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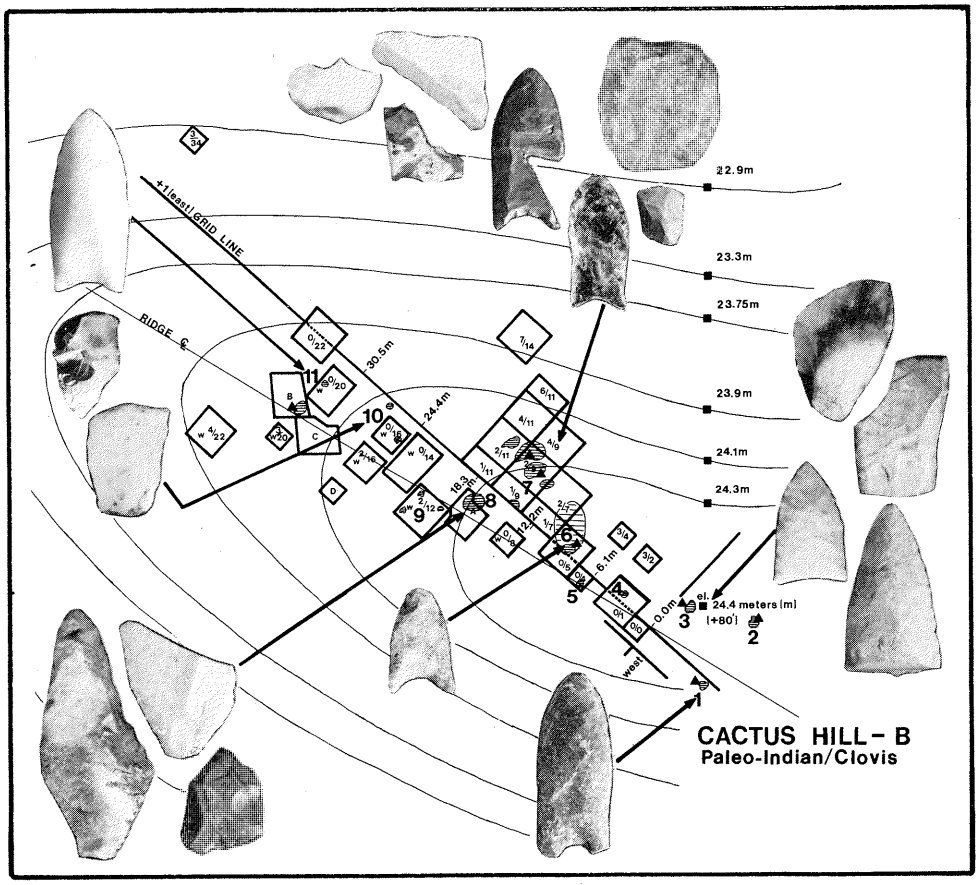
ARCHAEOLOGICAL INVESTIGATIONS OF SITE 44SX202, CACTUS HILL, SUSSEX COUNTY VIRGINIA



RESEARCH REPORT SERIES NO. 8

1997

Commonwealth of Virginia
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ARCHAEOLOGICAL INVESTIGATIONS OF SITE 44SX202, CACTUS HILL, SUSSEX COUNTY VIRGINIA

Virginia Department of Historic Resources

Research Report Series No. 8

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Nottoway River Survey Archaeological Research Report No. 2

1997

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The Cactus Hill Site discovery, data analysis, and report preparation and publication would not have been possible without the help of many people in each phase of this work. The site discovery and early investigation work are described in some detail in the main report, but special thanks are due the following Virginia residents: Mr. H. A. MacCord, Sr. of Richmond, Mr. Harold Conover and Mr. M. R. Lilley of Carson, David Collins of Carson, the Barr family of Petersburg, Mr. M. F. Johnson of Falls Church, Joyce Pearsall of Burke, and Lynn, Bryan and James McAvoy of Sandston.

Permission to conduct major excavations on the site was obtained through the efforts of Mr. R. E. Darden and Mr. W. J. Greenwald, of Union Camp Corp., Franklin, Virginia. I wish to express special thanks to the land owner, Union Camp Corp., for its overall cooperation and interest throughout the many years of this ongoing project. The Hickory Hunt Club, which leases the tract containing Cactus Hill, has always been friendly and helpful, and its cooperation greatly simplified the overall project.

Site preparation for excavation was accomplished in part by Mr. Guy Smith, a local private excavation contractor with an interest in archaeology. Site excavation was a volunteer effort undertaken by the Nottoway River Survey with the help of the Richmond Chapter and the Nansemond Chapter of the Archeological Society of Virginia. Mr. M. F. Johnson was aided in his work on Cactus Hill by the Northern Virginia Chapter of the Archeological Society of Virginia and the VCU Archaeology Club. Both the Nottoway River Survey and Mr. Johnson were aided by volunteers from the general public who had learned of the ongoing project. A listing of all volunteers (of record) who participated in the field excavation follows this formal acknowledgment. I would, however, like to express special thanks to Mr. Tim Shelor of Prince George, Virginia, Mr. H. B. Warren of Disputanta, Virginia, and Lynn, James, and Bryan P. McAvoy of Sandston, Virginia for the many continuous days of work they put in on the project for Nottoway River Survey.

The site was excavated as two independent projects. The Nottoway River Survey work was in site areas B and D, and Mr. M. F. Johnson's work was in area A. This allowed independent confirmation of the work of both groups, and the approach seems to have been quite successful. I gratefully acknowledge the work of Mike Johnson's team, and its dedication to the Cactus Hill project. Laboratory analysis work was managed by Johnson for the materials recovered in his work area of the site.

The Nottoway River Survey analyzed the lithics recovered in areas B and D of the site at the laboratory in Sandston, Virginia. Geological analysis of the Cactus Hill Site area was undertaken for Nottoway River Survey by G. H. Johnson and K. B. Jones of the Department of Geology of the College of William and Mary. Mr. Robert Hodges, a retired soils scientist, aided the William and Mary team. Its geological work on the site is continuing. Thomas R. Whyte of the Department of Anthropology of Appalachian State University, at the request of Nottoway River Survey, performed the particularly difficult analysis of the fragmentary and calcined faunal remains from areas B and D of the site. C. Margaret Scarry, then at the University of Kentucky, provided assistance with wood charcoal and seed analysis of samples from areas B and D. Cheryl A. Holt, private consultant, provided a floral analysis of flotation materials from several features in area D. Lucinda McWeeney, Department of Biology, Herbarium, at Yale University, is due special thanks for her efforts with the wood charcoal analysis from the early features in areas B and D on Cactus Hill. Much of the credit should be given to Lucinda for identification and analysis of the uncontaminated portion of the Clovis hearth sample from area B of the site. Financial support for the majority of the work referenced above was provided by the Virginia Department of Historic Resources.

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Mr. James P. McAvoy, while working as a student laboratory assistant at the Virginia Department of Historic Resources, undertook an analysis of the Woodland period and historic period artifacts recovered by Nottoway River Survey on Cactus Hill. We would like to thank Joanne Bowen, of the Colonial Williamsburg Foundation, for assisting in this part of the work by providing an analysis of the historic faunal component. Also, Mr. K. T. Egloff of the Virginia Department of Historic Resources helped with the identification of ceramics. Important information on early local land patents was supplied to Nottoway River Survey by Mr. Dennis Hudgins of Richmond, Virginia, and Mr. Gary Williams of Sussex, Virginia.

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Finally, I would like to express my most sincere appreciation to my co-author, Lynn D. McAvoy, for her support over the years of this project in the areas of fieldwork, artifact analysis, and report writing and processing. Without Lynn's support the project would not have been possible.

Joseph M. McAvoy

Volunteers (of record) who assisted with the 1993-1994 field recovery of data on Cactus Hill are listed below. Volunteers who are not listed may not have the signed the site register:

Annette S. Barr, Petersburg, VA

Charles Barr, Petersburg, VA

James Barr, Petersburg, VA

William E. Barr, Petersburg, VA

Mike Bartlett, Brookeville, MD

J. Howard Boney, Emporia, VA

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Dick Helm, Richmond, VA

Tom Hobbs, Mechanicsville, VA

Dennis R. Hudgins, Richmond, VA

W Jack Hranicky, Alexandria, VA

Michael F. Johnson, Falls Church, VA

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John Mark Joseph, Richmond, VA

Robert A. Joyner, Carson VA

Frances Kaplan, Richmond, VA

Neal Kaplan, Richmond, VA

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Jim Livesay, Richmond, VA

N. Gordon Lohr, Richmond, VA

Tom Long, Chesterfield, VA

Lewis N. Madson, Jr. Newport News, VA

Dane Magoon, Richmond VA

C. N. Manson, Richmond, VA

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Lawrence Reynolds, Richmond, VA

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Jennifer Shepherd, Richmond, VA

David B. Shonjo, Annandale, VA

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Guy Smith, Hopewell, VA

William A. Thompson, Jr., Chesapeake, VA

John H. Tillman, Jr., Newport News, VA

Vicia Via, Falls Church, VA

Bryant Warren, Jr., Disputanta, VA

Herbert B. Warren, Disputanta, VA

Craig Weinstein, Richmond, VA

Robert W. West, Chesapeake, VA

Buck W. Woodard, Richmond, VA

John Zaun, Virginia Beach, VA

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Chapter 1

Site Background

Introduction

Cactus Hill, 44SX202, a severely threatened, culturally stratified archaeological site on the Nottoway River in Sussex County, Virginia, was excavated as a volunteer salvage project beginning in October 1993. The site is located near the town of Stony Creek and approximately 45 miles south of Richmond in the southeastern part of Virginia (Figure 1.1). Three areas of the site, differentiated as A, B, and D because of differences in soil type and depth of cultural deposits, were excavated. Members of several organizations participated including the Nottoway River Survey (NRS) and the Archeological Society of Virginia (ASV). Areas B and D of the site were excavated under the direction of J. M. McAvoy, while area A was excavated by M. F. Johnson. McAvoy's major excavations, accomplished with help from local ASV Chapters as part of the survey of Nottoway River sites, were conducted from October 1993 intermittently through 1994. Johnson's work, as a project of the Northern Virginia Chapter of the ASV, was conducted in October 1993 and April 1995.

The primary purpose of the Cactus Hill project, as undertaken by the NRS, was to locate, investigate, and salvage datable, *in situ* features of Paleoindian and Early Archaic age. The emphasis here was placed on the earliest use of the site, but some later Archaic, Woodland, and historic material also was recovered. Middle Archaic and Late Archaic features had been investigated and dated previously on the Slade Site, 44SX7, (Egloff and McAvoy 1990; McAvoy 1988) three miles upriver. The October 1993 excavations were conducted over a three week period with more than 60 volunteer workers, and with very little funding. This approach was necessary due to the ongoing, and escalating, destruction of the site, the very high potential of this

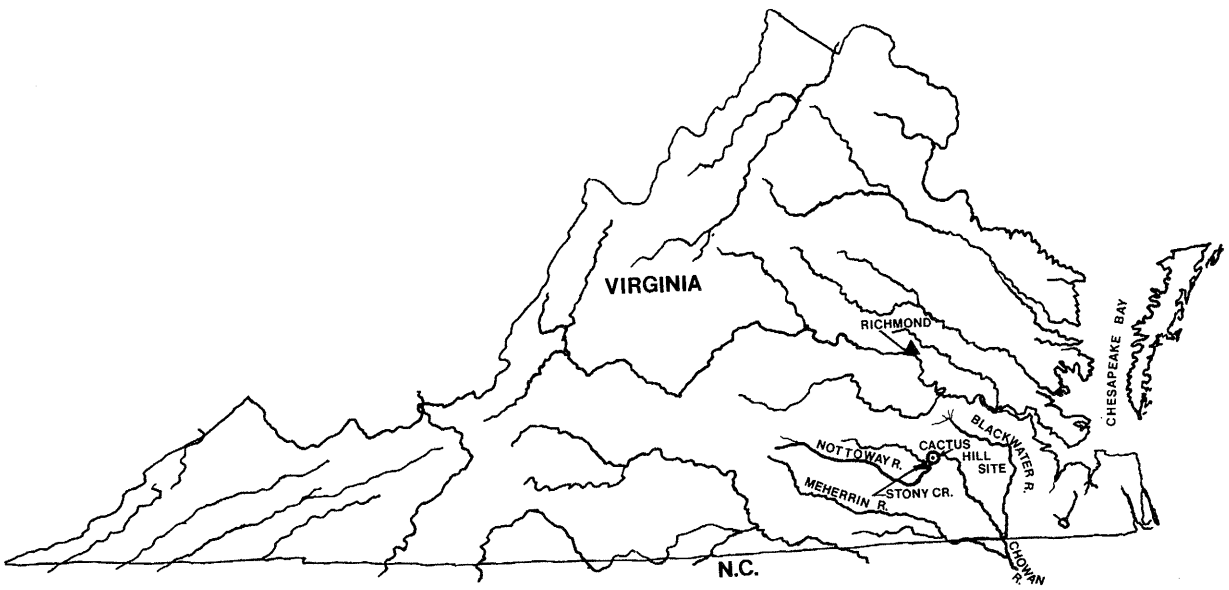


Figure 1.1: Cactus Hill Site Location.

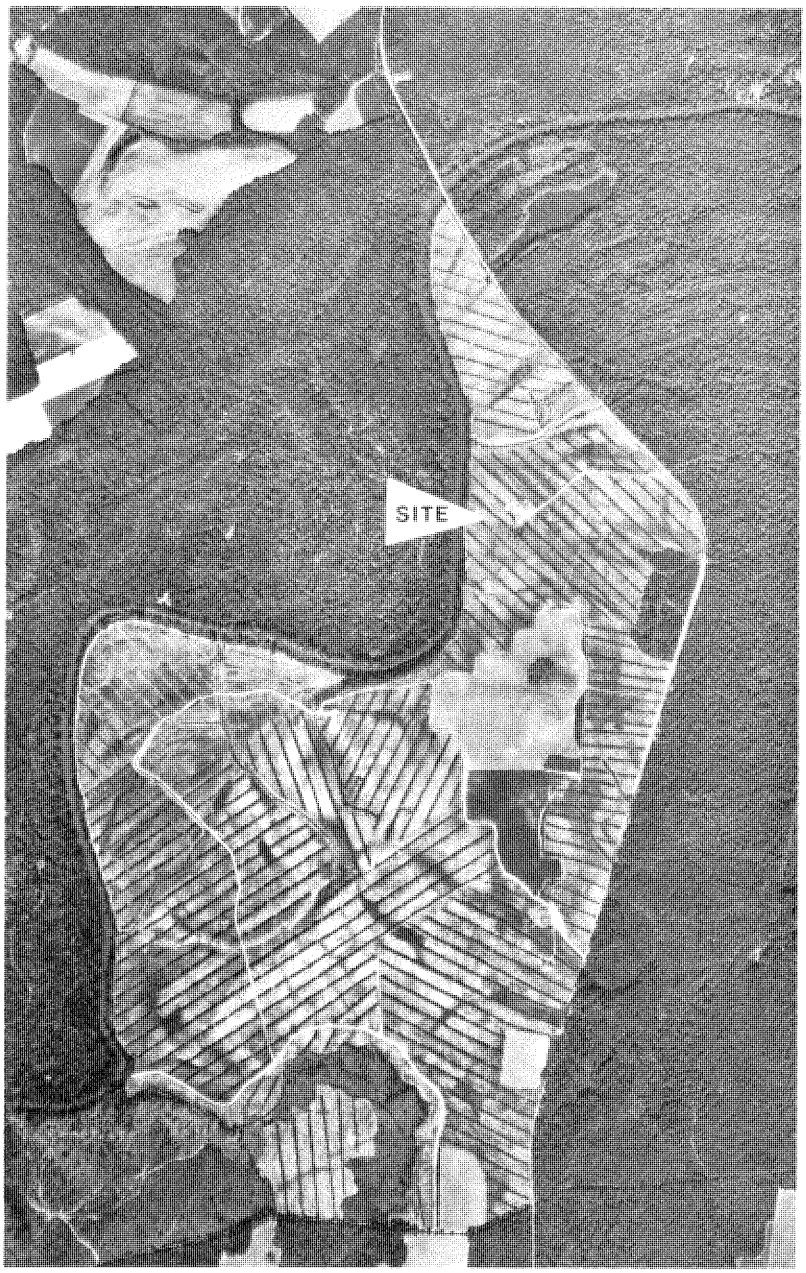


Figure 1.2 Cactus Hill Site area in the apex of the north bend of the Nottoway River Sussex County, Virginia. River flow is north in the site area. Route 637, Railroad Bed Road is to the right of the site, and Route 640, Cabin Stick Road is to the south (bottom). Photograph courtesy Virginia Department of Transportation.

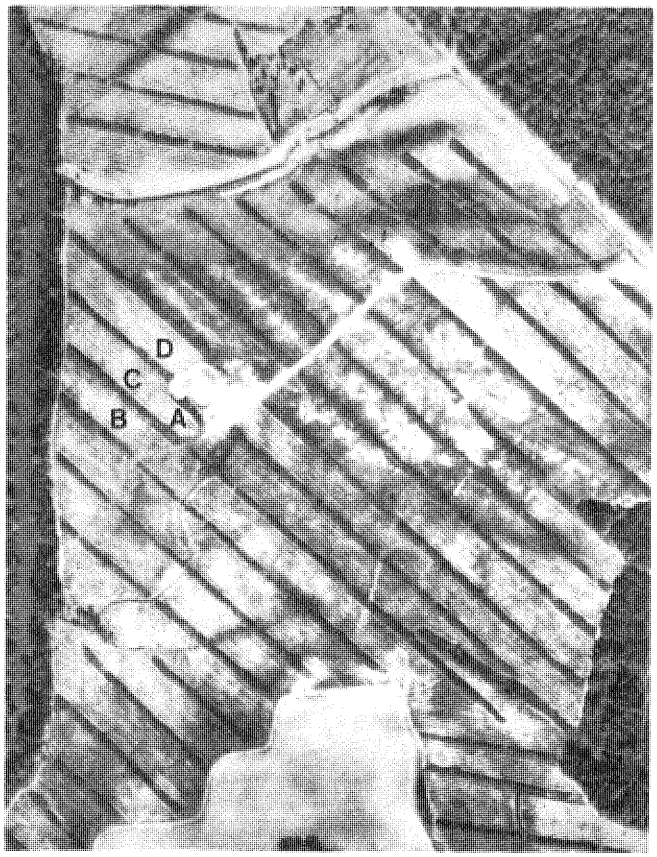


Figure 1.3: Cactus Hill Site, from Figure 1.2, enlarged 3X to show extent of the sand pit in 1978, and location of excavation areas A, B, C, and D. In this photograph tree rows are located between debris rows slanted northwest to southeast. Distance between debris rows is approximately 120 feet.

site for producing early features, and the lack of any legally required state or Federal review of the site (private sand mining) for CRM funding. Partial funding for data recovery was provided through the Virginia Department of Historic Resources' (DHR) Threatened Sites Program for some of the ASV's field expenses. Also, much of the subsequent data analysis work for the material recovered by the NRS was funded by DHR through this program.

Site Discovery and Sequence of Archaeological Investigations

Mr. H. A. MacCord, Sr. of Richmond, Virginia filed a site inventory form with the Virginia Research Center for Archaeology (now the Department of Historic Resources) on December 11, 1985 which reported the Cactus Hill Site. MacCord's report indicated that the site probably contained a Paleoindian component, and produced cultural material to a depth of approximately 3 feet. He had been informed of the existence of the site by Col. Richard Ware of Petersburg, Virginia who had collected there in the early 1980s, and MacCord noted that many other collectors had material from the site. MacCord's report gave the site location as "... on a former sand dune, about 800 feet east of the right bank of the Nottoway River. The site is a sand pit on top of a dune, with recently reforested areas to east and west. A logging road leads to the site from Va. Rte. 637, about 0.8 miles south of the bridge over the Nottoway." The site was noted also as being on property of the Union Camp Corporation.

A recent review of Virginia Department of Transportation aerial photographs of the site area has revealed that as of 1963 there was no sand mining, but by 1978 Union Camp had opened a small sand pit about 600 feet east of the river (Figures 1.2 and 1.3). The sand pit would be extended to the east and west over the next 16 years.

