tennessee Division of Archaeology felt that additional work at the site would be rewarding. The Division was permitted to conduct a continuous archaeological evaluation of the property during the construction activities. Accordingly, backdirt from several of the trenches was sifted for artifacts, and additional excavation units were excavated to sterile clay. A total of 13 square meters was examined to a maximum depth of 90 centimeters below surface. A high concentration of Paleoindian and Early Archaic artifacts were encountered. The Early Archaic levels yielded a considerable amount of charcoal. A very small amount of charcoal was removed from the less dense Clovis occupation level.

Clovis, Cumberland, Beaver Lake, Dalton, and Greenbrier projectile points were found in both the previously excavated trenches and the new excavations (Figures 2 and 3). Additionally, Paleoindian projectile points and tools were collected during the commercial dirt removal from both pond areas. Early Archaic projectile points were even more numerous, and contained the following types: Harpeth River, Big Sandy I, Kirk Corner-Notched, Pine Tree Corner-Notched, Decatur, Lost Lake, Plevna, and Hardin Barbed (Tables 1 and 2; Figures 4 and 5).

Blade tools, blades, and blade cores, probably associated with the Clovis and Cumberland occupations, were extremely numerous (Table 3). The blade tools, found throughout both pond areas, consisted of spurred end scrapers, side scrapers made on blades, and blade knives (Figures 6 and 7).

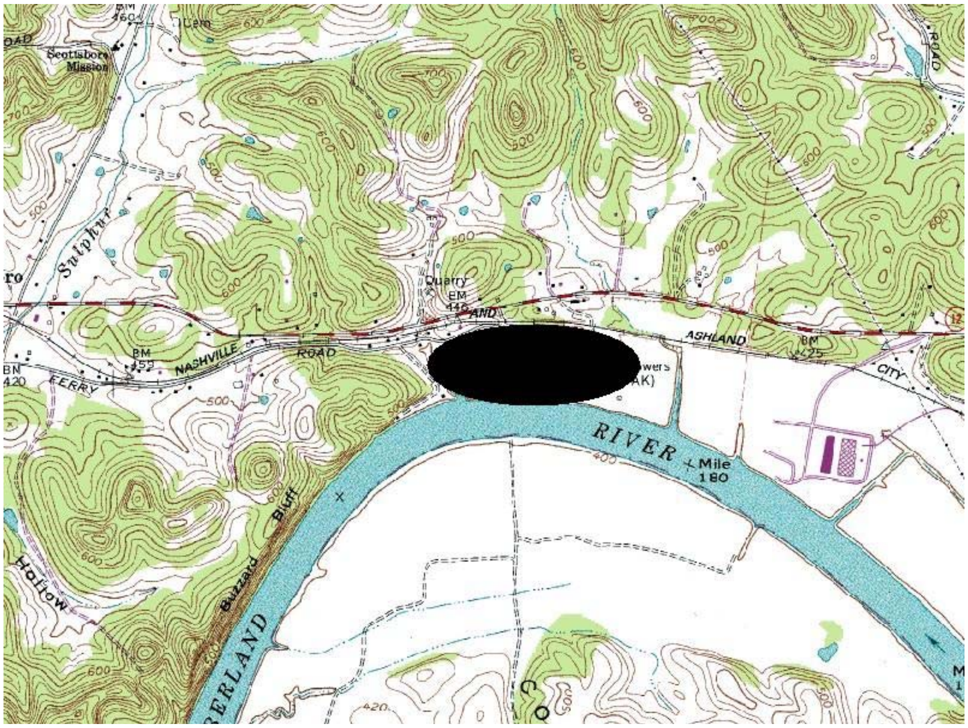

FIGURE 1. Location of 40DV9 (USGS Scottsboro 7.5' Quadrangle, 308 NW).

FIGURE 2. Paleoindian projectile points: (A) Clovis; (B) Unfluted Clovis; (C-E) Beaver Lake; (F) Unfluted Cumberland; (G) Dalton.

FIGURE 3. Clovis Preforms.