The site was first brought to the attention of NRS members in 1988 by a local resident. Mr. Harold Conover of Carson, Virginia had traced sand and artifacts deposited as road fill on property adjacent to his Dinwiddie County farm to a sand mine on Union

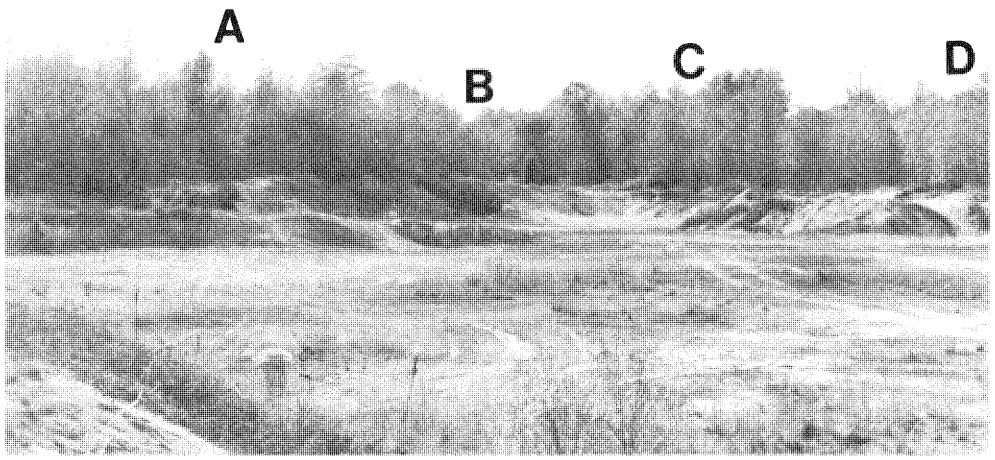


Figure 1.4: The Cactus Hill Site in October 1994. Excavation areas A, B, C, and D are marked. Photograph taken looking west to the Nottoway River beyond the tree line at area C.

Camp's Riverland Tract, Block 340, in Sussex County along the Nottoway. The mine was described by Conover as being located near a hardwood tree farm on a large sand hill directly east of the river, and it was stated that artifacts were washing out of the walls of exposed sand cuts at least two feet below the surface. It was later determined that this was the same site reported by MacCord in 1985. At the time of Mr. Conover's report, NRS members were completing work on the Slade Site, 44SX7, just three miles up river, and investigated the Union Camp site. Working with Hickory Hunt Club personnel who leased the site, and local Union Camp employees, survey members placed a 100 square foot excavation into the west wall of the sand pit. Artifact collectors were already digging into the walls, and this excavation was placed adjacent to such an area. The results of this small excavation were very promising as much of the sequence of projectile points of the Early Archaic period, as then known in eastern Virginia, was recovered. In addition, at the basal level of the stratified cultural sequence at a depth of 35 inches (90 cm) a few flakes of Williamson chert and jasper were recovered which indicated a possible Paleoindian component.

Other similar small test and salvage excavations were placed around the sand pit and on the western slope to the river between 1989 and summer 1993. While Early and Middle Archaic culture sequences were reproduced several times along with identifiable faunal remains and datable carbon from features, no diagnostic Paleoindian artifacts (projectile points) were recovered by the survey members. During this period local collectors continued to dig for artifacts in the sand pit walls and on the southern and western slope of the site. Survey members were shown three Clovis-like fluted projectile points which had been dug from collecting pits near the edge of the sand mine on the western slope of the site. A Paleoindian component, therefore, was known to exist on the Cactus Hill Site before 1993.

Also in this time period the NRS was completing a detailed survey of all Paleoindian sites in the area on the river and its tributaries. This survey revealed that local, culturally stratified sites producing two or even three Clovis points were not uncommon, and Cactus Hill was named as one of these sites (McAvoy 1992). This work led to an inquiry about the Cactus Hill Site in 1993 from Michael F. Johnson, archaeologist with Fairfax County, Virginia, who was conducting the Virginia fluted point survey. The Barr family of Petersburg, Virginia, at the suggestion of a friend David Collins of Carson, Virginia had just reported to Mike that they had two fluted points which were collected from the edge of the sand pit. Their discoveries, made in 1987, brought the number of known Clovis-like points from this site to a very impressive total of five. With this number of diagnostic Paleoindian artifacts from one general area of the site, it was concluded by McAvoy and Johnson that Cactus Hill should be given more attention.

An excavation was planned for October 1993 since the site was now being destroyed very rapidly. A major excavation with volunteer support would be needed to salvage any significant percentage of the remaining features. Johnson investigated the general area of the Barr family discoveries, which had been sampled previously (1990) by McAvoy and designated excavation area A of the site. McAvoy continued to investigate the area of the finds made by the artifact collectors on the western slope designated area B, and also investigated a more deeply stratified (but lower elevation) area of the site to the north, area D. The lowest elevation of the site, which had been sampled in 1991, area C, was not reopened. Overall, Johnson had opened approximately 1,200 square feet, and McAvoy had opened approximately 3,500 square feet of the site as of this writing in October 1995. The site area is shown in Figure 1.4.

A few additional comments are appropriate concerning the local residents and collectors who had been digging on the site as early as 1978. Most of these individuals were on the site without the knowledge or permission of the property owner or the hunt club, but several collectors and avocational archaeologists did have permits and were there legally. (This was a practice which was halted by Union Camp once the significance of the site was known, and Union Camp also stopped sand mining and timber removal operations in the area of the archaeological deposits.) However, one avocational archaeologist with a special permit to dig cooperated with the NRS, and he kept records of the horizontal and vertical locations of his finds. The only date for the Clovis period from this site (and from Virginia) was a direct result of Tim Shelor's interest in the site and his cooperation. Tim, privately excavating on the west slope of the site in area B, found a unifacial

discovery. Survey members immediately opened an adjacent 80 square foot area and recovered other Clovis artifacts and a Clovis hearth with datable carbonized wood. This was in 1994 after most of the formal archaeological work had been completed without the discovery of a datable feature at the Clovis level. This general area of the site now has been destroyed by looters, and without the help of a conscientious individual this feature would have been lost.

Addendum

After the completion of this manuscript in early 1996, additional field work was undertaken by NRS in an area of the site designated A-B. This work was to confirm the results of the 1993 and 1994 seasons, which seemed to indicate the presence of pre-Clovis cultural materials on Cactus Hill. The results of the 1996 work are presented in the addendum, along with new radiocarbon dates for the pre-Clovis levels and additional artifact descriptions.

Chapter 2

Site Area, Geology, and Environmental Setting

Site Area

The Cactus Hill Site lies on the western portion of Virginia's Coastal Plain physiographic province, approximately 13 miles (20.9 kilometers) east of the Fall Zone of the Piedmont Province. The town of Stony Creek is located approximately 4.5 miles (7 km) to the southwest. The site is shown on the U. S. Geological (USGS) 7.5 minute Sussex topographic quadrangle dated 1967 (Figure 2.1). The maximum site elevation is estimated to be 73 feet (22 meters) above mean sea level (AMSL). The sand hills forming the site are located on the east bank of the Nottoway River near the apex of the large "north bend". This location is about midcourse (channel mile 82 from source) on the river. The Nottoway rises in the Piedmont Province in Lunenburg County, Virginia and flows for 155 miles to the east where it meets the Blackwater River to form the Chowan River on the Virginia-North Carolina line. The Chowan River empties into the Albemarle Sound in eastern North Carolina. Near the Cactus Hill site, the river has a drainage basin of approximately 987 square miles. Cactus Hill is situated about 1,500 feet north into a 5,000 foot (1,524 meter) straight course of the Nottoway between right angle, eastward bends.

During normal high water, the river shoal is at elevation 45 feet (14 meters) AMSL on the straight course. Across the river to the northwest Beaver Pond Swamp and a channel of Gosee Swamp enter the Nottoway, also at elevation 45 feet. Approximately 9,000 feet (2,743 meters) to the southwest, large Rowanty Creek enters the river on the north bank at elevation 50 feet. The site also is bounded to the south by Cabin Stick Swamp and to the east by Black Branch Swamp. These swamps are at elevation 50 to 60 feet. The general area within one mile of the site is, therefore, low and swampy. A feature of the site of particular interest is a low ground directly to the south. From photographs and maps it appears that this area was almost circular in shape and 800 feet across in 1967 before being channeled and drained for tree farming. This area, at an elevation of approximately 66 feet, seems to be a high seepage drain basin for the southern and western portions of the site.

Major areas of interest of this site (excavation areas A, B, C, and D) as surveyed in 1995, were encompassed within an area of six acres (2.428 hectares). This included the excavation areas, western slope to the river, and edge of the southern drainage basin. Areas of lower artifact density extending beyond approximately 600 feet (183 meters) east of the river were not considered. However, shovel tests and the Union Camp road cut show a low density scatter of cultural material out to Rte. 637, 1,600 feet (490 meters) to the east.

Site Geology

Johnson and Jones have provided a preliminary analysis of the geology of the Cactus Hill Site, which appears as Appendix C to this report. They note that the site is located over the Nottoway above the first terrace, which exhibits a ridge and swale topography in linear east-west orientation. A topographic relief of 6 feet is estimated. To the north and south of the terrace containing the site is Lee Hall Scarp, and above this scarp is a succession of terraces with tread elevations as high as 90 feet.

Johnson and Jones further note that in the site area, the base of the alluvium making up the bed of the Nottoway River rests upon coarse sediments of the Cretaceous Potomac Group. The channel walls, however, are cut into middle and early Pleistocene formations. The site proper is situated upon a low, east-west trending scarp separating an upland underlain by clay and lower area characterized by fluvial deposits. (The age of this interface is not known, but it must date to at least the middle/late Pleistocene based upon the age of the channel walls as reported by Johnson and Jones.) The fluvial unit

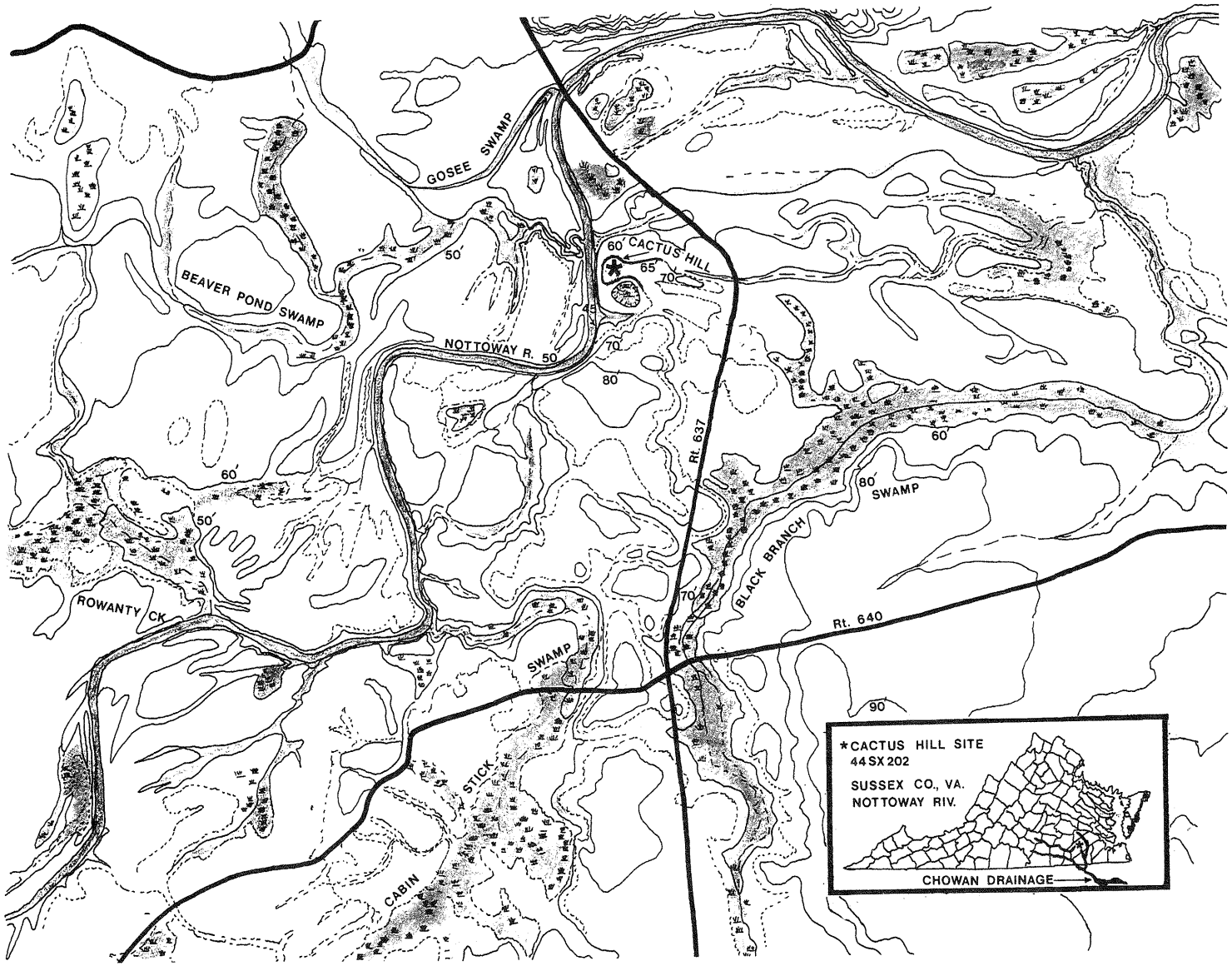


Figure 2.1. Cactus Hill Site area shown on the (modified) USGS 7 minute Sussex topographic quadrangle, 1967.

above the clay was tested for thickness in 1994 near the southern end of the sand pit using ground penetrating radar. This suggested that the fluvial deposits were at least 12 feet thick and cross bedded (Johnson, pers. comm., 1994). Above the fluvial unit was surficial sand which contains the stratified cultural material. Johnson and Jones noted that the surficial sand mantled only part of the site, and while it was a thin cover of perhaps 20 inches depth on the northern part of the site (above area D) it thickened to between 4.5 and 6 feet to the east and south (areas A and B). The sand lies directly on the clay unit to the extreme south where it is approximately 6 feet in depth and forms the ridge containing the major concentration of cultural material. Grain size of the surficial sand decreases from medium sand on the northern slope (area D), to a medium to fine sand on the southern slope. Sorting of the sand was at best moderate and only on the western part of the crest of the hill. Sand grains were found to be generally subrounded to subangular in the north-south transects.

Johnson and Jones conclude that the sand is "aeolian", with the source area being the fluvial sand and gravel unit about 300 feet (90 meters) to the northwest. The fining of the medium sand to the south and east support the eolian mode of deposition and source area to the northwest. It also was noted that the main part of Cactus Hill was a well drained sandy area, but that the area to the south, underlain by clayey soils was less well drained. The area of poor drainage was a linear trough which functioned as a collection area for water. A possibly higher channel elevation of the Nottoway in the late Pleistocene, at the time of earliest inhabitation of the site, would have made the swale areas and low drainage area to the south even wetter than they are today.

In general, it was concluded that before deposition of the eolian sands to form the highest areas on Cactus Hill, there was an east-west trending scarp underlain by clay. This scarp was near the present southwestern edge (area B) of the site, and there was a lower elevation deposit of fluvial sand and gravel located to the northwest of the scarp. Well before 15,000 years B. P. eolian activity started which deflated the fluvial deposit and redeposited medium and finer sands across the clay scarp to the southwest. This redeposition could be considered either a sand sheet or possibly a parabolic dune given the asymmetrical north-south topographic cross-section of the main sand hill. In the deepest culturally stratified location (area D) of the site, accretion rates were calculated by the authors based on archaeological evidence and appear as Table 2.1. It appears, based upon these data, that accretion rates in area D of the site are most accurately described as follows: 6,500 to 7,000 B. P. - 1.5 cm/100 years: 7,800 to 8,700 B. P. - 0.4 cm/100 years; and 8,900 to 9,400 B. P. - 3.8 cm/100 years. There are significant gaps resulting from lack of data, and the rate between 6,500 B. P. and present is difficult to estimate without an accurate knowledge of the location of the modern surface. The exact position (elevation) of the modern surface cannot be established for this site, since tree farming and earlier agricultural activity have reworked the surface. The values given here are based on the results of all of the excavations and radiocarbon dates from area D.

One significant addition/modification to the site development model given by Johnson and Jones in Appendix C is offered by the authors. This addition concerns the development of fluvial deposits to the north of the site which were deflated to form the eolian sand sheet or dune. In the later stages of site area development, some of the fluvial deposits to the north, down river, of the east-west orientated clay ridge may have been the result of a flood stage eddy, or back water, resulting from the projection of the clay ridge into the river flow. Because of the elevation of the clay ridge this projection probably would have been a factor only during high water at flood stage of the river, and would have been of greatest influence when the river channel was higher than at present. This might account for a continuous deposition of sand in the late Pleistocene and throughout the Holocene which was continuously deflated as it was deposited. This model does not require selective area loss of vegetation on the site, exposing only certain areas to wind erosion, while other areas seem to have continuously experienced sand accretion.

Observations which support this model are: (1) higher eolian sand accretions rates in area D in the early Holocene at 8,900 to 9,400 B.P.; (2) the lack of significant fluvial deposits and the clay bottomland on the south side of the ridge in the low lying "scoured"(?) up-river location; and (3) the continuous accretion of sand on Cactus Hill with no indication of periods of sand erosion on the most

Table 2.1. SAND ACCRETION RATES, CACTUS HILL SITE AREA D

Time Span (Years B. P.)	Interval (Years)	Average Accretion Rate in Inches per 100 Years	Average Accretion Rates in cm per 100 Years	Number of Areas Used in Average
6,500-7,000	500	0.58	1.5	2
7,800-8,700	900	0.17	0.43	3
8,300-8,700	400	0.25	0.64	1
8,300-8,900	600	0.7	1.8	1
8,300-9,100	800	1.13	2.9	1
8,900-9,100	200	1.8	4.6	4
9,100-9,400	300	1.0	2.5	1

vulnerable hill top locations. It also is noted that projections in stream flows were postulated by Coe (1964) as the model for site development at the Gaston and Doerschuk sites in the Piedmont of North Carolina. While Coe's model concerned only fluvial development of stratified sites on a Piedmont flood plain, the Cactus Hill situation seems to show an eolian deposition mode in association with a much more modest, and possibly simultaneous, fluvial deposition. This model is shown in Figure 2.2.

Elevated sand formations containing archaeological sites are fairly common in this area of the Nottoway River drainage and in general across southeastern Virginia. While there are probably many related factors accounting for development of these sites, ranging from true eolian dune formations to fluvial deposits without an eolian component, the sites were all higher and better drained than the surrounding topography. Where sand sites were associated with other resources, such as a good spring and quarry materials, the locations were heavily used.

Environmental Setting and Resource Base

There were a number of environmental and resource related factors influencing use of the Cactus Hill Site and this general area. The climate in southeastern Virginia is temperate and greatly affected by the Atlantic Ocean approximately 100 miles (160 kilometers) to the east of the site. In the late Pleistocene, the ocean was probably 180 miles (290 kilometers) east of this area. The average annual temperature now is approximately 60^{0}F with

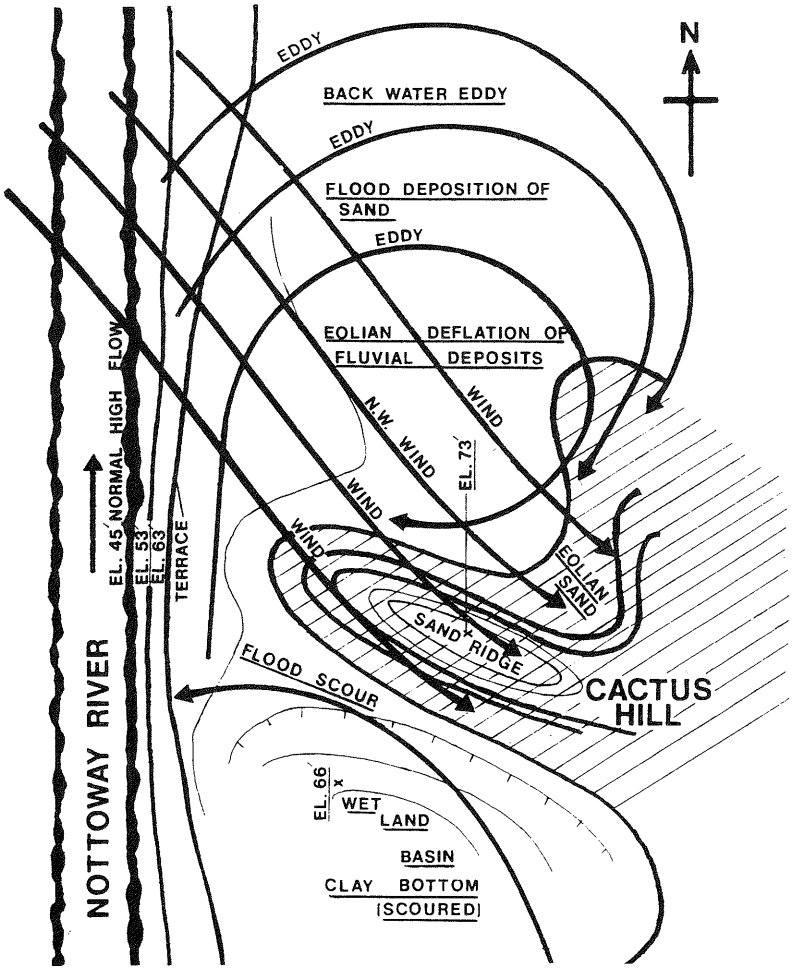


Figure 2.2. Geological development model for the sand ridges on the Cactus Hill Site.

extremes of 110^0F to -15^0F. An examination of local climate change throughout the late Pleistocene and Holocene is beyond the scope of this report. The reader is referred to an excellent current review of this subject by Dent (1995) in his publication on Chesapeake prehistory.

The forest in this location can be characterized as the northern part of the southeastern evergreen forest region bordering the deciduous oak-hickory forest (McWeeney, Appendix D (1)). While the present day vegetation on Cactus Hill has been modified to a sweet gum forest by tree farming, some clear areas of the hill top are being reforested naturally. The reforested area of the site surveyed by NRS in summer 1995 consisted of hickories, red oak, chestnut oak, willow oak, white oak, swamp white oak, scarlet oak, water oak, winged elm, persimmon, American holly, smooth sumac, American hop hornbeam, dwarf sumac, eastern red cedar, black gum, sassafras, dogwood, and long and short needle pines. Adjacent to the sand hills are beach, tulip poplar, red maple, and sweet gum. There is a diversity of bushes, shrubs, vines, and small plant ground covers, but the most unique and plentiful are the prickly pear cactus (Indian fig) plants which give the site its name and which in some years cover the site with yellow blossoms. The adjacent shaded damp areas and wetlands produce a diversity of plants including ferns. A review of late Pleistocene and early Holocene forest components in southeastern Virginia is presented by McWeeney (Appendix D).

The extensive nature of the swamps and wetlands surrounding Cactus Hill would account not only for numerous edible plants, seeds, and fruits, but also a diverse community of game animals including fish, reptiles, amphibians, and fowl. This is well documented by Whyte (Appendix E) in the assemblage of calcined bone fragments from cooking hearths on the site. All of the faunal remains from the archaeological record, back at least 9500 years, represent animals common in this area today.

For tools, wood, bone, and stone were available in the immediate site area. The river shoals, channel walls, and bed of the Nottoway are littered with good quality quartzite and quartz cobbles, which were heavily utilized for tool production. Johnson and Jones (Appendix C) note the source of these rocks as the Nottoway drainage system with the initial source location for some quartzites being the west flank of the Blue Ridge and adjacent Valley and Ridge. Also, the earthen mantle of the Piedmont contains abundant quartz clasts. Other igneous and metamorphic rocks, such as granites and slate-like materials were available in the Piedmont. The unique Fall Line cherts of the eastern Piedmont (McAvoy 1992), available from quarries located approximately 15 to 25 miles from the site, are also well represented in the cultural deposits on Cactus Hill.

Geographically, Cactus Hill is one of the most northeasterly site locations on the Nottoway River, and it is situated adjacent to the historic Tuscarora Trail. This location, near a major trade/travel route, could have presented a favorable situation in the early historic period in terms of access. The site was patented by Robert Hawthorne in 1701 based on an application of 1695, at the first opportunity available for the English to make legal claim on what had been the Indian lands south of the Blackwater River.

Chapter 3

Research Objectives

The Nottoway River Survey

The excavation of the Cactus Hill Site was the forth major excavation undertaken by the members of the NRS along the river in Sussex County, Virginia. Previous major excavations were the Fannin Site, the Slade Site complex, and the Stith Site. Survey members also had conducted small test excavations on 10 other sites along the Nottoway River and its tributaries in Dinwiddie, Sussex, and Southampton Counties. Over 100 sites had been surveyed using surface investigation techniques ranging from general to controlled surveys on 10 meter grids. All of this work was in conjunction with the survey of threatened sites in the Nottoway River drainage.

This area of the Nottoway was of particular interest because of the quantity of Paleoindian and Early Archaic material found on many of the river bottomland sites. The area selected for the survey was approximately 20 miles east-to-west by 15 miles north-to-south. The survey was generally centered around the town of Stony Creek and extended along a 40 mile course of the Nottoway in the large "north bend" of the river. While some survey work was conducted in the uplands, most was associated with the sandy, stratified river bottomland sites.

The research objectives, as stated for the survey by McAvoy (1992), are as follows:

1. To locate and record Native American sites on cultivated land over a forty mile course of the Nottoway River, and in the adjacent uplands, in the "north bend" region of Sussex County, and Dinwiddie County, Virginia.
2. To identify the diagnostic artifact types present on each of the sites through surface collections.
3. To establish a radiocarbon dated culture sequence for the Paleoindian through Archaic periods by selective excavation of threatened sites.
4. To establish the settlement pattern of Paleoindian and Early Archaic cultures.
5. To identify general site types in the survey region based on site usage (i.e. quarries, base camps, small hunting, fishing, and food procurement sites, etc.)
6. To trace the movement of distinctive lithics from quarries to sites within the survey area, based upon the cultures using these lithics.

Many of the research objectives had been accomplished prior to the major excavation undertaken on Cactus Hill (McAvoy 1992; Egloff and McAvoy 1990; McAvoy 1988). However, the survey had produced no radiocarbon dates for the Early Archaic period although traditions of the Middle and Late Archaic periods had been identified and dated (Egloff and McAvoy 1990). Major questions remained unanswered concerning the time of the first use of this area and the exact sequence and age of Paleoindian and Early Archaic traditions. The study of Early Archaic settlement patterns and general settlement strategy had not been completed; although, detailed survey and site results had been published in relation to the settlement patterns of the Paleoindian Clovis culture (McCary 1983; Turner 1983; McAvoy 1992). With many research objectives remaining, excavation of the Cactus Hill Site was reinitiated in 1993.

Cactus Hill Research Objectives

Very Early Site Use

For fifteen years survey members had investigated mining cuts in sand pits on archaeological sites along the river in search of any indication of deeply buried strata containing cultural materials. Some indication of deeply buried blade/flake tools had been found on a site on Harris Creek near the Fall Zone, but there was no acceptable reference point on this site for judging the age of the artifacts. They did appear to be below Early Archaic material but no diagnostic Paleoindian artifacts were

found *in situ*. Also, the geology of this site was not well understood. Were the deposits stable over the last 10,000 to 20,000 years? The Cactus Hill Site offered a number of opportunities for research not encountered on the other sites. Site geology was better understood at Cactus Hill, and this coupled with archaeological evidence clearly indicated that a stable sandy ridge representing an excellent location for an archaeological site had existed at area B prior to 11,000 B. P. Such a situation presented an ideal area to look for traces of very early site use. One of the preliminary test excavations put in area A of the Cactus Hill site in 1990 had produced a stratum of flakes and cores of good quality local materials quite deep and below Early Archaic Palmer material. No diagnostic Paleoindian artifacts had been found, but, the indication given by the depth of the deposit below Early Archaic artifacts dating ca. 7,000 to 8,000 B. C. was that the stratum was very old.

Based upon the work of Borster and Norton (1992) on the Johnson Site along the Cumberland River in Tennessee with very early Clovis material, and the work of J. M. Adovasio (Adovasio et al., 1977, 1978) at Meadowcroft Rockshelter in Pennsylvania, the presence of man in Virginia, at or before ca. 10,000 B. C., was considered a possibility. Also, there was a known fluted point component on the Cactus Hill Site, and if this component could be identified and isolated an early temporal reference point could be established. This would be important, since much of the early material (Meadowcroft) appeared difficult to assign to a specific time period out of excavated context. The early artifacts from Meadowcroft were not nearly as diagnostic as fluted points, or notched Archaic forms; thus, stratigraphy and absolute dating of carbonized materials in association with artifacts would be required.

In evaluating the archaeological record closer to Virginia, it is observed that the presence of a very old component on the Hardaway Site (Coe 1964) in Piedmont North Carolina cannot be precluded. Bifacial artifacts described as Hardaway Blades were recovered very deep in the stratified deposit, and it was speculated by Coe (1964), and Oliver (1983), that such materials dated to nearly 10,000 B. C. and 10,000 to 12,000 B. C. respectively. Clearly, these dates would exceed the oldest dates accepted in North Carolina or Virginia, if they could be confirmed by absolute dating. At present, there are no absolute dates from the Hardaway Site.

Besides identification and dating of very early site use, a study of lithic technology, lithic sources, floral and faunal associations and geological context would be of major benefit in understanding the settlement strategy of these people. For Virginia there was a blank page for the period before Clovis. Also, for areas of the United States outside Virginia, anything from an archaeological context possibly older than 10,000 B. C. has been viewed very skeptically.

Clovis and Other Fluted Point Traditions

The five fluted points which were known from Cactus Hill clearly indicated a significant research potential. All of the points had been found along a single ridge on the south side of the site over the clay-bottom wetland. It appeared that with an intensive effort, intact working and living surfaces used by these people might be found. There were no dates for the fluted point traditions in Virginia, and the closest site producing a date was Shawnee Minnisink in eastern Pennsylvania which dated approximately 8,600 B. C. (Haynes 1984). Credible dates for fluted point sites further to the northeast as reported by Haynes (1984) fell in the range of 8,240 ± 300 B. C. (Templeton, Connecticut) to 8,640 ± 50 B. C. (Debert, Nova Scotia).

Gardner's work (1977) provided a model for Paleoindian settlement in the Shenandoah Valley, in which lithic procurement and quarry activity were viewed as dominant factors. Gardner's model noted the existence of five types of interrelated sites designated as quarries, quarry reduction sites, quarry-related base camps, periodically revisited hunting sites, and non-quarry associated base camps. Clovis sites which were located along the Nottoway River with the type of artifact assemblage as then known from Cactus Hill were designated periodically revisited small hunting camps (McAvoy 1992). An extensive investigation of the Cactus Hill Site was considered necessary to accurately document the distribution of artifacts and activity areas across the site. This would allow a more accurate assessment of the nature of Paleoindian use of the site, and how the site should fit into the overall settlement pattern model postulated for this area (McAvoy 1992). An analysis of the five fluted points observed from Cactus Hill, revealed that three appeared to be made of local (within 25 miles) lithics, and possessed shallow basal concavities, and short flutes. These

points were very much like classic Clovis points from the Southwest. The two other points were made of lithics foreign to the Nottoway area and possessed deeper basal concavities, although length of fluting (remaining) was about the same as for the other three. These five points fit the general description of the two fluted point types which have been identified from this area (McAvoy 1992). The site held the potential for providing a larger data base suitable for assessing point typology, and the possibility of absolute dates for both point types. Also, additional projectile points and tools would help in establishing the distance of movement of lithics from quarries to the site.

Generally across Virginia there is a low archaeological visibility of Paleoindian occupation (Turner 1989). This is explained as a result of the foraging vs. collecting subsistence-settlement strategy (Binford 1980) postulated for Paleoindian hunters and gathers. Gardner's model would suggest that these people were dependent upon certain high quality lithic sources (quarries) which became central to their activities. Generally, Paleoindian activity was considered so brief at most sites that little evidence would remain of their presence. The Paleoindian research in the Nottoway River drainage indicated a fairly large number of diverse sites (McAvoy 1992) with a higher archaeological visibility (more frequent use?) than might be expected. Certainly, local quarries seemed important to the makers of Clovis-like fluted points, but the smaller, thin points with deeper concave bases (Middle Paleoindian?) often were observed to be made of lithics foreign to the area. Why was there a difference in the source of lithics between traditions? Were these people simply following a larger or different hunting circuit, or was the observation based on inadequate data? These were some of the research questions which might be answered at Cactus Hill.

The Archaic Periods and Later Site Use

The great majority of artifacts known from the Cactus Hill Site in 1993 were from the Early, Middle, and Late Archaic periods. These periods are generally accepted in Virginia to represent a time from 10,000 B. P. to approximately 3,200 B. P. In terms of material culture this is the time span from the first appearance of notched projectile points to the first appearance of pottery.

A relatively small Woodland component also had been observed on the site with most of this material representing the Middle Woodland period from ca. 500 B. C. to ca. 500 A. D. While little or no Late Woodland material had been reported, the site did seem to produce subsurface features, pits, and artifacts associated with early eighteenth century English settlement. Most of the historic period artifacts were observed near the crest of the hill, which largely had been destroyed by artifact collecting and mining by 1993. Artifact collectors had retrieved artifacts from some of the historic features, and many of these artifacts were discarded on the site as they were found.

The greatest research potential for the remaining areas of the site seemed to be for the Early, Middle and Late Archaic. Some work had been reported for these periods in southeastern Virginia (Egloff and McAvoy 1990). From the preliminary work accomplished at Cactus Hill by the NRS between 1989 and 1993, it was evident that hundreds of features and thousands of artifacts, representing these periods, had existed in areas A and B on the site. Also, several areas of lower artifact density with deeper stratigraphy existed in area D of the site. These area D locations were being destroyed only by sand mining, as artifact collecting was not a problem here. But, the primary focus of the sand mining activity had shifted to this area by 1993.

Early Archaic Period

Cactus Hill was considered an excellent addition to the inventory of Early Archaic sites previously excavated by the NRS. There was a high potential for radiocarbon dates for several of the heavier Early Archaic occupations on the site. No absolute dates had been obtained for the Palmer, Decatur, and Fort Nottoway traditions (Egloff and McAvoy 1990; McAvoy 1988) observed on the Slade Site. Occupation of the Cactus Hill Site by these traditions seemed to be of higher intensity than upon the Slade, Fannin, or Stith Sites which were excavated from 1983 through 1991. The Early Archaic settlement system models in Virginia are based on the model developed by Gardner for sites in the Shenandoah Valley (1980, 1989). Highly mobile groups with broad-based subsistence patterns characterize this period. Hunting and fishing supplemented by

gathering plant foods were activities carried out at a series of "camps" described as base camps, and maintenance and procurement camps. Quarry sites were also defined as important (special) resource localities, and were viewed as associated with some other type of camp.

It was known from the Slade, Fannin, Stith, and Cactus Hill Sites that some diagnostic artifacts representing the Early Archaic period on the Nottoway were not identified on the Shenandoah (Egloff and McAvoy 1990). Did this exclusion result from a spatial or territorial boundary in the same time period between groups, or were there simply temporal explanations for the differences? What were the absolute dates for these traditions in eastern Virginia? Were the traditions in eastern Virginia, which were not represented on the Shenandoah, represented in other areas in the eastern U. S.? And, if so, how did the dates compare between localities.

While quarry sites which produced high quality lithics were seen as critical in the Early Archaic period on the Shenandoah, this relationship was not as obvious on the Nottoway. What was the dependency on unique, high quality lithics at a site, such as Cactus Hill, 15 to 25 miles from the chert quarries? Was there really any need for a special trip to a chert quarry for tool kit replenishment when there were abundant, locally available, through somewhat inferior, quartzite river cobbles? Perhaps the local Early Archaic settlement pattern should be viewed in terms of the forest type which existed in the river valleys on the Coastal Plain in the early Holocene. Was there really a "patchier" resource environment at this time and in this area which would dictate that groups "cycle" through a number of resource areas before returning to a central quarry to replenish tools (Custer 1983)? This strategy might not have been needed in the quartzite rich river valleys on the Coastal Plain if the early Holocene forest was a continuous and productive oak-hickory-pine forest, and not a less productive hemlock dominated forest. The latter may have existed only in the Coastal Plain uplands away from the dry, sandy river bottomland soils not well suited to hemlock. Could this be verified by the presence or absence of hemlock in the carbonized wood samples from Early Archaic or Middle Archaic hearths on Cactus Hill?

Middle Archaic Period

The preliminary excavations at Cactus Hill had produced a sequence of Middle Archaic projectile points which was essentially the same as that reported for the North Carolina Piedmont (Coe 1964). The Cactus Hill artifacts also matched the type of Middle Archaic artifacts from other sites such as Slade (Egloff and McAvoy 1990) on the Nottoway. However, the quantity of artifacts from the bifurcate, Kirk Serrated, and Stanly traditions found on the Slade Site tended to be greater than that observed for Cactus Hill. Still, area D at Cactus Hill was thought to be an excellent area in which to recover stratified working surfaces from the Middle Archaic period. Questions which could be addressed by the excavation of Middle Archaic features concerned site use area and function, tool types, lithic selection and source for tools and projectile points, degree of curation of tools, identification of the local forest composition including any indication of the presence of hemlock in the river valley, and any indication of increased diversity in the use of fruits, seeds, and plants.

It was generally accepted that Middle Archaic groups tended to use locally available lithics, practiced minimal curation of tools, and probably operated within smaller territorial ranges. There were indications, however, on the Nottoway that the Middle Archaic Morrow Mountain I tradition sought out distinctive cherts from quarries in the Fall Zone on a frequency at least equal to that of the Palmer tradition of the Early Archaic period. One research objective of the Cactus Hill excavation was to evaluate the question of Middle Archaic use of non-local lithics and the implication of this activity in settlement size and strategy. Overall, was there evidence to support a general reduction in territory size in the Middle Archaic based on the source area of lithics for artifacts of this period? Would tool types associated with the Middle Archaic period on the Nottoway duplicate those reported for the Little Tennessee River sites (Chapman 1979)? The question of the first use of ground stone tools including celts, axes, bannerstones, mortars, and manos, also was unanswered for the Nottoway River drainage. Evidence had been found on the Slade Site of the use of a ground adz or celt-like tool with St. Albans bifurcates (Egloff and McAvoy 1990). Was evidence available at Cactus Hill to support this? LeCroy bifurcates were known from the Slade Site to

date 8,300 ± 110 B. P., and were associated with slab mortars, and pitted hammer/anvil stones (Egloff and McAvoy 1990). Could this evidence be duplicated at Cactus Hill?

Late Archaic Period

Late Archaic site use in the Nottoway River drainage was well known to NRS members through the identification of Savannah River style hafted bifaces, in numerous variants, from every site. The quartzite cobble quarries in the river bottomlands were especially heavily utilized in the Late Archaic period as they offered a source of large stones suitable for making long and wide bifaces. This observed heavy use of the river bottomlands was consistent with most models for Late Archaic settlement which indicated an increasing focus on the major river floodplains and decreasing mobility over time (Catlin et al., 1982; Mouer 1990). The focus on the major river floodplains was an indication to other researchers of reduced territories and increased sedentism.

The Late Archaic subsistance was based upon an increase in available riverine vegetation which was related to favorable modification of river level and flow as a result of climatic change in this period (Carbone 1976). River valleys thus became the sites of longer-term settlement. It was postulated that the decreased rate of sea level rise also increased the resource base within these aqueous habitats (Gardner 1980). Late Archaic sites were large in riverine settings, and this was coupled with many much smaller specialized sites in the uplands. Custer (1990) suggested that exchange networks might have been established as one means of providing for resources depleted by a combination of environmental variation and increased sedentism within the Late Archaic period. Were the vast quartzite quarries on the Nottoway in the Late Archaic a reflection of local manufacture of bifaces for exchange for other scarce resources, and were there artifacts on Cactus Hill which might reflect trade from a distant location? Would the Late Archaic pattern of intrasite use at Cactus Hill support the concept of increased sedentism, or would it point away from this concept? And, was the Late Archaic pattern of site use at Cactus Hill significantly different from the pattern of use noted for Early and Middle Archaic traditions?

Woodland Period

The Woodland period was known to be represented on Cactus Hill by early phase Middle Woodland cord marked pottery as well as minor amounts of other types of the grit tempered ware. Compared to the Archaic period use of the site, the observed Woodland component was minor, both in terms of artifacts recovered and area of use. Cactus Hill appeared typical of many sites in the immediate area surveyed which showed small localized concentrations of Stony Creek cord marked pottery over wetlands and swamps near the Nottoway River. Sites such as Cactus Hill could be described as small procurement encampments at which nuclear groups from base camps briefly resided. This site would fit into a logistical model of the type described by Binford (1980) in which base camps, established on a seasonal basis, were maintained by smaller groups which dispersed to small camps to collect resources. It is likely that a few seasonally available foods were the focus of the activity at the small camps such as Cactus Hill. From other small sites producing early phase Middle Woodland pottery, it had been observed that projectile points, and lithics in general, were rare.

The Cactus Hill excavation was expected to produce little information concerning this period as the upper levels of much of the site had been disturbed by plowing and tree farm activity. Where ceramic bearing strata were present, normally only one to three inch depths were preserved. Also, much of the site had been disturbed by artifact collectors, and many pot sherds were found on their discard piles. The discard piles proved to be an unexpected source of pottery for specific area collections on this site. It was felt that stratagraphically significant data probably could not be obtained from Cactus Hill for the Woodland period, but that ceramic types from the site could be described and perhaps the size of use areas estimated.

The Woodland period analysis was a separate part of the Cactus Hill project and was undertaken by J. P. McAvoy. The results are contained in Appendix B.

Historic Period

Historic period artifacts were known from three subsurface features on Cactus Hill at excavation area B. These artifacts were found on discard piles left by individuals digging for artifacts. One of the collecting pits was "squared up" to determine the feature profiles during the preliminary work done on the site. The artifacts were of late seventeenth century and early eighteenth century age, and corresponded to the time known for use of the site in association with Robert Hawthorne's patent of 1701. It was the objective of the Cactus Hill research project to investigate and describe the remnants of the historic period features as best possible, and to describe the artifacts. Since most historic period artifacts were recovered on discard piles near collecting pits, this presented serious limitations in data analysis.