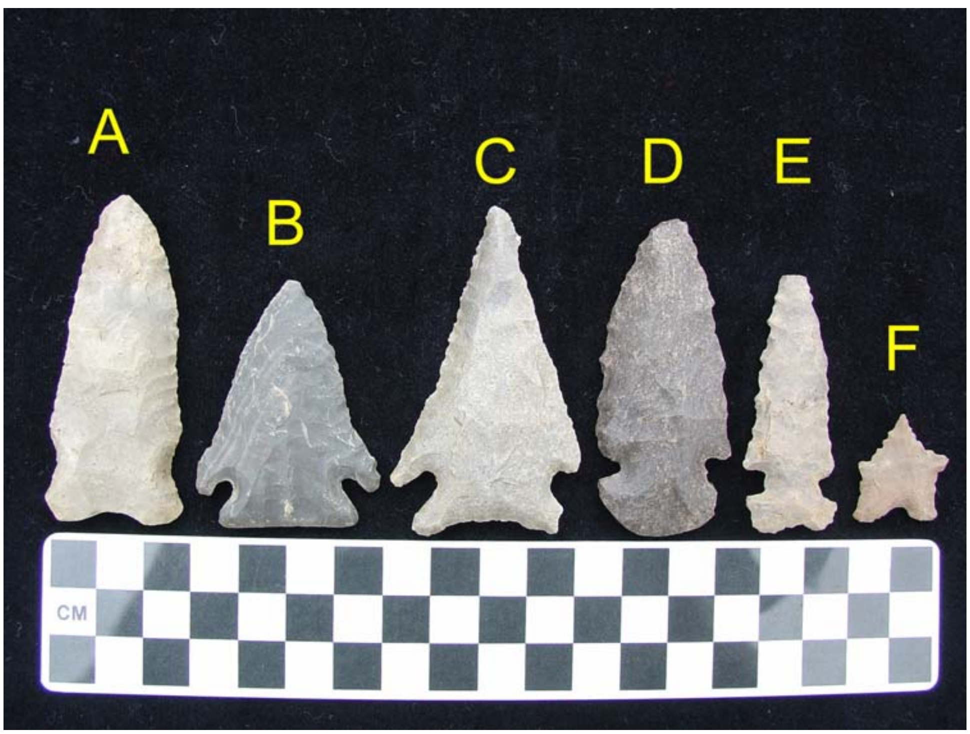

FIGURE 4. Early Archaic projectile points: (A) Greenbrier; (B) Kirk Corner-Notched; (C) Lost Lake; (D) Plevna; (E) Big Sandy; (F) Lecroy.

FIGURE 5. Cobbs Knives.

FIGURE 6. End scrapers.

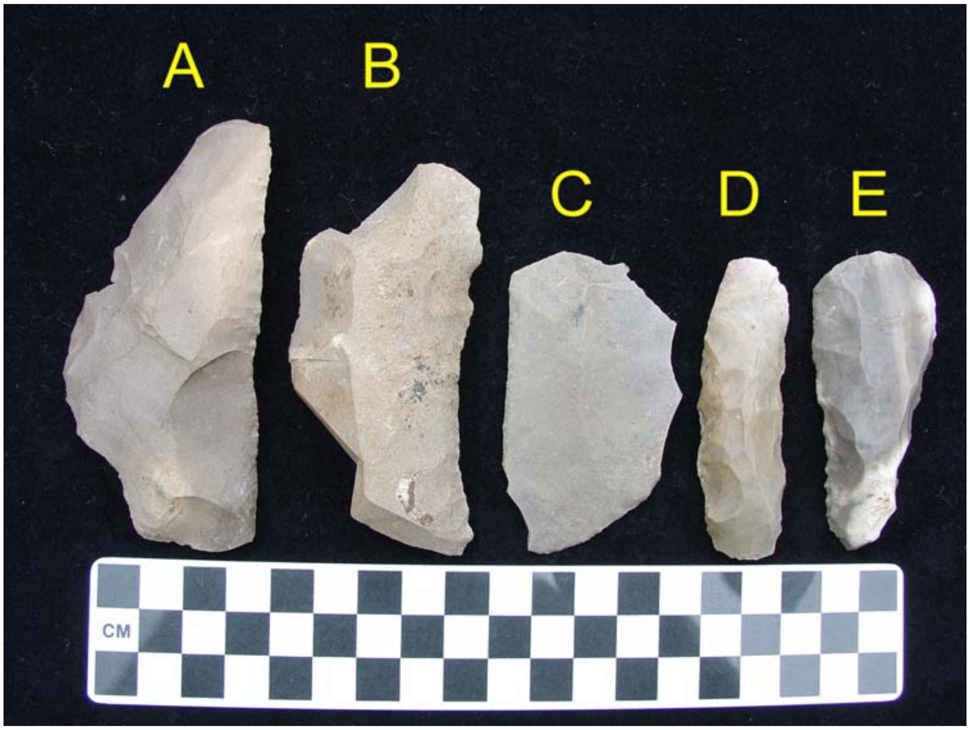

FIGURE 7. Uniface blade tools: (A-C) Knives; (D) Side scraper; (E) Side scraper/End scraper.