As part of this analysis county records were investigated to determine the extent of the 1701 patent, and deed records, and wills were reviewed from this period. It was hoped that this would help clarify the significance of Cactus Hill, identify the occupants, and help in interpretation of activities carried out there between ca. 1700 and 1740. This also could be important in establishing any relationship between the site and the nearby crossing of the Tuscarora Trail, an important trade path in the late seventeenth century.

The historic period analysis was a separate part of the Cactus Hill project undertaken by J. P. McAvoy. The results are contained in Appendix B.

Chapter 4

Field and Laboratory Methods

Field Methods

Site Excavation Lay Out

The Cactus Hill investigation begun in October 1993 was to provide for data recovery in three areas of the site (Figure 4.1). Area A was defined on the southeastern edge of the site and about 450 feet east of the Nottoway River. This location was a remnant of the ridge above the clay-bottom wetland and occupied one of the most easterly areas of the site directly north of the wetland. Three small test excavations totaling 180 square feet had been placed near the edge of the sand pit in area A by McAvoy in 1990 and 1991. The primary work in this area was carried out by Johnson in 1993 (Figure 4.2) and 1995, and Johnson established his own datum for this work. All information concerning the excavations under the direction of Johnson in area A in 1993 and 1995, and a single excavation directed by Johnson in area B in 1995 have been prepared separately. These site reports appear in Appendix G.

Area B of Cactus Hill (Figure 4.3) was defined on the same ridge as area A, but 250 feet to the west, and much closer to the river. In this area the site sloped gradually downward to the west toward the river, while area A sloped away from the river to the east. The location to be excavated was laid out near the center of the ridge in 5 foot and 10 foot squares on a line 48 degrees west-of-north. A number of test and salvage excavations had been made here on the same general grid by NRS from 1989 to early 1993, and there was an extensive amount of disturbance from mining, artifact collecting, and tree farming. For this reason, very little of the grid could be excavated continuously in 1993, and the resulting excavation pattern appears quite disconnected. The datum for the site was established in area B as a metal rod driven into the ground. While the ground elevation at the datum was calculated to be approximately 73 feet above mean sea level (AMSL), this was only an estimate based upon a 28 foot rise to the hill cap from the river shoals, at the 45 foot contour line. The important variable in this method was our interpretation of the initial location of the 45 foot contour line by USGS. Johnson and Jones, Appendix C, interpreted the maximum elevation as only 67 feet. For site analysis purposes the datum elevation was set arbitrarily at 80 feet (24.4 meters). The grid system was extended continuously down-slope to the west for 120 feet, and three disconnected small test squares were spaced further down hill to the terrace edge just above the river.

Area D of Cactus Hill (Figure 4.4) was located 175 feet to the northeast of area B and at elevation 76 feet (relative to the area B datum elevation of 80 feet). The grid line for the area D excavation was established 15 degrees east-of-north in the center area of the ridge. A grid system was established based on 10 foot (3.05 meter) squares and extended for 60 feet north and 55 feet east. The final excavation unit to the east was ten feet by fifteen feet and was the only unit in area D of non-standard size.

Area C of the site had been tested in 1991 but was not laid out for excavation. This area was 121 feet to the north of the area B datum and at elevation 74 feet (relative to area B) near the edge of the sand pit. This location was a saddle area sloping to the north, and artifact density was low here. No other work has been undertaken in area C of the site.

To differentiate between the area D and area B excavation units two identification systems were employed. Area D is identified as units north by units east. A typical example would be N2E3. Area B is identified only numerically above the zero reference line with the first number representing the position to the north and the second the position to the west. A typical example would be 2/9, which

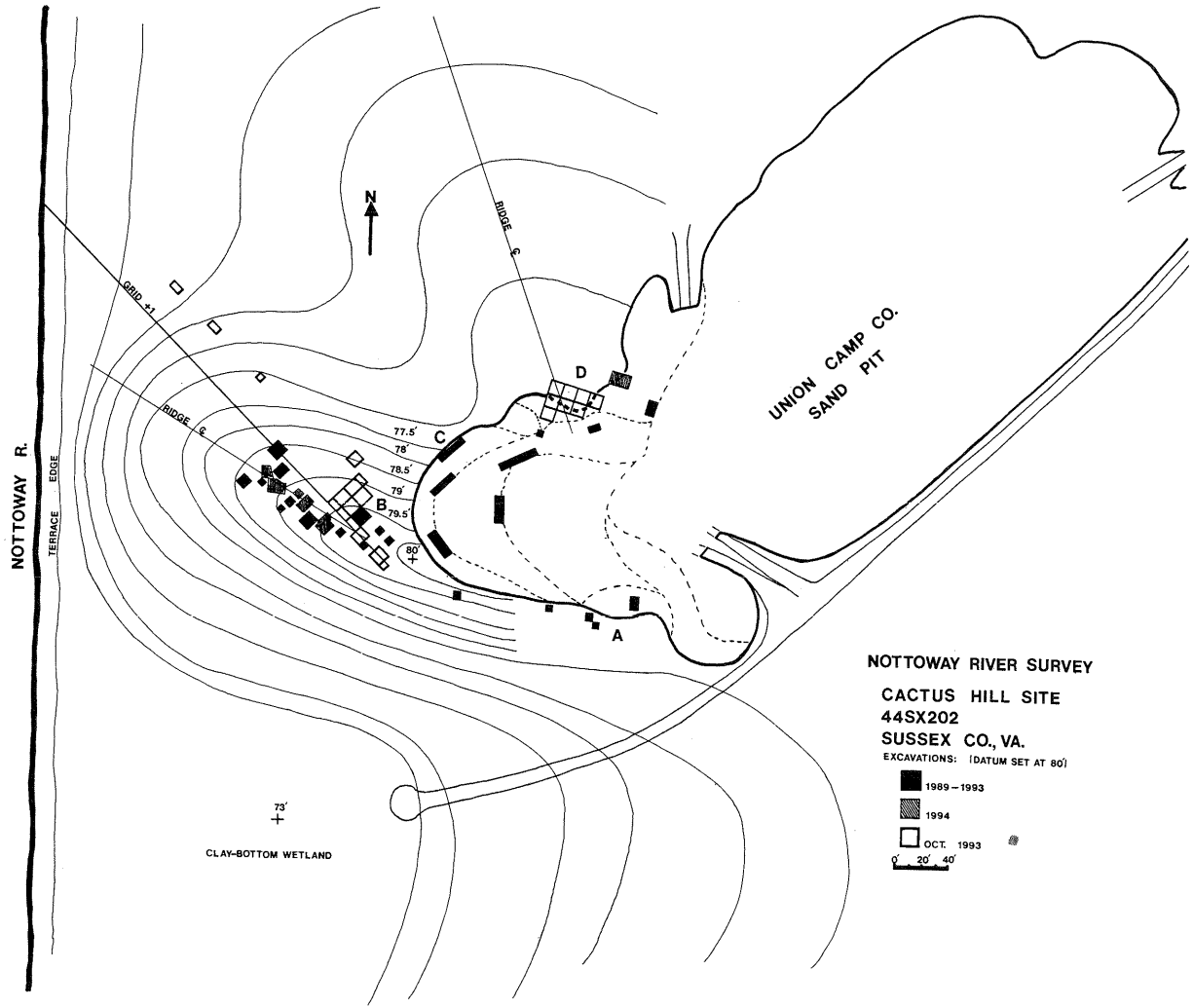


Figure 4.1. Site excavation plan and general site area for the Cactus Hill Site, 44SX202, Sussex County, Virginia; excavation areas A, B, C, and D, Nottoway River Survey work areas.

indicates 2 units north by 9 units west. Below the zero (northwest) reference line the unit is indicated by a negative sign and the symbol W, as in -1/9W.

The test and salvage excavations in areas A, B, C, and D at Cactus Hill, conducted between 1989 and early 1993, were designed to quickly sample and salvage artifacts from as many areas of the site as possible. These locations were usually in immediate danger of being destroyed by mining, or were adjacent to areas being destroyed by artifact collecting. The general approach to this test work was to grid off a unit of a size dictated by the geometry of the sand pit or adjacent collecting pits. Test units ranged from regular 5 foot squares to irregular 20 foot by 2 foot areas, and occasionally were merely "squared-up" pits abandoned by the collectors with a feature showing in a wall. Generally, the results of these small excavations are not included in this report, but are on file with the other excavation documentation retained by NRS.

Site Preparation and Excavation

The plowzones of the areas to be excavated in October 1993 at Cactus Hill were mechanically removed by use of a backhoe. Backhoe service was generously provided by Mr. Guy Smith, a private contractor from Hopewell, Virginia. This process removed the top eight inches of the ridge in area B to a light brown sand below the dark brown plowzone. Area A also was stripped as requested by Johnson. Area D, in the location to be excavated, was determined to be approximately 45 inches in depth from the top of the tree farm furrows to the bottom of the cultural deposit. The top 15 to 18 inches of this deposit were removed. This approach resulted in a loss of the tree farm disturbed zone, plow zone, and the brown sand directly below the plowzone. The removed area of the deposit contained few artifacts, but it represented 30% of the deposit depth. The excavation in this general area in 1994 was entirely by hand, with the upper level fully investigated. This documented and verified the low potential for data recovery in the upper region of the deposit which had been mechanically removed in 1993. Part of one feature and one diagnostic artifact were recovered in the entire upper 30% of the deposit in 1994.

Areas B and D, stripped by backhoe, subsequently were hand shoveled to remove loose and intermixed sand. These area were then excavated by flat shovel in arbitrary levels set by the lead excavator for the square. Normally, the arbitrary levels were one to six inches in thickness, with levels thicker than two or three inches divided into two inch sublevels. When features were encountered they were troweled and recorded. Some levels with large numbers of features, or high potential for significant data recovery, were excavated entirely by trowel.

Data Recovery

There was great variability in the quantity, stratigraphic integrity, and significance of the artifacts recovered from the Cactus Hill excavations. Few of the test or salvage excavations were large enough or complete enough to produce stratigraphically significant data. Several of the excavations did produce partial sequences of diagnostic artifacts of Early and Middle Archaic age, and these excavations are considered in this work. Generally, only the formal tools, or diagnostic artifacts, from such excavations are presented in this report. Analysis of debitage appears for the larger formal excavations on this site which were conducted in 1992, 1993, and 1994. Even for these excavations not every square excavated was considered a candidate for detailed debitage analysis. Only where there was clear and relevant stratigraphic integrity, as determined from observations in the field (not the lab) was a particular level of an excavation marked as a candidate for detailed debitage analysis. A more general debitage analysis was indicated for those levels not considered of adequate integrity for a detailed analysis. Observations made in the field were critical in determining which levels of the individual squares were of high integrity and not intermixed with downdrift, pit hearths, modern disturbances, tree roots, and animal burrows. With an average 10 foot square in area B of the site producing 15,000 to 40,000 pieces of debitage it was not practical to perform analyses and record data for intermixed and badly contaminated levels.

Laboratory Methods

All artifacts recovered by sifting with 0.25 inch hardware cloth (screen), or fine window screen were returned to the laboratory at the NRS facility in Sandston, Virginia for selective washing, identification, and analysis. Artifacts were identified in the analysis phase on the basis of a system of

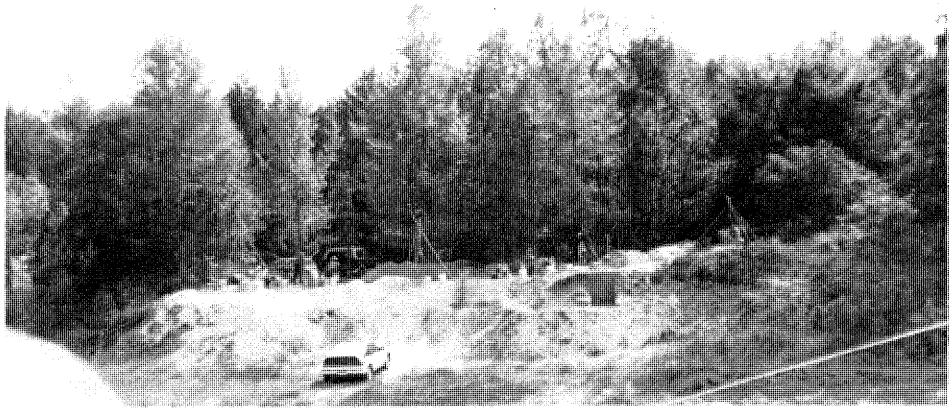


Figure 4.2. Area A of the Cactus Hill Site under excavation in October 1993. Beyond the tree line to the south the site drops off to a clay bottomed wetland.

Figure 4.3. Area B of the Cactus Hill Site looking to the southwest, across the ridge containing the oldest material excavated on the site. Beyond the tree line the site drops off to a clay bottomed wetland and then to the Nottoway River. Photographed in October 1994.

Figure 4.4. Area D of the Cactus Hill Site looking to the north. The site was under excavation in October 1994. The location of the October 1993 excavation was to the left of the elevated tarp, but had been destroyed by sand mining in winter 1993-1994.

defined artifact categories. These categories are as follows:

Prehistoric Pre-ceramic Period Artifact Categories

(For Ceramic period prehistoric artifact categories, and Historic period artifact categories see Appendix B).

Debitage:

Tested cobbles: River cobbles with one or two flakes removed;

Large primary flakes: produced by hammerstone or soft percussion from cores, generally described as larger than 40 mm size;

Secondary thinning flakes: normally produced by soft percussion from bifaces or tools, and from 8 mm up to approximately 40 mm size;

Small retouch flakes: from final retouch or resharpening of tools by soft percussion or pressure, and up to approximately 8 mm size (these were obtained in the field only with fine screening);

General shatter: flake fragments - unidentifiable, may be listed as thin shatter or "other" in flake analyses;

Blocky/angular fragments: heavy flake and core fragments, may be listed as large shatter;

Cobble cores: cores from river cobble fragments, or reduced cobbles collected from the river shoals;

Quarried cores: Cores from chert, jasper or metavolcanic stone quarries/collection locations in the Fall Zone or Piedmont - not collected as cobbles;

Blade cores: well formed polyhedral or block cores from which prismatic blades or core blades were derived;

Core blades: very symmetrical mulitfaceted flakes from blade cores;

Blade-like flakes: flakes similar to core blades, but not as symmetrical.

In-process tools:

Early stage bifaces: as defined by Callahan (1979);

Blocked, unfinished ground stone tools or decorative items: axes, celts, atlatl weights, gorgets, and steatite bowls;

Formal artifacts:

Utilized flakes: unmodified edge worn or edge damaged - unintentionally modified prior to use;

Edged flakes: intentionally modified prior to use;

Battered, pitted and abraded items: cobble hammers, abrading stones, and rough slab mortars;

Late stage bifaces: unmodified (unnotched) for hafting (these may include round, oval, elongated lanceolate, square, and pentagonal forms);

Heavy flaked but unground stone items: flaked axes, celts, adz blades, hoes, and picks;

Ground stone artifacts and tools: axes, celts, adz blades, atlatl weights, bolas weights, manos, shaped and deeply ground stone mortars, symmetrical pitted hammerstones, grooved and hafted stone hammers or mauls, gorgets, pendants, steatite bowl fragments, shaft grinders and straighteners, pestles, and steatite beads;

Diagnostic hafted bifaces used as temporal markers: projectile points and hafted knives which have been identified as temporal markers and are defined and typed in Appendix A, Projectile Point Description and Analysis, Cactus Hill Excavation Area B.

Other lithic artifacts:

Fire cracked rock: hearth stones and boiling stones cracked by thermal stress;

Unmodified cobbles in the archaeological context: often called "manuports" - these show no sign of modification but were used/intended for some use based on shape, weight or size.

Artifact Curation

All formal artifacts, worked stone, some hearth features, and some debitage have been retained in the Cactus Hill Study collection which is stored at the NRS facility in Sandston, Virginia. In those cases where a level or stratum of debitage was clearly associated with an identified and dated cultural period/temporal marker, the entire collection of debitage was retained with the formal artifacts and other worked stone, and carbonized or calcined organic materials. But, because of the extremely large number of artifacts recovered in this excavation not all could be catalogued and retained. Some of the debitage and FCR was discarded after it was counted and weighed, as was the practice reported in some previous work. This procedure was based upon a similar procedure used by Coe (1964) with the extremely large collection of artifacts from the Doerschuk Site. Claggett and Cable (1982) followed a similar procedure for FCR excavated upon the Haw River sites.

Chapter 5

Site Excavation and Data Recovery

Introduction

The research objectives and field and laboratory methods stated in Chapters 3 and 4 provided the basis for the archaeological excavation and data recovery in areas B and D at Cactus Hill. Information on area A was provided by M. F. Johnson and appears as Appendix G which is a separate report.

Approximately 500,000 culturally associated lithic artifacts and lithic fragments, as well as calcined bone fragments and carbon samples, were recovered from areas B and D on Cactus Hill. The extremely large numbers of artifacts are due in large measure to the quartzite cobble quarry activity on this site. Primary temporal markers, which are hafted bifaces, are represented by 543 specimens from the primary excavations in area B, and by 112 specimens from such excavations in area D. These 655 diagnostic artifacts represent the Middle Woodland, Late Archaic, Middle Archaic, Early Archaic, Late Paleoindian, and Middle and Early Paleoindian periods. The majority of these artifacts were produced in the Early and Middle Archaic. A major product of this work is the projectile point analysis, Appendix A, which is based primarily upon the Cactus Hill Area B diagnostic artifacts. This appendix represents our latest attempt at defining the Paleoindian and Archaic temporal markers for southeastern Virginia, and modifies to some extent the earlier work published by Egloff and McAvoy (1990).

The two major excavation areas (D and B) are presented differently in Chapter 5. The difference in presentation is a result of the difference in size, clarity, and completeness of the data base associated with each excavation. Most of area D was a large continuously excavated area. This area is addressed in terms of general culture sequence from the upper to the lower levels. Area B represents a disconnected series of smaller excavation units spread over a wider area. Area B also demonstrated less integrity in the culture sequence due to mixing from heavy use. Because area B did not produce the clear, continuous culture sequence noted across area D, each of the smaller excavation units in area B is individually addressed in terms of arbitrary excavation levels.

Soils and Stratigraphy

Soils across the Cactus Hill Site were examined by Johnson and Jones with the help of Robert Hodges, a soils scientist, and their preliminary results are contained in Appendix C. Several techniques were employed to collect such data at Cactus Hill, including mining cuts, vibracore samples, and hand auger samples. Cultural stratigraphy and shallow soils analyses also were performed by NRS for the location of the archaeological excavations in areas B and D of the site.

Figure 5.1 presents the typical soil profile and stratigraphy from the excavations at area B and area D of Cactus Hill. The excavation plans are shown as Figures 5.2 (area B) and 5.3 (area D). The variation in the maximum depth of cultural material in area B over a distance of 120 feet (36.6 meters) down slope, and over a width of 80 feet (24.4 meters) across the ridge also is presented in Figure 5.2. The Figure 5.1 typical values are those shown in Figure 5.2 for area B at approximately 40 to 60 feet down-slope (south - to-north) in the center squares. For area D, there was almost no variation in depth of cultural materials down-slope over the 60 feet (18.5 meters) excavated, as indicated in Table 5.1. The east-to-west slope is shown for the north wall units later in Figure 5.34.