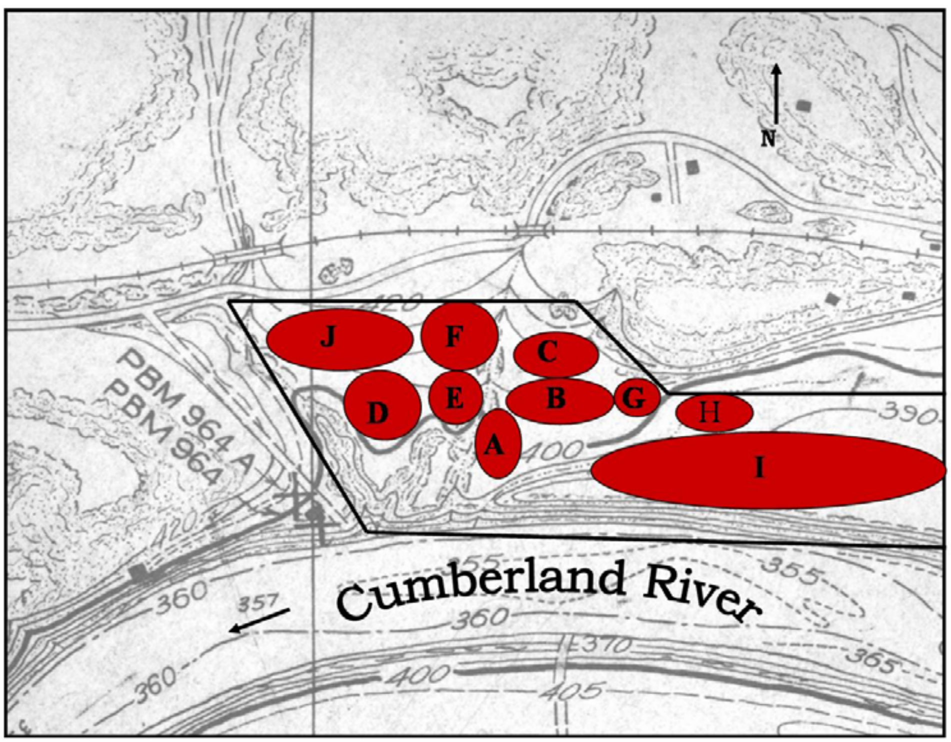

FIGURE 8. 40DV9 Artifact concentration areas.

TABLE 1. Paleoindian Projectile Points/Knives.

	A	B	C	D	E	F	G	H	J	Totals
Clovis	0	0	0	2	0	1	0	0	0	**3**
Unfluted Clovis	0	0	0	1	0	0	0	0	0	**1**
Clovis Knives	0	0	1	0	0	1	0	0	0	**2**
Channel Flake	0	0	0	2	0	0	0	0	0	**2**
Clovis Preform	0	4	0	17	4	2	3	0	1	**31**
Cumberland	0	0	0	0	0	2	0	0	0	**2**
Unfluted Cumberland	0	1	0	0	1	2	0	0	0	**4**
Beaver Lake	0	0	0	3	1	2	0	0	0	**6**
Dalton	0	0	0	1	0	0	0	0	0	**1**
Dalton Preform	0	0	0	1	0	0	0	0	0	**1**
Totals	**0**	**5**	**1**	**27**	**6**	**10**	**3**	**0**	**1**	**53**

TABLE 2. Early Archaic Projectile Points/Knives.

	A	B	C	D	E	F	G	H	J	Totals
Greenbrier	0	0	1	18	0	1	0	0	0	**20**
Harpeth River	0	1	0	1	0	0	0	0	0	**2**
Big Sandy 1	1	1	1	10	2	8	0	0	0	**23**
Kirk Corner-Notch	0	3	7	40	13	4	0	1	2	**70**
Lost Lake	0	3	5	8	0	0	0	0	1	**17**
Plevna	0	0	0	2	0	0	0	0	0	**2**
Decatur	0	1	2	0	0	0	0	0	0	**3**
Lecroy	0	1	0	0	0	0	0	0	0	**1**
Cobbs Knife	0	1	2	9	2	1	1	0	0	**16**
Totals	**1**	**11**	**18**	**88**	**17**	**14**	**1**	**1**	**3**	**154**

TABLE 3. Uniface Blade Tools, Biface Preforms, and Projectile Point Fragments.