Excavation Area B Soils and Stratigraphy

Area B soil zones and cultural stratigraphy are as shown in Figure 5.1 and Figure 5.2. The five soil zones are defined as:

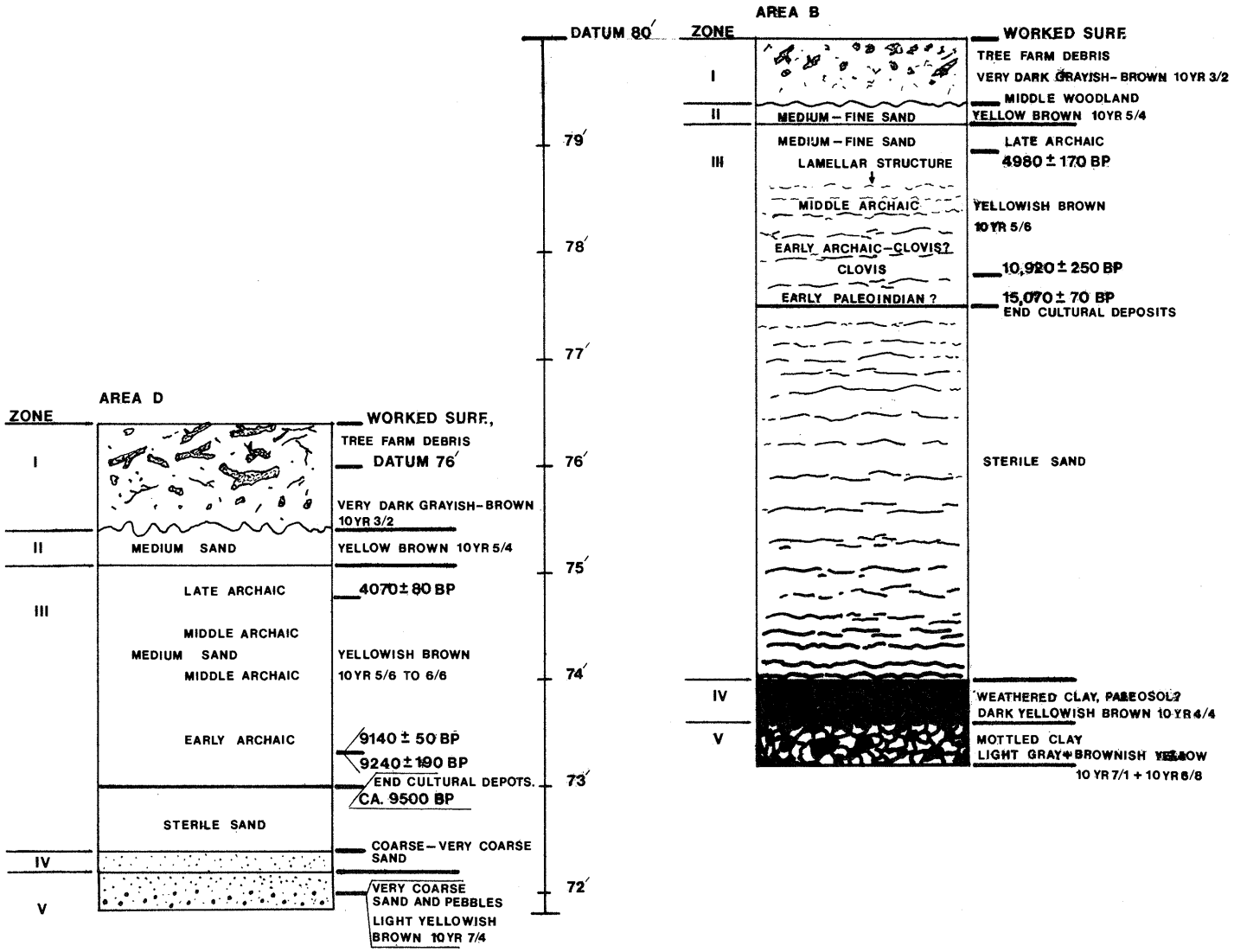


Figure 5.1. Cactus Hill Areas B and D, Soil Zones and Cultural Stratigraphy.

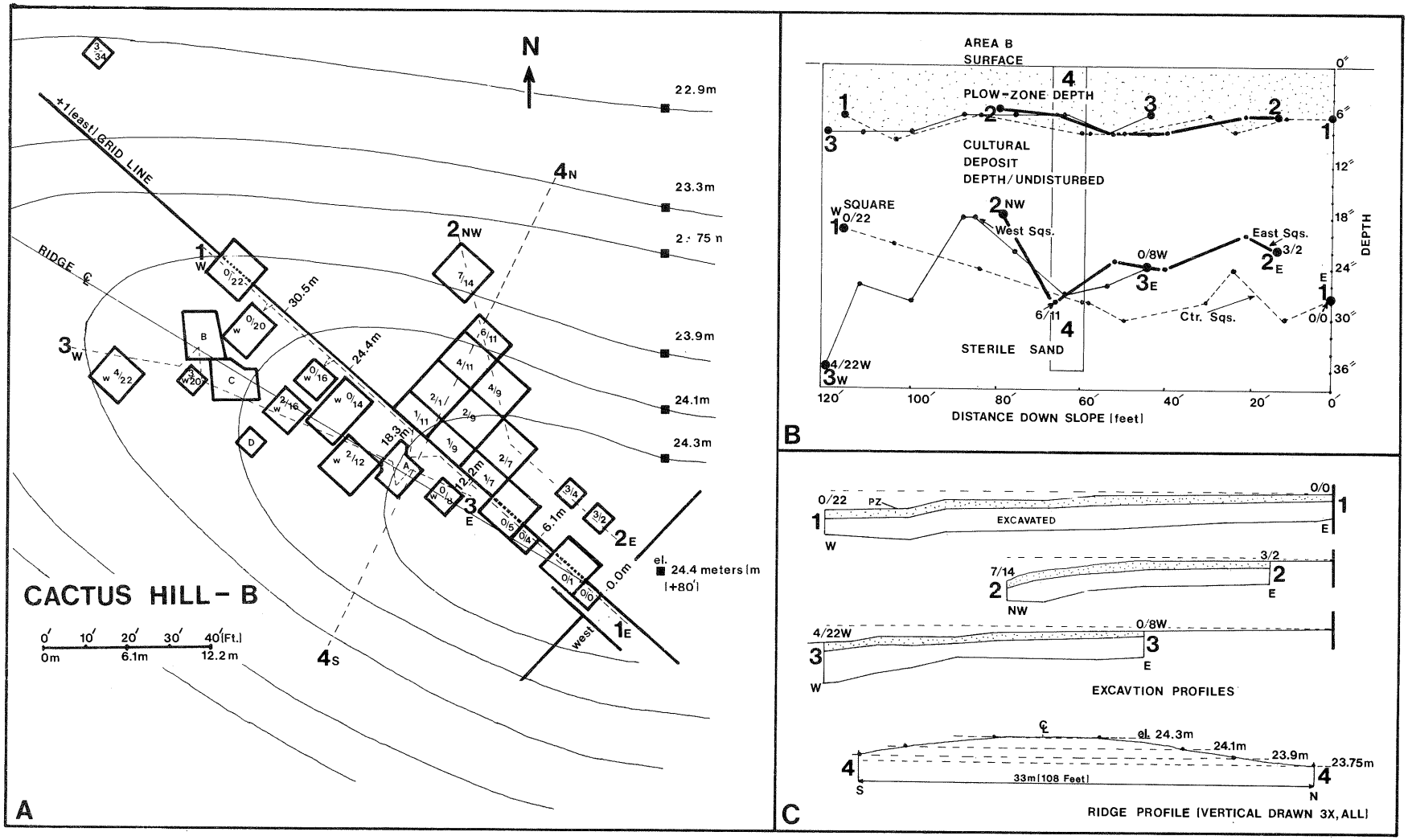


Figure 5.2. Excavation Plan and Profile, Cactus Hill Area B.

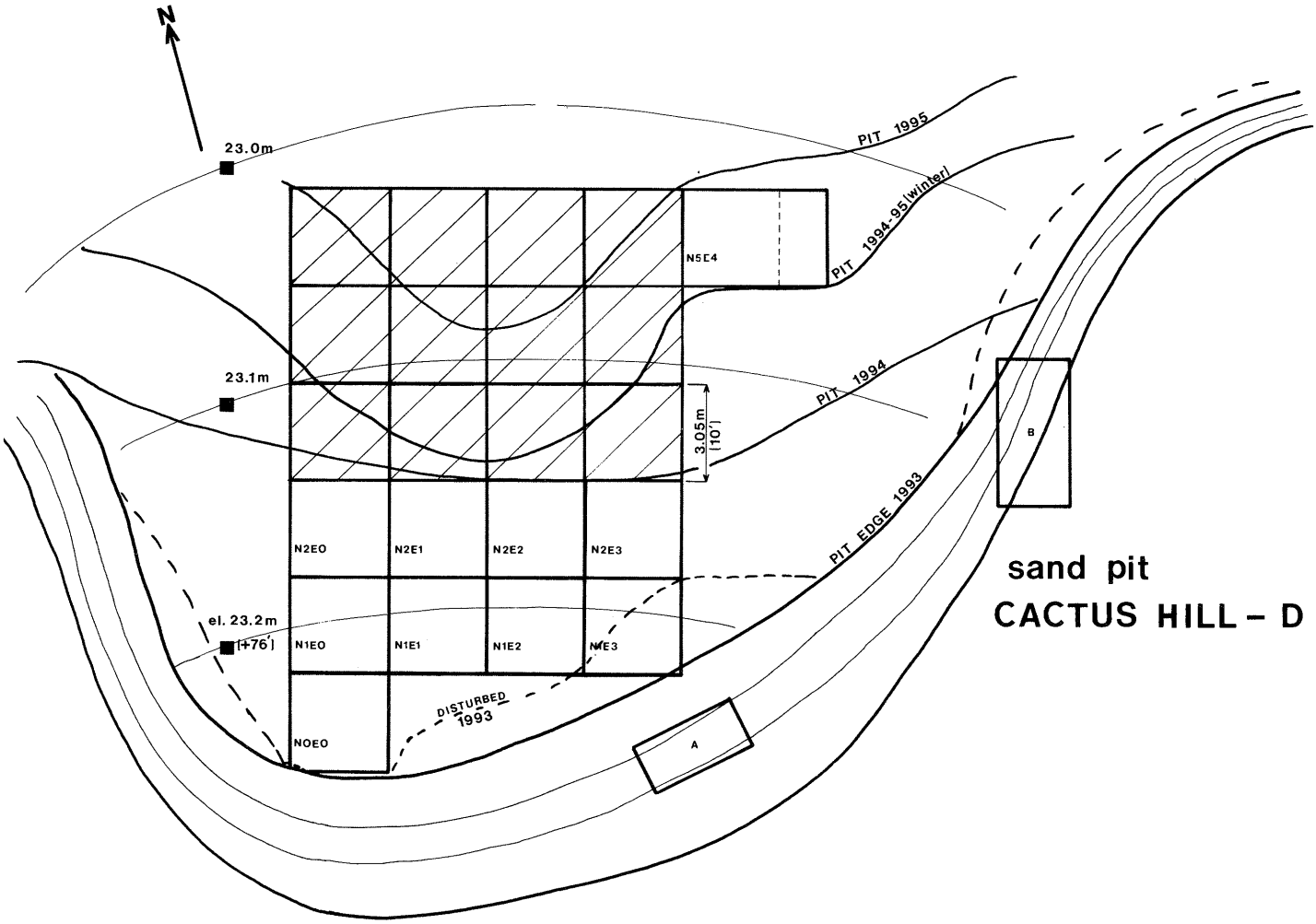


Figure 5.3. Excavation plan, Cactus Hill, area D, 1993 and 1994 (square N5E4) excavations.

Zone I (Ap horizon), a very dark grayish brown (10YR3/2) to black organic filled sand, a cultivated or tilled top soil filled with wood debris from tree farm activity. This zone was generally 5 to 8 inches (12.7 to 20.3 cm) thick. There were few artifacts remaining in this soil in most locations in area B. Zone I was mechanically removed from all of the areas excavated in October 1993. Several salvage excavations undertaken in 1994 examined this area with minimal results.

Zone II (B horizon), a yellow brown (10YR5/4) medium-fine sand 1 to 3 inches (2.5 to 7.6 cm) thick. This zone in some areas contained Middle Woodland artifacts. In one location a pit of Middle Woodland age was dug from this zone downward as deep as 8 inches.

Zone III (B horizon), a yellowish brown (10YR5/6), medium-fine sand with a lamellar (banded) structure. This zone was approximately 60 inches deep (152 cm). Cultural material was quite dense in the top 12 to 24 inches (30.5 to 61 cm) of this zone, and where the cultural material ended, normally there was a slight color change to a lighter yellowish brown. This zone contained artifacts of Middle Woodland to Paleoindian age. There was only one area (level) in one excavation unit (4/22) in area B where sterile sand was observed between successive occupations. There was a general trend from more recent to older cultural material from top to bottom of the cultural deposit in Zone III. Generally, however, in the areas of heavier occupation in Zone III there was a "till" of intermixed Archaic age material. Away from the areas of heavier occupation, to the southeast or northwest of the center of the ridge, cultural stratigraphy was somewhat better preserved. The bottom four to five feet of Zone III was sterile and produced no cultural or organic material other than a few modern roots.

Zone IV (B horizon - 2BT?), a dark yellowish brown (10YR4/4), weathered clay or paleosol. This is a sterile sandy clay or weathered clay which has produced no cultural or organic material other than a few modern roots. Thickness varies to about 12 inches deep (30 cm).

Zone V (B horizon - 2BTG?), a mottled light gray plus brownish yellow clay (10YR7/1 + 10YR6/8). This is a sterile clay which has produced no cultural or organic material other than a few modern roots. Thickness was several feet, and under this zone fluvial sands and gravel were encountered in core samples by Johnson and Jones.

Excavation Area D Soils and Stratigraphy

Area D soil zones and cultural stratigraphy are as shown in Figure 5.1. The five soil zones are defined as:

Zone I (Ap horizon), a very dark grayish-brown organic filled sand (10YR3/2), with wood debris from tree farm activity. This zone was generally 8 to 14 inches (20.3 to 35.6 cm) thick. Zone I was mechanically removed from all of the areas excavated in 1993. Zone I was examined in the 1994 excavation, but produced almost no debitage or fire cracked rock. No diagnostic artifacts were recovered.

Zone II (B horizon), a yellow brown (10YR5/4) medium sand, generally 4 inches (10 cm) thick. This zone was mechanically removed from all of the areas excavated in 1993. Zone II was examined in the 1994 excavation, but produced very little debitage or fire cracked rock. No diagnostic artifacts were recovered.

Zone III (B horizon), a yellowish brown (10YR5/6 to 6/6), medium sand. This zone was approximately 36 inches (91 cm) thick. Cultural material was of light to moderate density in the upper 24 to 26 inches of Zone III. In some areas thin layers (strata) of almost sterile sand separated strata of cultural materials. Area D, Zone III was therefore determined to be culturally stratified, a micro-stratigraphy, with a relatively high degree of integrity in many areas. Occupations in area D represented the Late, Middle and Early Archaic periods. No Paleoindian material has been observed in this area of the site. Below the cultural materials, the sand in Zone III was a somewhat lighter yellowish brown color, and continued for an additional 12 inches (30.5 cm).

Zone IV (B horizon), a yellowish brown (10YR5/6 to 6/6), coarse to very coarse sand several inches thick and separating the medium sand in Zone III from the fluvial deposits below. This zone was sterile, except for a few modern roots.

Zone V (B horizon), a light yellowish brown

10YR7/4, very coarse sand with pebbles. This formation, coarsened and continued downward for an additional 8 feet. This zone was sterile.

Area D Archaeological Excavations

Excavation area D at Cactus Hill was investigated intermittently from 1989 through early 1993 and intensively in October 1993 and October 1994 (Figure 5.4). The earliest test excavations, conducted in 1989 and 1990 as salvage in areas of active sand removal, produced the sequences shown in Figure 5.5. The two excavations marked area D (A) and (B) were south (A) and east (B) of the excavations conducted in 1993 and 1994. The two test excavations, totaling approximately 200 square feet produced 10 diagnostic artifacts which were considered to be in proper chronological sequence. The time period represented was ca. 10,000 B. P. to ca. 8,000 B. P. The investigations in area D through 1994 have refined the overall culture sequence and have demonstrated the integrity of the culturally stratified deposits in this area of the site.

The area D deposits were found to be as deep as 45 inches below surface, but more typically in the range of 35 to 40 inches (89 to 102 cm). The general stratigraphy of area D was presented as Figure 5.1.

Two excavations in area D, Figure 5.3, represent the primary work at this area of the site. The 1993 excavation examined 800 square feet of this area in the form of eight connected 10 foot squares. The 1994 excavation (unit N5E4) examined an additional 150 square feet in a single unit, for the purpose of carefully collecting carbon for 14C dating and soil samples from features for flotation recovery of plant remains. (Less emphasis was placed on lithics/debitage analysis in the 1994 excavation as the sample was small and since tool and debitage analysis was the primary purpose of the much larger 1993 excavation.) The two excavations were on the same grid pattern, and they will be considered together. In total, 1,150 square feet (107 square meters) were excavated in area D at Cactus Hill, including the early test work.

The 1993 excavation was conducted as four groups of south-to-north oriented adjacent blocks, and these blocks were composed of 3 units, 2 units, 2 units, and 1 unit from west-to-east respectively. Blocks were designated E0, E1, E2, and E3. The 1994 excavation was placed three units to the north of the 1993 excavation and was designated unit N5E4 of block E4. The individual blocks and the depth of the excavation units are given in Table 5.1.

Each unit within a block was individually excavated by volunteer field crews. While this resulted in some variability in data recovery methods, most of the excavation units were approached in a similar manner. These units were mechanically stripped of the top 16 inches (±) and then hand cleaned by flat shovel to undisturbed soil. This removed all of soil zones 1 and 2 of Figure 5.1. The 1994 excavation was done entirely by hand from the surface.

The 1993 area D datum (Figure 5.2) was four feet below the area B datum and placed near the western most edge of unit N1E0. This location was down slope to the river from the ridge center which was approximately at the location of square N1E2. Based upon the datum location, squares to the east (N2E1, N1E2, N2E3) were upslope and slightly higher. Thus, living surfaces encountered for individual cultural periods were observed to slope upward to the east and therefore appeared more shallow relative to the area D datum point. For the 1994 excavation the datum was moved 25 feet north and closer to square N5E4, but this resulted in the datum dropping 3 inches (7.6 cm) below the 1993 datum. This should be considered when comparing data.

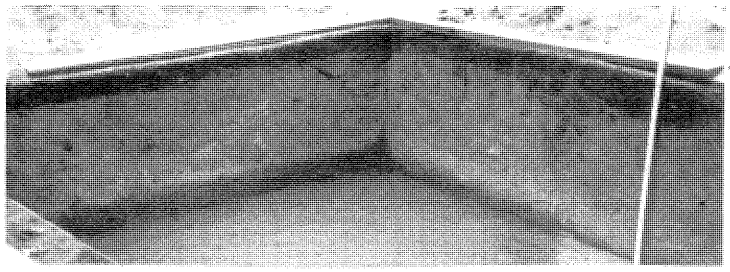
From Table 5.1 it is observed that, relative to datum, completion depths of excavation units in 1993 ranged from 37.62 to 41.25 inches below surface. Excavated blocks (after surface removal) were 19.13 to 24.76 inches thick, and were conducted in 5 to 11 formal levels. Many of the formal levels were excavated as split or multiple sublevels. This allowed diagnostic and formal artifacts to be recovered within the tighter control offered by the sublevels. Debitage, however, was separated only by the formal levels.

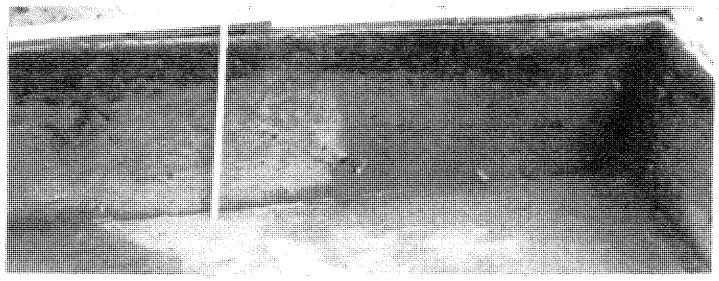
All levels excavated in area D were of arbitrary thickness with no geological significance as they were all in soil zone 3. The excavated depth of levels within the various units varied somewhat based upon the field crew working the unit and the nature of the soft sandy soil. The average depth of each level in each unit within the area D excavation is given in the debitage and artifact tables. Generally, an attempt

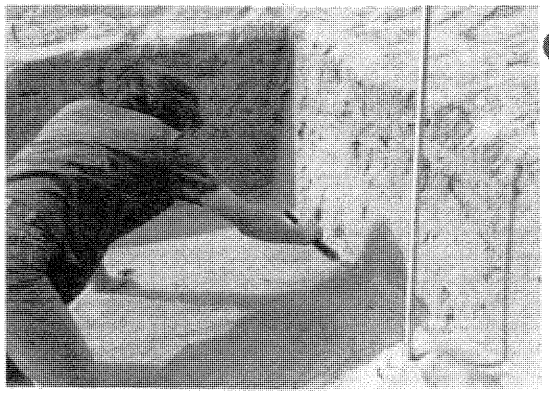
Table 5.1. EXCAVATION BLOCKS AND UNITS, OCTOBER 1993 AND 1994, AREA D, CACTUS HILL

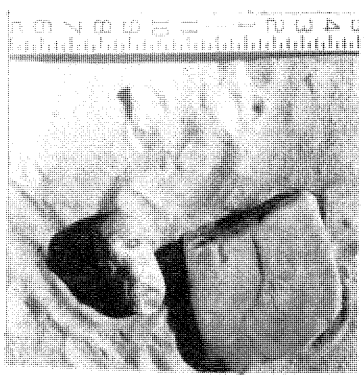
Block and Unit	Starting Depth*	Completion Depth*	Excavated Block Thickness	Number of Levels
Block E0	Surface mechanically removed			
Unit N0E0	16.75" (42.55 cm)	38.06" (96.67 cm)	21.31"	6 (5 split levels)
Unit N1E0	16.75" (42.55 cm)	37.62" (95.55 cm)	20.87"	11
Unit N2E0	16.50" (41.90 cm)	39.70" (100.84 cm)	23.20"	8 (2 split levels)
Block E1	Surface mechanically removed			
Unit N1E1	18.75" (47.63 cm)	38.02" (96.56 cm)	19.27"	9
Unit N2E1	19.0" (48.26 cm)	38.13" (96.85 cm)	19.13"	9
Block E2	Surface mechanically removed			
Unit N1E2	16.0" (40.64 cm)	40.76" (103.53 cm)	24.76"	5 (3 split levels)
Unit N2E2	14.0" (35.56 cm)	38.5" (97.97 cm)	24.50"	8 (1 split level)
Block E3	Surface mechanically removed			
Unit N2E3	17.0" (43.18 cm)	41.25" (104.78 cm)	24.25"	9 (2 split levels)
Block E4	Excavation started by hand at surface			
Unit N5E4	Level 1 recorded at 12" (30.48 cm) below surface	42" (106.68 cm), 45" below 1993 datum	42.0" (30" recorded)	8

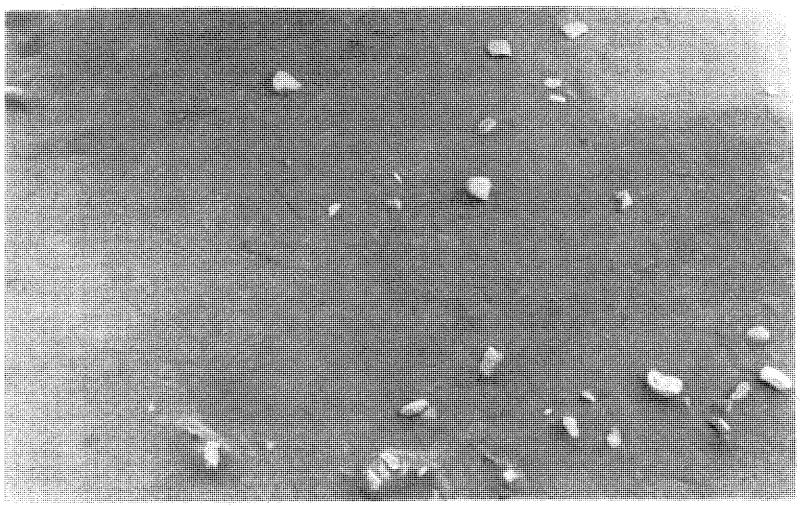
*Average depth below surface at datum











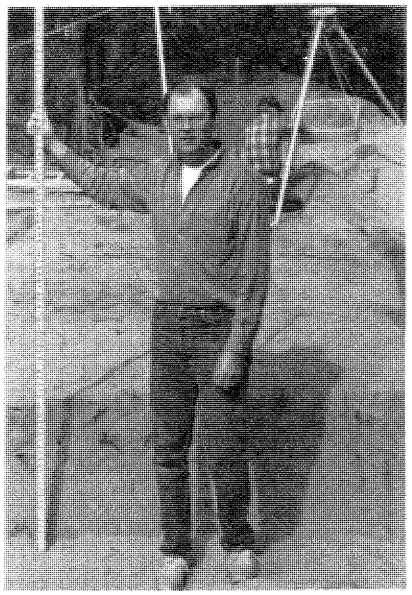


Figure 5.4. Cactus Hill Area D.
A and B, square N5E4, October 1994; C, and G, 1993 excavations.
D, Morrow Mt. I feature, square N2E0, level 2.
E, Morrow Mt. II feature, square N2E1, level 1.
F, Morrow Mt. I working surface.

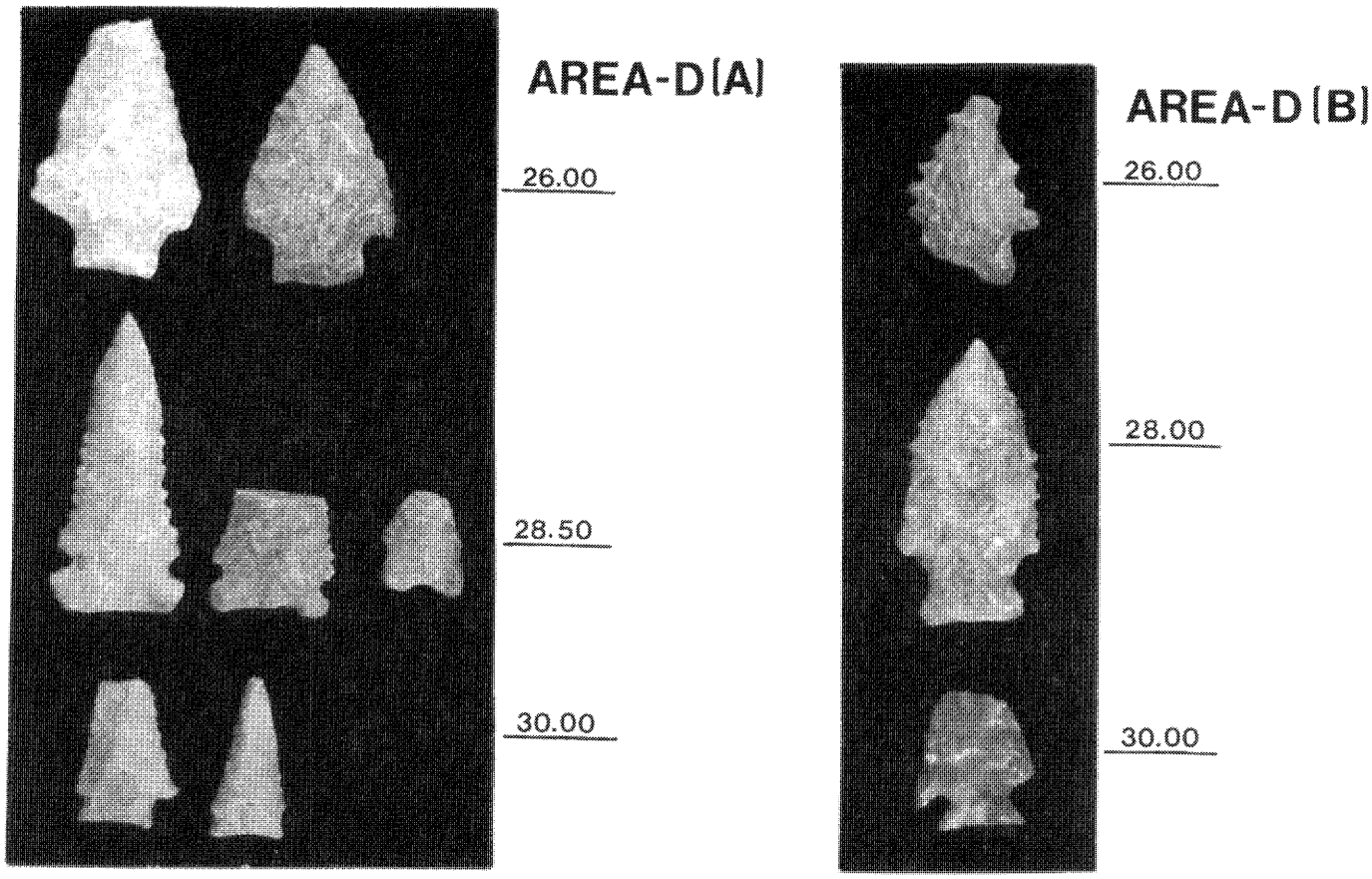


Figure 5.5. Diagnostic artifact sequences, in depth (inches) below surface, excavations in area D at Cactus Hill. Area D (left) south of 1993/1994 work, area D (right) east of 1993/1994 work.

was made by most of the field crews to hold the level (or split level) thickness within 2 to 4 inches (5 to 10 cm). The depth of the level must be considered when comparing the number of artifacts and weight of materials recovered from specific levels of any unit.

The majority of the diagnostic artifacts (projectile points) recovered in the area D units were recovered *in situ* as a result of the flat shovel skimming technique used by most crews in this excavation. As diagnostic artifacts were recovered, they were recorded as to position and depth relative to the datum by transit and rod. Thus, the depth given for most of the diagnostics relative to datum is accurate within ± 0.50 inch. The primary contribution to this overall project of the 1993 area D excavation at Cactus Hill was to establish a culture sequence for the Early and Middle Archaic periods based upon relative depth of diagnostic artifact types and associated tools and debitage. The general integrity of area D of the site, which had been recognized as very good as early as 1990, coupled with the simultaneous excavation of an area of 800 square feet (74 square meters) allowed for enough material to be excavated to clearly establish culture sequence. This sequence is based upon 84 diagnostic projectile points/hafted bifaces, most of which are shown in Figures 5.6 through 5.13 in the sequences in which they were excavated. The area D culture sequence will be described in more detail as the 1993 and 1994 excavations are reviewed below.

Area D produced 22 recorded features (Table 5.2) over the eight units excavated in 1993. (This number is thought to be artificially low which may be attributed to the placement of emphasis on lithics in the 1993 work. The individual features from each level of each excavation are shown on the original field excavation maps retained in the files of NRS.) While most features represented by hearth stones and flake and tools clusters were well recognized and recorded, other features types, recognized in the 1994 excavation were not observed. Feature types not observed in 1993 include shallow concentrations of carbonized wood/nut shell, small pit hearths without hearth stone, and other light stains and carbon scatters in the sand. (The 1994 excavation, which was placed to the east of the area of the 1993

excavation, was much smaller and was conducted over a longer period with more emphasis on recognition of subtle features not normally recognized in sandy soils.) This excavation revealed between 21 and 24 features (Figure 5.14) in 150 square feet, which is thought to be more typical of the feature density in this area of the site. An extensive effort was put into the feature identification phase of the 1994 excavation. Small, light stains and clusters of carbon particles were intensively investigated to determine if features were indicated. This degree and intensity of investigation of sandy archaeological deposits is not normally a practical approach given time and funding constraints. (Note that the 1993 feature designations were changed in 1995 to a system indicating excavation unit and level. Former feature numbers are also given where there is a reference to them from an appendix.)

Across the 8 excavation units examined in 1993, the upper levels of unit N0E0 of block E0 produced two Savannah River bifaces above Halifax projectile points. Blocks E1, E2, and E3, to the east of block E0, were upslope and probably were stripped of working surfaces of ca. 5,000 B. P. and later by mechanical site preparation. The detailed excavation of unit N5E4 in 1994, however, did encompass this period, but produced only one diagnostic artifact, a small stemmed projectile point. In general, there was less use made of area D of the site in the Late Archaic than in the Middle and Early Archaic. Heavy site use started in the Halifax period of ca. 5,000 B. P. Also, no pottery fragments were observed in this area thus reflecting an absence of discernible Woodland period use.

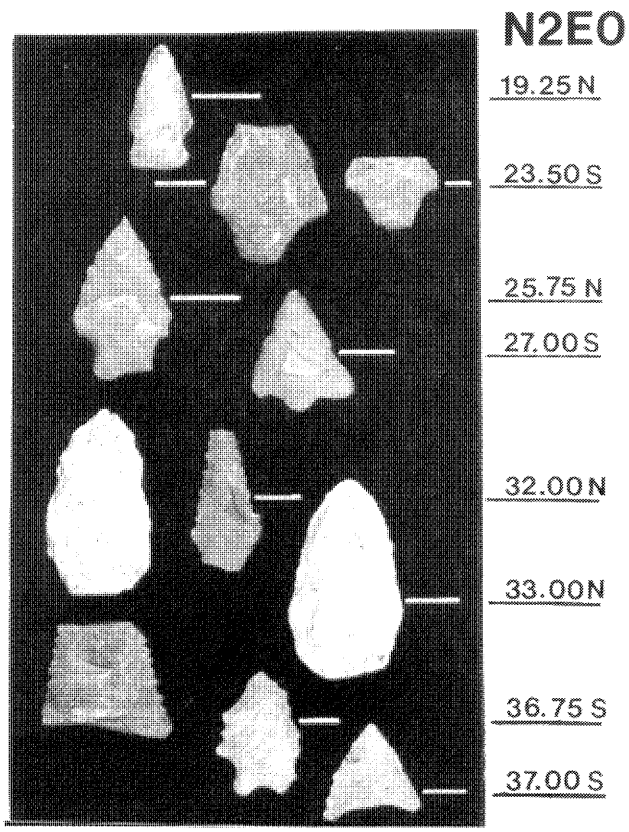


Figure 5.6. Diagnostic artifact sequence as excavated in October 1993 unit N2E0, area D, Cactus Hill. 19.25" N, Halifax; 23.50" S, Morrow Mt. II; 25.75" N, untyped bifurcate base; 27.00" S, Morrow Mt. I; 32.00" N, Kirk Serrated; 33.00" N, biface - Kirk Serrated level; 36.75" S, St. Albans; 37.00" S, serrated tip (rhyolite). (Note: All numerical values in this figure are inches below datum, with datum set at 0.00" at surface. N=north end of square; S=south end square).

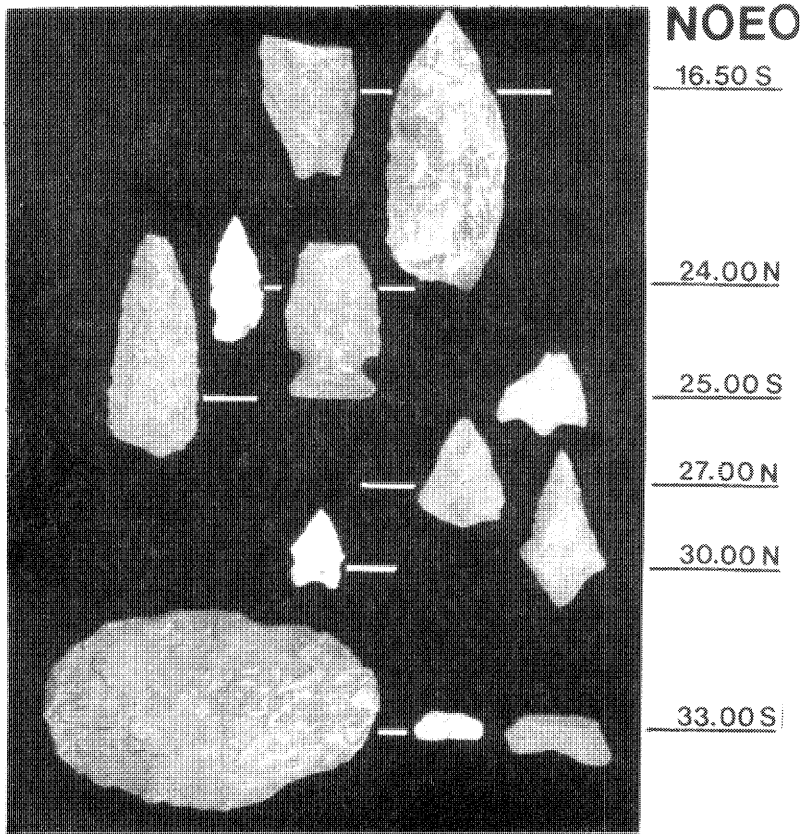


Figure 5.7. Diagnostic artifact sequence as excavated October 1993 in unit N0E0, area D, Cactus Hill. 16.50" S, Savannah River (reject stage) and Savannah River biface (unstemmed); 24.00" N, Halifax; 25.00" S, Morrow Mt. II; 27.00" N, Morrow Mt. I; 30.00" N, LeCroy; 33.00" S, Kirk Corner Notched and Fort Nottoway basal fragments, and large Fort Nottoway side scraper (rhyolite). (See note, Figure 5.6).

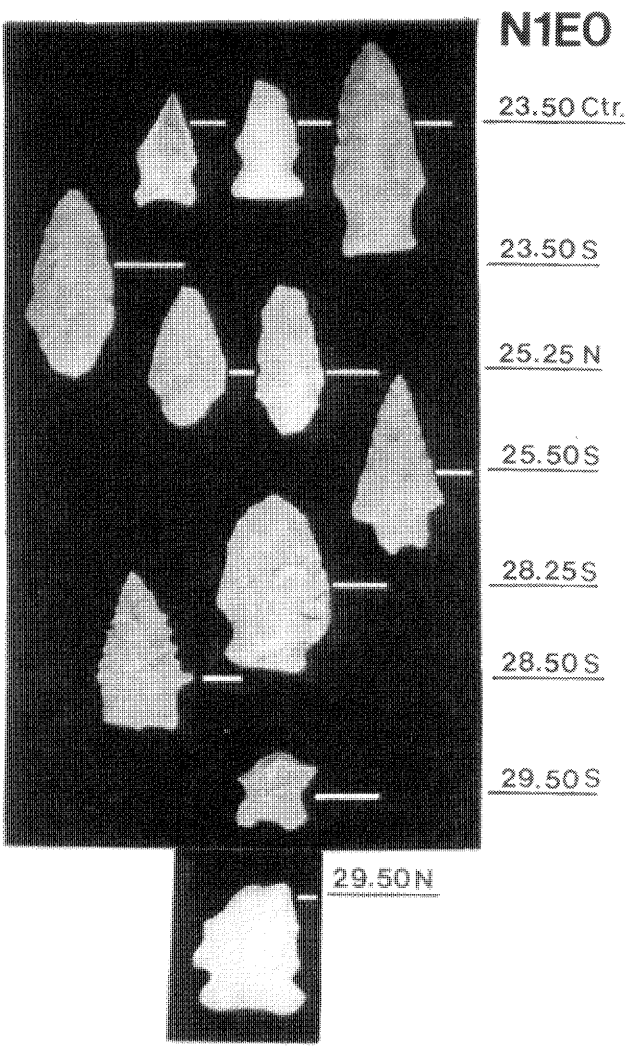


Figure 5.8a. Diagnostic artifact sequence as excavated October 1993 in unit N1E0, area D, Cactus Hill. 23.50" ctr. (center of square), Halifax; 23.50" S, Morrow Mt. II; 25.25" N, Morrow Mt. II; 25.50" S, Stanly; 28.25" S, untyped notched point; 28.50" S, Kirk Serrated (rhyolite); 29.50" S, St. Albans (rhyolite); 29.50" N, Fort Nottoway. (see note Figure 5.6).

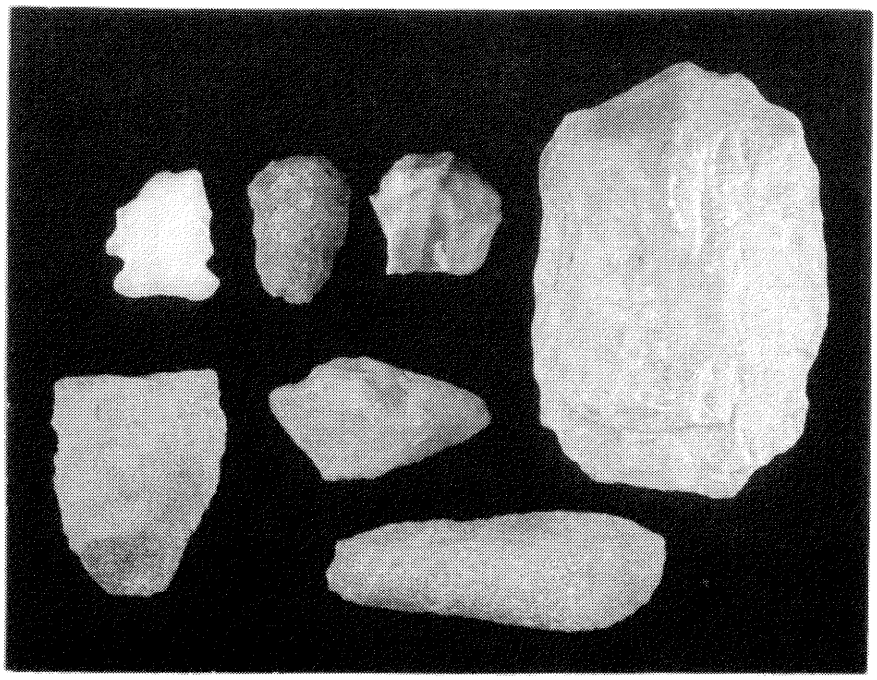


Figure 5.8b. Artifacts associated with Fort Nottoway (levels 7 and 8) of unit N1E0 presented in 5.8a above. Top row (from left), Fort Nottoway point, end scraper, end scraper, bifacial ax or celt. Bottom (from left), large side scraper, pointed edge worked flake, used flake (bottom right). Artifacts submitted for CIEP (residual protein) analysis (see Appendix F).