	A	B	C	D	E	F	G	H	J	Totals
Endscraper	0	14	18	46	5	13	4	0	2	**104**
Spurred Endscraper	1	1	4	8	3	9	0	0	0	**26**
Teardrop Endscraper	0	0	1	4	2	1	0	1	0	**9**
Sidescraper	0	5	22	57	3	16	1	1	4	**109**
Blade Knife	0	4	7	52	1	9	0	1	2	**76**
Graver	0	3	6	24	0	8	1	1	5	**48**
Spokeshave	0	0	1	6	1	0	0	0	0	**8**
Denticulate	0	1	2	4	1	2	0	0	0	**10**
Outre passe flake	0	2	0	14	0	1	0	0	0	**17**
Blade	3	11	13	206	4	22	1	3	3	**266**
Core Tablet flake	0	0	1	0	0	0	0	0	0	**1**
Blade core	0	1	0	19	2	4	0	1	1	**28**
PPK fragment	0	4	11	43	3	21	0	0	9	**91**
Biface/ Preform	5	52	95	244	14	80	4	1	12	**507**
Totals	**9**	**98**	**181**	**727**	**39**	**186**	**11**	**9**	**38**	**1298**

Paleoindian and Early Archaic stratified levels were recorded in the Pond #2 excavations. A high density of these materials were observed in the Pond #1 area, but appear to be mixed within a 40 centimeter deposit (with Clovis, Dalton, Greenbrier, and Early Archaic projectile points found together).

To date, a total of eight concentrations of early materials (Areas A through H, and Area J) have been investigated (Figure 8). These concentrations appear to be small extractive camps placed around small streams and springs overlooking an earlier oxbow of the Cumberland River. The manufacture of bifaces and other hunting equipment can be postulated, based on the large numbers of broken performs and discarded projectile points. Additionally, spurred end scrapers and gravers denote the manufacture of spearshafts and foreshafts.

Lithic raw materials in the form of Ft. Payne chert cobbles are present in several buried streambeds on the property. These cobbles provided a ready resource of toolstone material. Almost all lithic debitage from the site comes from the Ft. Payne chert or locally available Bigby-Cannon and Brassfield cherts. Discarded projectile points from the Early Archaic period are also manufactured from these materials. In contrast, used and broken Paleoindian projectile points (especially Clovis) are derived from Dover and St. Louis cherts that originate north and northwest of the site. This fact may represent greater group mobility during the Early Paleoindian than the later Transitional Paleoindian and Early Archaic times.

Site 40DV9 should prove extremely important in understanding the Paleoindian and Early Archaic utilization of the Central Basin of Tennessee. Only one other early site has been professionally investigated in the Central Basin. The Johnson site (40DV400), tested by the Division of Archaeology in the mid-1990s, produced artifacts very similar to the Widemeier site assemblage (Barker and Broster 1996). Intact Clovis and Early Archaic components were examined, with dates obtained from both occupations. The Clovis dates are very interesting, in that they date prior to 11,500 radiocarbon years before present and are considered by some Paleoindian experts to be 200 to 500 years too old for Clovis in the Americas. In contrast, the Early Archaic dates fell between 8,800 and 9,200 radiocarbon years before present, and are quite within the range for Kirk/Pine Tree occupations in Tennessee (Broster et al. 1991; Broster and Barker 1992; Barker and Broster 1996).

Acknowledgments: The authors wish to thank Mr. Chad Meadows and Mr. Tony Tant of CJRT, Inc. for allowing us to continue research on this very important site. We would also like to thank heavy equipment operators Larry Duncan and Joey Smith for their considerable help in uncovering sensitive occupation levels with a minimal amount of damage.

References

Allen, Dan S. IV.
2005 Due-Diligence Archaeological Investigation of Proposed Areas on the Deborah C. Hicks Property, Davidson County, Tennessee. Manuscript prepared for CJRT, Inc. Cumberland Research Group. Nashville. Copy on file, Tennessee Division of Archaeology, Nashville.

Barker, Gary, and John B. Broster.
1996 The Johnson Site (40Dv400): A Dated Paleoindian and Early Archaic Occupation in Tennessee's Central Basin. *Journal of Alabama Archaeology* 42(2): 97-153.

Broster, John B., and Gary Barker.
1992 Second Report of Investigations at the Johnson Site (40Dv400): The 1991 Field Season. *Tennessee Anthropologist* 17(2): 120-130.

Broster, John B., David P. Johnson, and Mark R. Norton.
1991 The Johnson Site: A Dated Clovis-Cumberland Occupation in Tennessee. *Current Research in the Pleistocene* 8: 8-10.

John B. Broster
Tennessee Division of Archaeology
Cole Building #3
1216 Foster Avenue
Nashville TN 37210

Mark R. Norton
Tennessee Division of Archaeology
Cole Building #3
1216 Foster Avenue
Nashville TN 37210

Bobby Hulan
Ashland City, Tennessee

Ellis Durham
Madison, Tennessee