Table 5.2. 44SX202, CACTUS HILL AREA D, MAJOR IDENTIFIABLE FEATURES NOTED BY SQUARE AND LEVEL 1993 AND 1994 EXCAVATIONS

Unit	Level	Feature # (Former feature #)	Feature Description/location	Feature Size/orientation	Components and Associations (Dates are B. P.)
N0E0	2	N0E0-2-F1	Pit hearth (bottom ?) northeast	18" x 23" x 3" (?) SE-NW	6 FCR, 2"-3" size, Halifax projectile point, calcined bone fragments
N0E0	2	N0E0-2-F2 (N0E0-F2)	Surface hearth northwest	24 " x 16" x 2" N-S	26 FCR, 1.5"-3" size, Morrow Mt. II projectile point, carbonized nut shell calcined bone fragments
N1E0	7-8	N1E0-7/8-F1	Large flake and tools cluster, surface hearth (?) northeast	70" x 24"+ x 2" E-W	Fort Nottoway point, bifaces, scrapers, chopper flakes, calcined bone fragments
N2E0	1	N2E0-1-F1	Pit hearth (bottom) southwest	18" x 16" x 3" circular	13 FCR, 1.5"-2.5" size, 2 Morrow Mt. II projectile points adjacent to hearth, calcined bone fragments
N2E0	2	N2E0-2-F1	Slab mortar/anvil stone and hammer (mano) stone northwest	10" x 10" x 2" circular zone	Mortar, hammer/mano and a Morrow Mt. I projectile point in same level, carbonized material under mortar, calcined bone fragments
N1E1	3-4	N1E1-3/4-F1	Surface hearth northwest	14" x 14" circular - very tight cluster	17 FCR 1"-3" size, Morrow Mt. II projectile point adjacent to hearth, calcined bone fragments
N1E1	6	N1E1-6-F1	Large flake and tool cluster southwest	36" x 27" x 2" E-W	2 Fort Nottoway points and cluster of flakes, bifaces, scraper, flake knives
N2E1	1	N2E1-1-F1	Surface hearth southeast	17" x 17" x 2"	11 FCR, 2"-3" size, Morrow Mt. II projectile point adjacent to hearth, carbonized nut shell, calcined bone fragments
N2E1	1	N2E1-1-F2	Surface hearth center square	30" diameter circular scatter of FCR	FCR scatter (20+ pieces), Morrow Mt. II projectile point in level, calcined bone fragments
N2E1	1	N2E1-1-F3	Surface hearth southeast	12" diameter, tight circular concentration of FCR	10 FCR, 2"-3" size, Morrow Mt. II projectile point in level, carbonized nut shell, calcined bone fragments
N2E1	2	N2E1-2-F1 (N2E1-F4)	Surface hearth southeast	13" diameter circular concentration of FCR	11 FCR, 1.5"-3" size, Morrow Mt. I projectile point adjacent to hearth, carbonized nut shell, calcined bone fragments
N2E1	4-7	N2E1-4/7-F1 (N2E1-F5)	Hearth - disturbed upward southwest	24" x 24" (approx.) x 6" ,disturbed, no FCR, carbon scatter circular	2 Palmer points - burned, jasper bifacial knife, chert flakes, calcined bone fragments, carbonized wood fragments
N2E1	6-9 (mostly 7-8)	N2E1-6/9-F1 (N2E1-F6)	Large pit hearth northeast to center	35" x 35" x 7" circular	Fire cracked Fort Nottoway point, flakes, carbonized wood, calcined bone fragments (14C 8,800 ±120; 8,920 ± 65)
N2E1	6-9	N2E1-6/9-F2	Deep pit filled with flakes and core fragments northeast	15" x 12" x 8" E-W	Large core fragments, blade-like bifacial core blades, general flakes and shatter from 4 cores of quartzite
N1E2	3 (split levels, 6th level excavated)	N1E2-3-F1 (N1E2-F1)	Basin filled with flakes and tools northeast	31" x 25" x 4" E-W	2 Fort Nottoway points and fragments of bifaces, tools and flakes, carbonized wood and nut shell
N2E2	2	N2E2-2-F1	Pit hearth bottom northeast	14" x 14" x 3" circular	8 FCR, 1.5" to 2.5" size, Guilford projectile point in level above
N2E2	2	N2E2-2-F2	Pit hearth bottom northeast (wall)	15" x (?) x 3" circular ?	7 FCR (showing), 2" to 2.5" size, Guilford in level above
N2E2	2-3	N2E2-2/3-F3	Pit hearth (bottom) or surface hearth southwest	18" x 18" x 2.5" circular	10 FCR 2" to 3" size, near Morrow Mt. II projectile point in level 3

Table 5.2. 44SX202, CACTUS HILL AREA D, MAJOR IDENTIFIABLE FEATURES NOTED BY SQUARE AND LEVEL 1993 AND 1994 EXCAVATIONS

Unit	Level	Feature # (Former feature #)	Feature Description/location	Feature Size/orientation	Components and Associations (Dates are B. P.)
N2E2	3	N2E2-3-F1 (N2E2-F4)	Pit hearth (bottom) or surface hearth and working surface with tools northwest corner	12" x 12" x 3" circular ±	7 FCR 1.5" to 3" size, intrusive in level containing Kirk serrated projectile point , net sinkers, carbonized wood, (14C 5,180± 60)
N2E2	5	N2E2-5-F1	Large flake and tools cluster center - east	45" x 34" x 3" NE-SW	2 Kirk Stemmed-Side Notched projectile points, scrapers, edged flakes, used cobbles and grinding stone, in flake concentration
N2E3	6	N2E3-6-F1	Large flake and tools cluster southwest	72" x 54" x 2.5" NE-SW	2 Fort Nottoway projectile points, edged flakes, side scrapers, choppers, flaked adz blade and flake concentration, calcined bone fragments and carbonized wood
N5E4	2	N5E4-2-F1 (N5E4-F1)	Pit hearth southeast	39" x 21" x 6" oval SW-NE	Late Archaic ?, carbonized hickory nut shell, no FCR
N5E4	2-9	N5E4-2/9-F2/9 (1) (N5E4-F2)	Pit (hearth ?) continues to level 9 southeast	42" x 36" x 27" oval E-W	Late in the Middle Archaic, carbonized hickory nut, no FCR, several calcined bone fragments
N5E4	2-9	N5E4-2/9-F9/2 (1) (N5E4-F9)	Continuation of pit hearth from level 2 (F2) southeast	60" x 36" x 27" oval with bell shaped expanding walls	Late in the Middle Archaic, carbonized hickory nut, no FCR, several calcined bone fragments, (14C 4,850 ±70)
N5E4	2	N5E4-2-F3 (N5E4-F3)	Pit hearth south	67" x 42" x 4" oval N-S	Carbonized hickory nut shell, no FCR (Late Archaic ?)
N5E4	1-2	N5E4-1/2-F4 (N5E4-F4)	Pit hearth southwest	37" x 30" x 3" oval E-W	One stemmed projectile point (Late Archaic?), same level, carbonized hickory nut shell, no FCR
N5E4	2	N5E4-2-F5 (N5E4-F5)	Pit hearth southwest	42" x 12"+ x 4" oval N-S	Carbonized hickory nut shell, no FCR (Late Archaic ?)
N5E4	3	N5E4-2-F6 (N5E4-F6)	Pit hearth west	36"+ x 27"+ x 5" oval N-S	Carbonized hickory nut shell, no FCR
N5E4	3	N5E4-3-F7 (N5E4-F7)	FCR - hearth west	25" x 23" x 2.75" circular	Carbonized hickory nut shell , 5 FCR
N5E4	3	N5E4-3-F8 (N5E4-F8)	FCR - hearth southwest	29" x 27" x 2.75" circular	One Morrow Mt. I projectile point, same level; below stemmed (Late Archaic) projectile point or drill tip, carbonized hickory nut shell, 4 FCR, Late Archaic (14C 4,070 ±80)
N5E4	4-5	N5E4-4/5-F10 (N5E4-F10)	FCR - hearth (shallow pit-like) southeast	12" x 10" x 4" circular scatter	Carbonized hickory nut, 6-8 FCR
N5E4	4-5	N5E4-4/5-F11 (2) (N5E4-F11)	FCR - hearth (concentration, very tight and pit-like FCR hearth) northeast	12" x 12" x 4" circular	Carbonized hickory nut shell, 6 FCR
N5E4	5	N5E4-5-F18 (2) (N5E4-F18)	FCR - hearth (concentration, very tight and pit-like FCR hearth) northeast	12" x 12" x 4" circular	Carbonized hickory nut shell, 4 FCR
N5E4	4	N5E4-4-F12 (N5E4-F12)	Hearth (scatter) (only 1/4 of feature in square) northeast	26" x 16" x 2.5" oval E-W	One quartz tool, carbonized hickory nut shell, one FCR fragment (Middle Archaic ?)

Table 5.2. 44SX202, CACTUS HILL AREA D, MAJOR IDENTIFIABLE FEATURES NOTED BY SQUARE AND LEVEL 1993 AND 1994 EXCAVATIONS

Unit	Level	Feature # (Former feature #)	Feature Description/location	Feature Size/orientation	Components and Associations (Dates are B. P.)
N5E4	4	N5E4-4-F13 (N5E4-F13)	Hearth scatter and flake concentration north	Hearth 15" x 12" x 3" circular Scatter 72" x 45" x 2"	Heavy concentration of small flakes (Middle Archaic ?), carbonized hickory nut shell, 4+ FCR fragments
N5E4	4	N5E4-4-F14 (N5E4-F14)	Hearth scatter and flake/tool/core scatter south	Hearth 9" x 9" x 2.5" circular Work area 51" x 33" x 2.5" E-W (Some hearth stones scattered beyond work area)	Worked flakes, cobble hammer, cores, flakes, carbonized hickory nut shell, 6+ FCR fragments (Middle Archaic ?)
N5E4	4	N5E4-4-F15 [3] (N5E4-F15)	Hearth area, FCR below surface east	14" x 13" x 4" circular	Carbonized hickory nut shell, 4+ FCR fragments, calcined bone fragments
N5E4	5	N5E4-5-F17 [3] (N5E4-F17)	Hearth area, FCR below surface east	14" x 13" x 4" circular	Carbonized hickory nut shell, 2+ FCR fragments, calcined bone fragments
N5E4	5	N5E4-5-F16 (N5E4-F16)	FCR - hearth (very tight) southeast	9" x 9" x 3" circular	Fragment of Kirk Stemmed point directly below hearth stones, carbonized hickory nut shell, 6+ FCR fragments, early Middle Archaic
N5E4	5	N5E4-5-F19 (N5E4-F19)	Hearth area center	35" x 30" x 2.5" circular	Carbonized hickory nut shell and wood, burned flakes and shatter, calcined bone fragments, 4 FCR fragments
N5E4	6	N5E4-5-F20 (N5E4-F20)	Slab mortar (large) northeast	9" x 10"	Kirk Stemmed point 4" above mortar , one Decatur point approx. 3" below mortar, quartz end scraper adjacent to mortar, carbonized wood and nut shell, small flakes of quartzite and rhyolite, age (?)
N5E4	5-6	N5E4-5/6-F21 (N5E4-F21)	Hearth area (pit-like) north	48" x 18" x 6" oval N-S	One small white quartz biface, carbonized wood and hickory nut shell, no FCR (This feature was intrusive from a higher level?)
N5E4	7	N5E4-7-F22 (N5E4-F22)	Basin hearth and tool cluster east	Hearth 42" x 39" x 4" circular Tool cluster 108" x 60" x 4" E-W	Three Decatur points adjacent to hearth (six from level 7), many unifacial tools, carbonized wood and lesser amounts of carbonized hickory nut shell, 200 pieces calcined bone, no FCR, many flakes of black rhyolite - matches one adjacent Decatur point (14C 9,140 ±50, 9,240 ±190)
N5E4	7-8	N5E4-7/8-F23 (N5E4-F23)	Tool cluster and open hearth area in center northwest	42" x 33" x 2.5" oval E-W	Three Corner Notched Kirk-like points (ground basal margins - older Kirk type/large Palmer) and unifacial tools of quartzite, small amount of carbonized wood, burned flakes and tools, no FCR; ca. 9,300 B. P. (?)
N5E4	8	N5E4-8-F24 (N5E4-F24)	Tool cluster, surface hearth? south to southeast	84" x 35" x 3" oval S-W	One Palmer point, one jasper end scraper, one wedge, flakes, other tools, small amount of carbonized wood. burned jasper flakes, no FCR; ca. 9,400+ B. P. (?)

Notes: [1] Feature F9/2 is an extension of feature F2/9
[2] Feature F11 overlaps feature F18, and may be the same (?)
[3] Feature F15 overlaps feature F17, and may be the same (?)

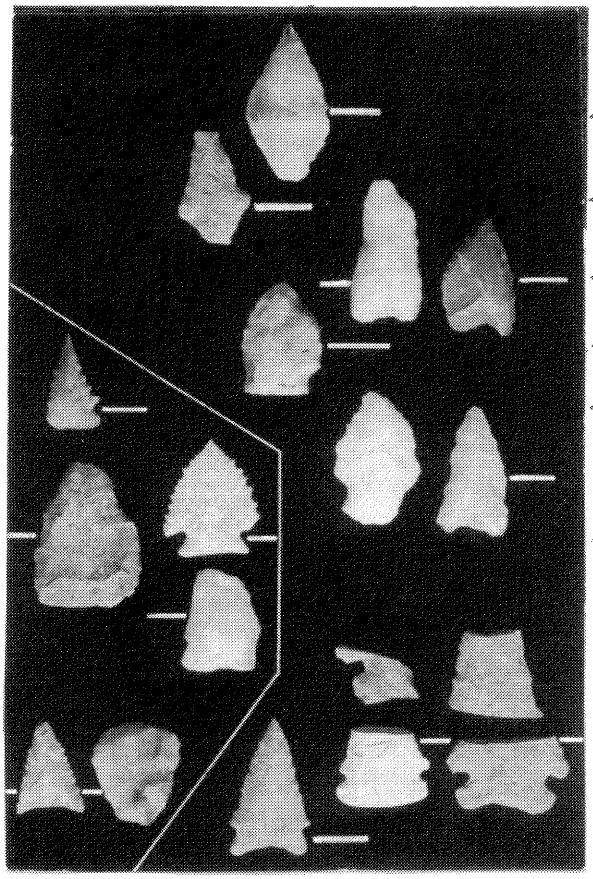


Figure 5.9. Diagnostic artifact sequence as excavated October 1993 in unit N2E1, area D, Cactus Hill. 22.25" N, Morrow Mt. II; 24.25" S, Morrow Mt. II; 25.25" N, untyped bifurcate point or resharpened Morrow Mt. I points/tools; 26.00" N, untyped stemmed point/Kirk Serrated (?); 27.50" S, Palmer - disturbed hearth; 29.50" N, triangular or bifurcated biface, and stemmed uniface - untyped; 29.50" S, Palmer; 33.25" S, Palmer - used as wedge; 33.25"N, Plevna (rhyolite), and Fort Nottoway; 33.75" S, Palmer tip and end scraper - disturbed hearth; 34.25" N, Decatur-like. (see note, Figure 5.6). Lined area to left is an elevated area and disturbed hearth at the south end of the square.

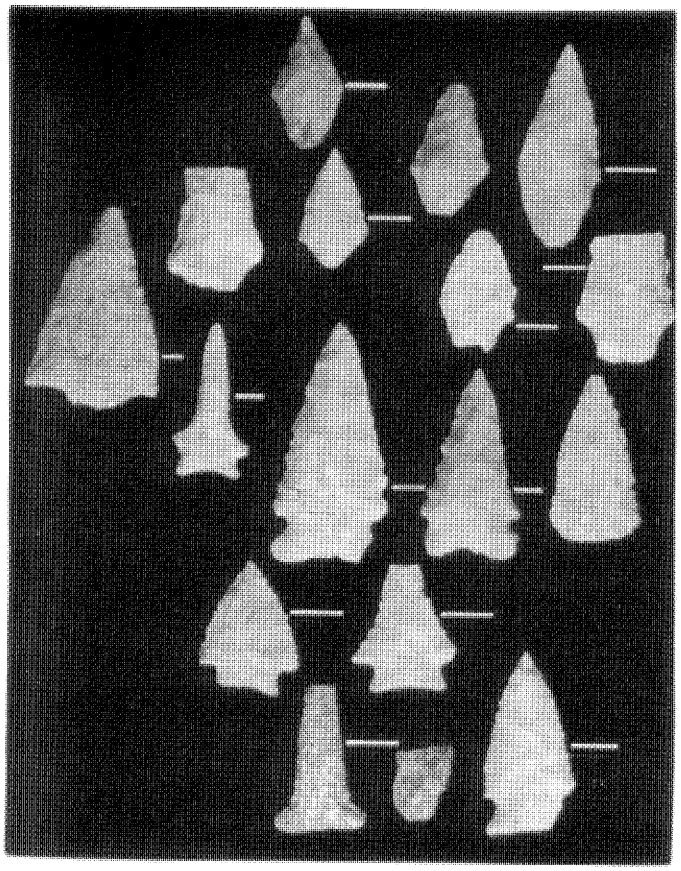


Figure 5.10. Diagnostic artifact sequence as excavated October 1993 in unit N1E1, area D, Cactus Hill. 18.75" N, Morrow Mt. II; 19.50" S, Guilford; 21.00" N, Morrow Mt. II; 21.50" S, Kirk Serrated; 26.00" S, Stanly (?) - weakly stemmed; 28.50" S, Decatur drill; 30.25" S, Fort Nottoway points (2); 32.00" ctr (center of square), Decatur points (2); 35.00" S, Palmer point, drill, and edge worked flake of same jasper as drill. (see note, Figure 5.6).

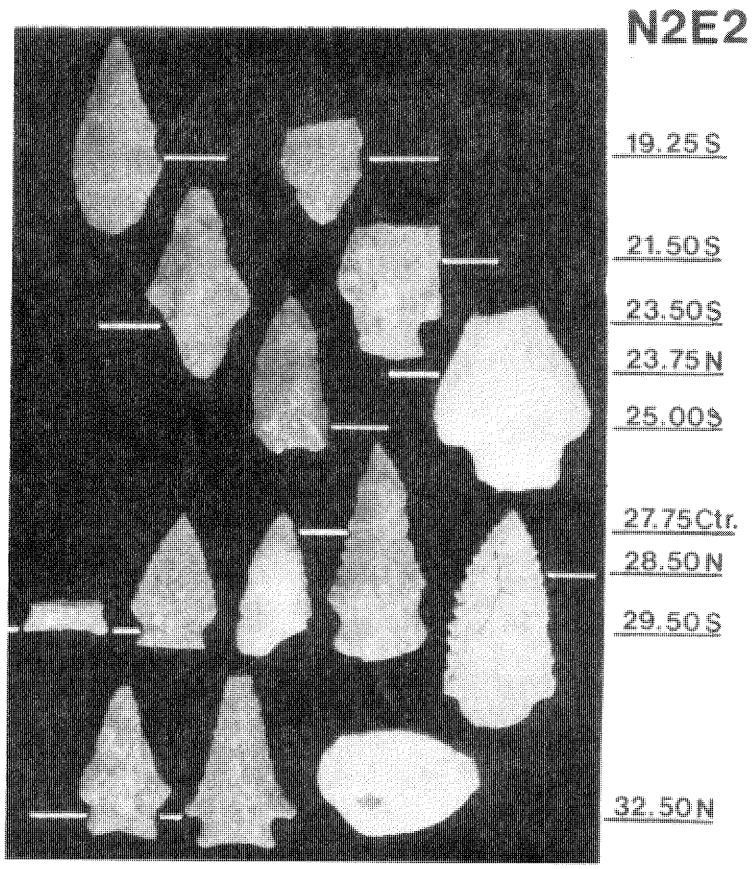


Figure 5.11a. Diagnostic artifact sequence as excavated October 1993 in unit N2E2, area D, Cactus Hill. 19.25" S, Guilford; 21.50" S, Kirk Stemmed or Side Notched; 23.50" S, Morrow Mt. II; 23.75" N, Kirk Serrated; 25.00" S, unshouldered bifurcate or Morrow Mt. I tool/resharpened point; 27.75" ctr. (center of square), Kirk Stemmed or Side Notched points (2); 28.50" N, Kirk Serrated (silicified slate or tuff); 29.50" S, Decatur points (2); 32.50" N, Decatur points (2), flake knife (rhyolite). (see note, Figure 5.6).

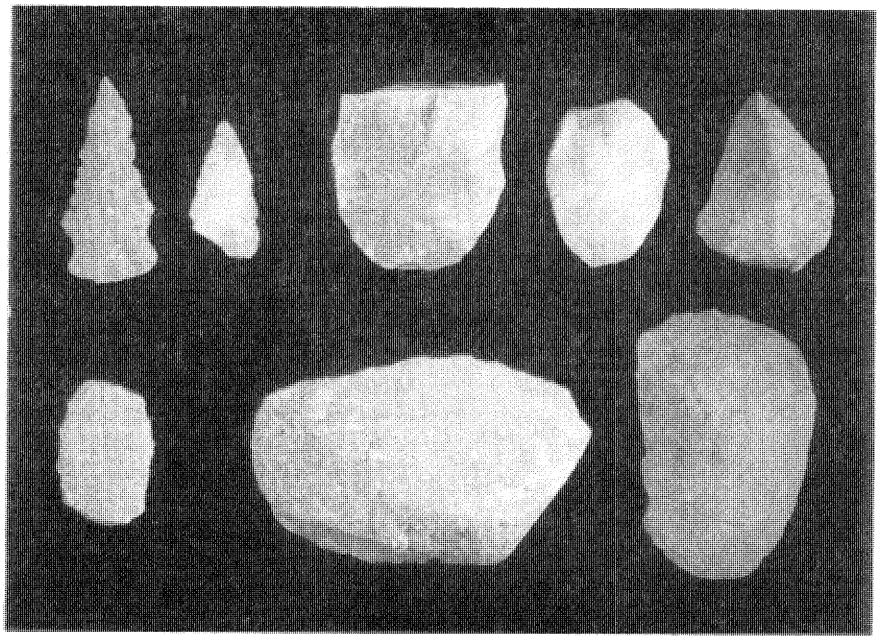


Figure 5.11b. Artifacts associated with Kirk Stemmed or Side Notched points at 27.75" ctr., in unit N2E2, Figure 5.11a above. Artifacts were recovered in tool cluster with points. Top row (from left), two Kirk projectile points - resharpened to discard stage, biface fragment with large dark brown stain, end scraper, pointed edge worked flake. Bottom row (from left), edged flake, side scraper/knife, utilized flake. Artifacts submitted for CIEP (residual protein) analysis - Appendix F.

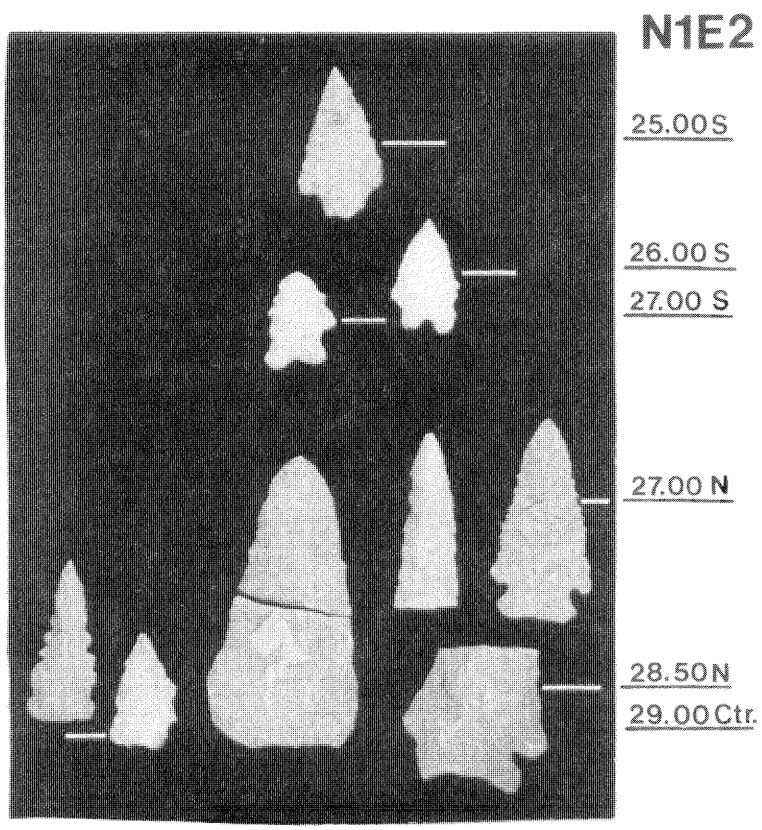


Figure 5.12. Diagnostic artifact sequence as excavated October 1993 in unit N1E2, area D, Cactus Hill. 25.00" S, Kirk Serrated; 26.00" S, LeCroy; 27.00" S, St. Albans; 27.00" N, Kirk Corner Notched or Fort Nottoway (?); 28.50" N, Fort Nottoway; 29.00" ctr (center), Kirk Side-Notched, and bifurcated (?) or Kirk Side-Notched. (see note, Figure 5.6).

The Upper Levels of Area D - Halifax (ca. 5,000 B. P.)

Halifax tradition use was recorded in the upper levels of units N0E0, N1E0, and marginally in N2E0 (Figures 5.6, 5.7, and 5.8a). One feature, (N0E0-2-F1) recorded in Table 5.2, a pit hearth, was clearly identified as associated with a Halifax projectile point (Coe 1964) in level 2 of unit N0E0, and hearth-like scatters of fire cracked rock also were encountered in Halifax levels of N0E0 and N1E0. The latter, however, were not clearly identified as features. Most of the formal lithic artifacts were thick elongated bifaces of quartzite as noted in Table 5.6, level 3. Edge-used and roughly edge-worked flakes and core fragments were numerous. Little lithic material other than quartz and quartzite was recovered. The debitage and in-process bifaces were quartzite, although four of the six Halifax points/hafted bifaces from area D were small reject stage forms of quartz and only two were of quartzite. This suggests that discard bifaces of quartz were being replaced by new quartzite tools.

Carbonized hickory nut shell and calcined bone fragments were abundant across the working/living floors of the E0 units in the Halifax period. Pit hearths dating to the Halifax period were found in both area D and area B of the site, and were intrusive into earlier working surfaces indicating a fairly extensive use of Cactus Hill by these people. Cactus Hill appears to have been an active quarry site and residential camp. Square N5E4 produced no diagnostic artifacts of the Halifax tradition, but a deep pit filled with over 200 grams of carbonized hickory nut shell dated to the Halifax period. This feature, (N5E4-2/9-F9/2+F2/9) shown in Table 5.2 and Figure 5.14, was sampled by flotation and the results, which suggest multiseasonal use, are

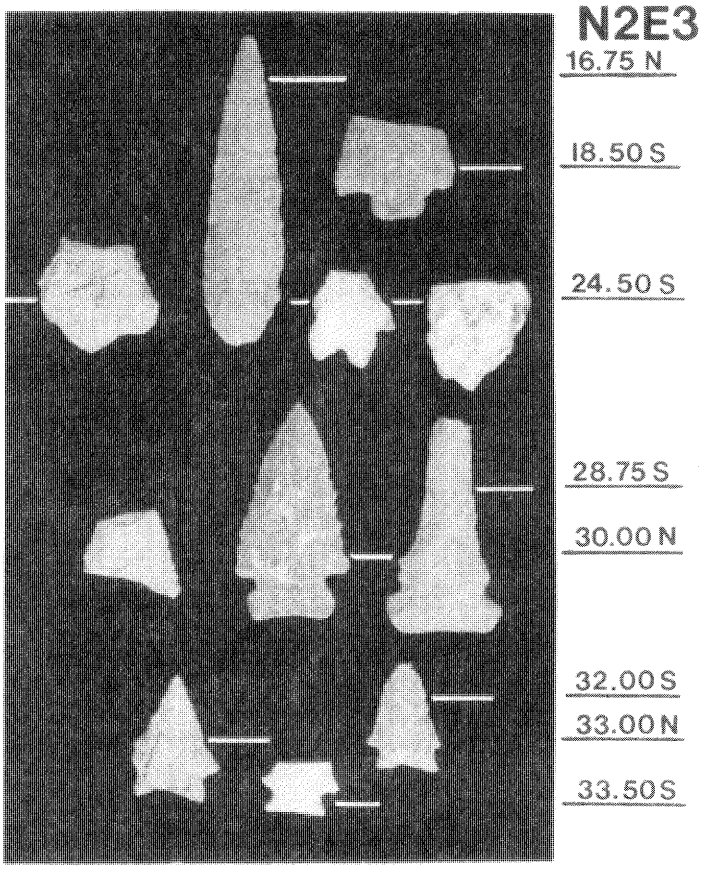


Figure 5.13a. Diagnostic artifact sequence as excavated October 1993 in unit N2E3, area D, Cactus Hill. 16.75" N, Guilford; 18.50" S, Kirk Serrated (?); 24.50" S, Morrow Mt. I and LeCroy; 28.75" S, Fort Nottoway; 30.00" N, Fort Nottoway; 32.00" S, Decatur; 33.00" N, Decatur; 33.50" S, Decatur. (see note, Figure 5.6).

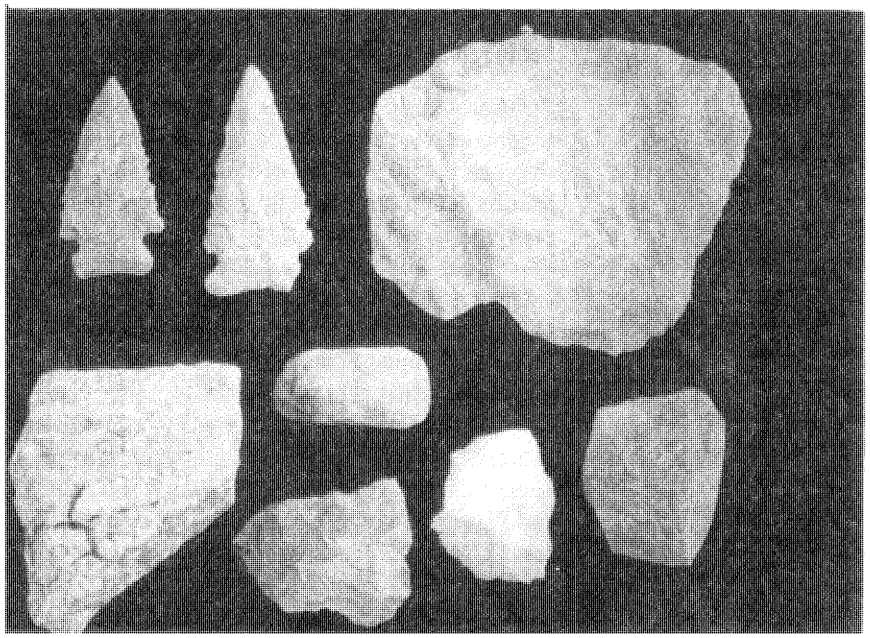


Figure 5.13b. Artifacts associated with Fort Nottoway points at 30.00" N in unit N2E3, (except second point from left - top row - from unit N1E1) Figure 5.13a above. Top (from left) Fort Nottoway point, large edged flake chopper. Bottom row (from left), grinding stone fragment, flaked adz blade (top), edged flake (bottom), edged flake/graver, edge used flake. Artifacts submitted for CIEP (residual protein) analysis - Appendix F.

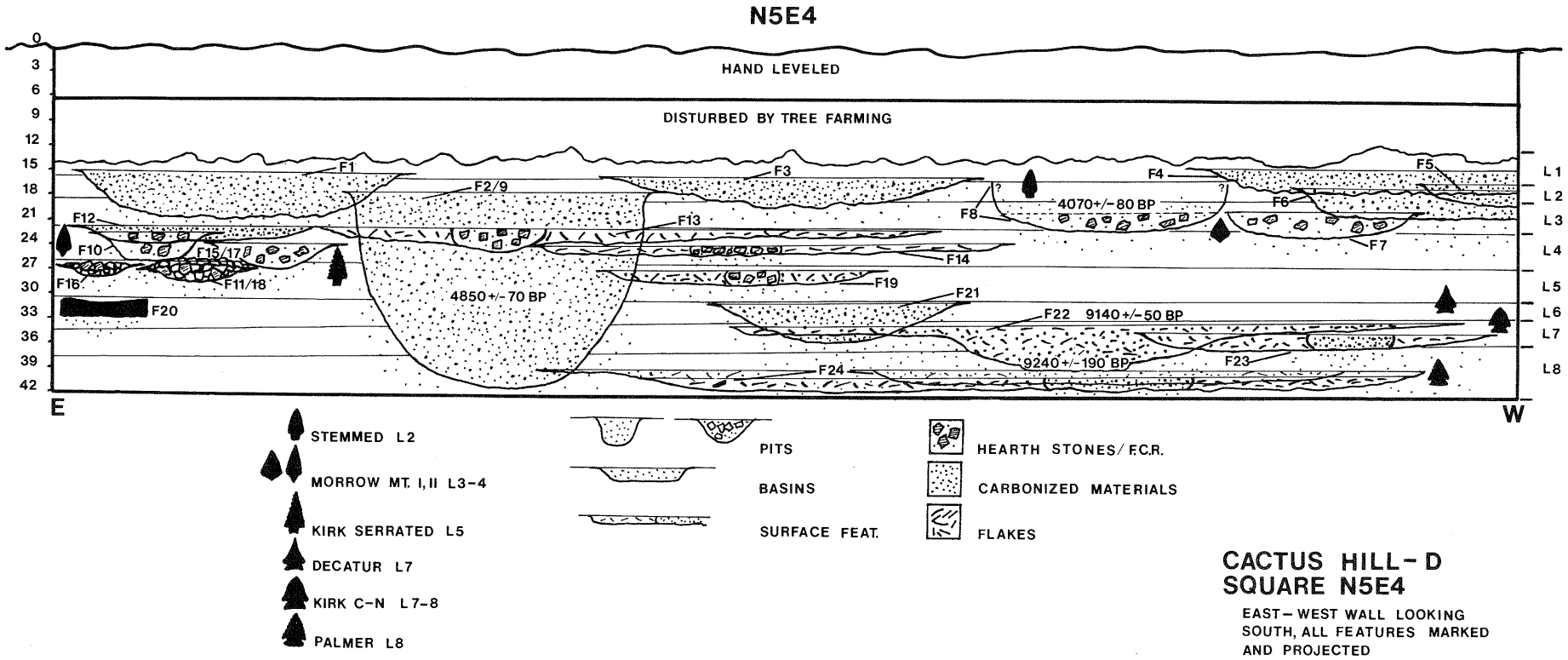


Figure 5.14. Features 1 through 24 in excavation unit N5E4 (October 1994), area D on Cactus Hill. All features are projected to the south wall looking through the excavation unit from the north.

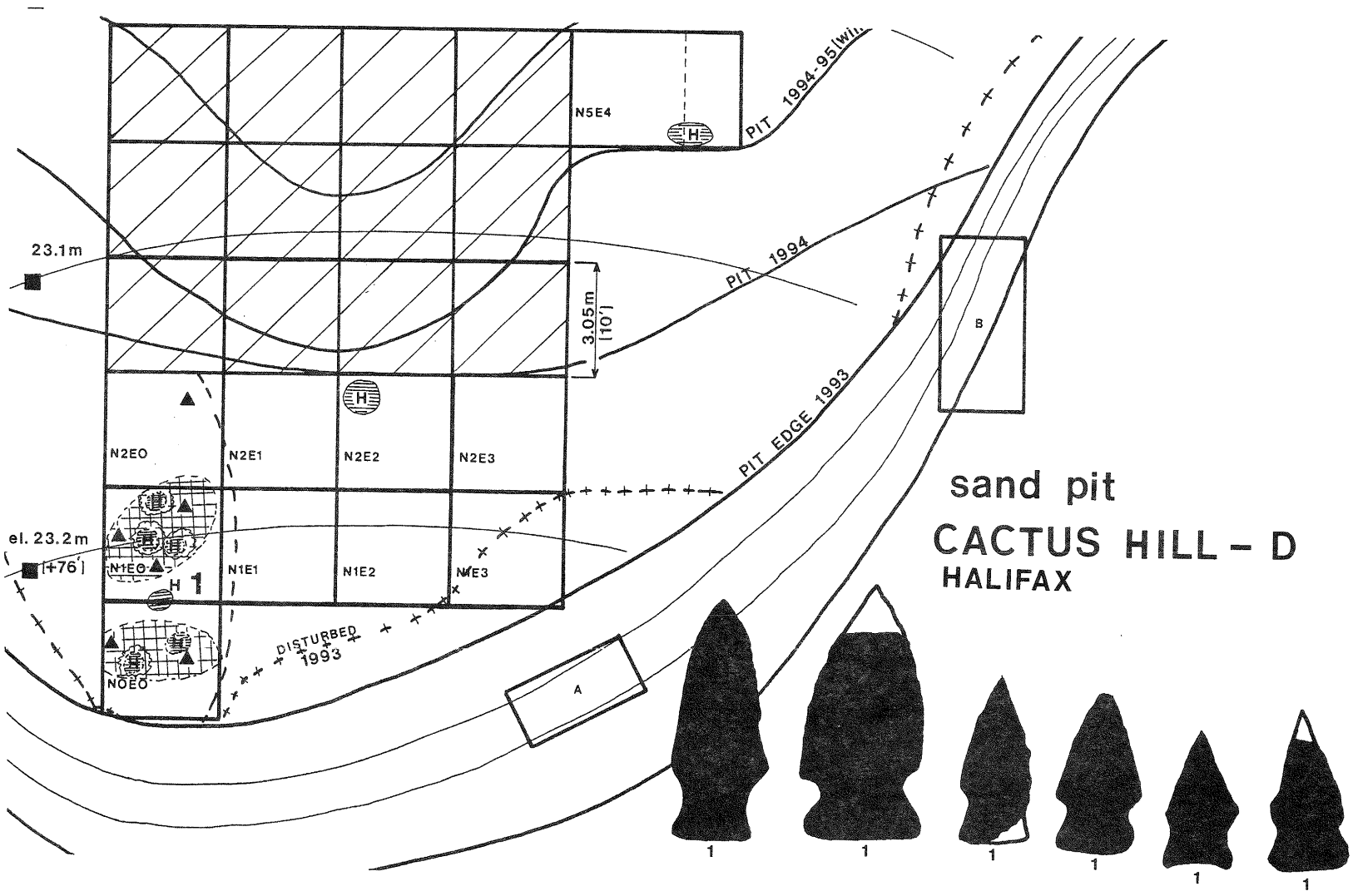


Figure 5.15. Halifax use areas, Cactus Hill area D, 1993 and 1994 (N5E4) excavations. Triangle=Halifax point, H=hearth, cross checked area=working surface. Silhouettes are recovered Halifax points from the use area indexed by number to the excavation plan.

described in Chapter 6. Figure 5.15 shows the extent of the Halifax diagnostic artifacts and features of approximate Halifax age in area D. Block E0 probably represents a remnant of the original material present as none of the remaining blocks produced Halifax points, but unit N2E2 did produce an intrusive hearth feature of Halifax age. Halifax use of this site seems to reflect diverse activities being carried out over wide areas. The area B horizontal distribution of artifacts (Figure 5.49) indicated use areas based upon Halifax projectile point distribution of at least 60 by 60 feet (18.3 x 18.3 meters).

The debitage, fire cracked rock (FCR), and formal artifact weights for Halifax from area D are represented best in Tables 5.3 and 5.5. These tables show ratios of FCR to debitage equal approximately to 2.5. A "typical" 10 x 10 foot square in area D produced about 20 lbs. of FCR and 8 lbs. of flakes in the Halifax containing levels. Flakes and shatter were in the range of 1,000 to 3,000 pieces per level per square, which was considered average to high. Weights of discarded and in-process tools (formal and informal) were relatively high at approximately 2.5 lbs. per level. Lithic technology involved both bifacial and bipolar reduction of quartzite and quartz cobbles, with bipolar reduction used primarily with quartz. The primary technology was bifacial core reduction.

Upper Mid-Levels of Area D - Morrow Mountain (ca. 6,400 to 7,200 B. P.)

Below the Halifax age material in area D the next major occupations are associated with the Morrow Mountain II and Morrow Mountain I traditions as defined by J. L. Coe (1964) and Jefferson Chapman (1979). Artifacts of these traditions were encountered in block E0, units N0E0 (levels 2-3), N1E0 (levels 3-4), and N2E0 (levels 1-2); block E1, units N1E1 (levels 1-3) and N2E1 (levels 1-2); block E2, unit N2E2 (levels 1-3); block E3, unit N2E3 (levels 3-4); and block E4, unit N5E4 (level 3). The Tables (5.3 through 5.26) associated with these blocks, units, and levels provide an inventory of lithics associated with the two traditions and some material associated with the later Guilford tradition (Coe 1964). The most numerous of the diagnostic points are Morrow Mountain II examples, which appear to be associated with seven pit hearths and surface hearths in units: N0E0 (feature N0E0-2-F2), N2E0 (feature N2E0-1-F1), N1E1 (feature N1E1-3/4-F1), N2E1(feature N2E1-1-F3), and N2E2 (feature N2E2-2/3-F3). These features are presented in Table 5.2. Carbonized wood and nut shell and calcined bone from some of these hearths were submitted for identification (Appendix D1 and Appendix E). The Morrow Mountain II tradition had been dated to 6,400 B. P. at the Slade Site, 3 miles upriver in the 1980s (Egloff and McAvoy 1990).

Morrow Mountain I diagnostics were generally recovered below Morrow Mountain II, and were associated with a mortar and two surface hearths in three features: units N2E0 (feature N2E0-2-F1), N2E1 (feature N2E1-2-F1), and N5E4 (feature N5E4-3-F8), Table 5.2.

In area D of Cactus Hill there was a continuum of projectile point types from small short stemmed Morrow Mountain I, through larger elongated stemmed Morrow Mountain II into the unstemmed round base Guilford (Coe 1964). This continuum was evident in squares N2E1, N1E1, and N2E2, terminating in the unshouldered or weakly shouldered round base Guilford points which are difficult to distinguish from some resharpened Morrow Mountain II examples.

Morrow Mountain I points were made from quartzite, soft gray-green argillite, and a similar weathered gray shale in this area of the site. Area B of the site produced many more examples of this point type. Fall Line chert and quartz were the primary choices in area B, but there was frequent use also of quartzite, argillite, and shale. Appendix A provides a summary and description of these distinctive hafted bifaces from area B of the site. The Morrow Mountain II and round base Guilford points were made almost exclusively of quartzite in area D of the site, although more variability in lithic choice was observed with the larger sample from area B. The area B sample included limited use of quartz, argillite, rhyolite, and other materials.

Bifaces recovered throughout the Morrow Mountain tradition included wide, thin oval forms, and thick elongated narrow rounded or oval forms. The smaller and thinner forms were more frequently associated with Morrow Mountain I, and the thick elongated narrow forms with Morrow Mountain II and possibly Guilford. Most completed bifaces and

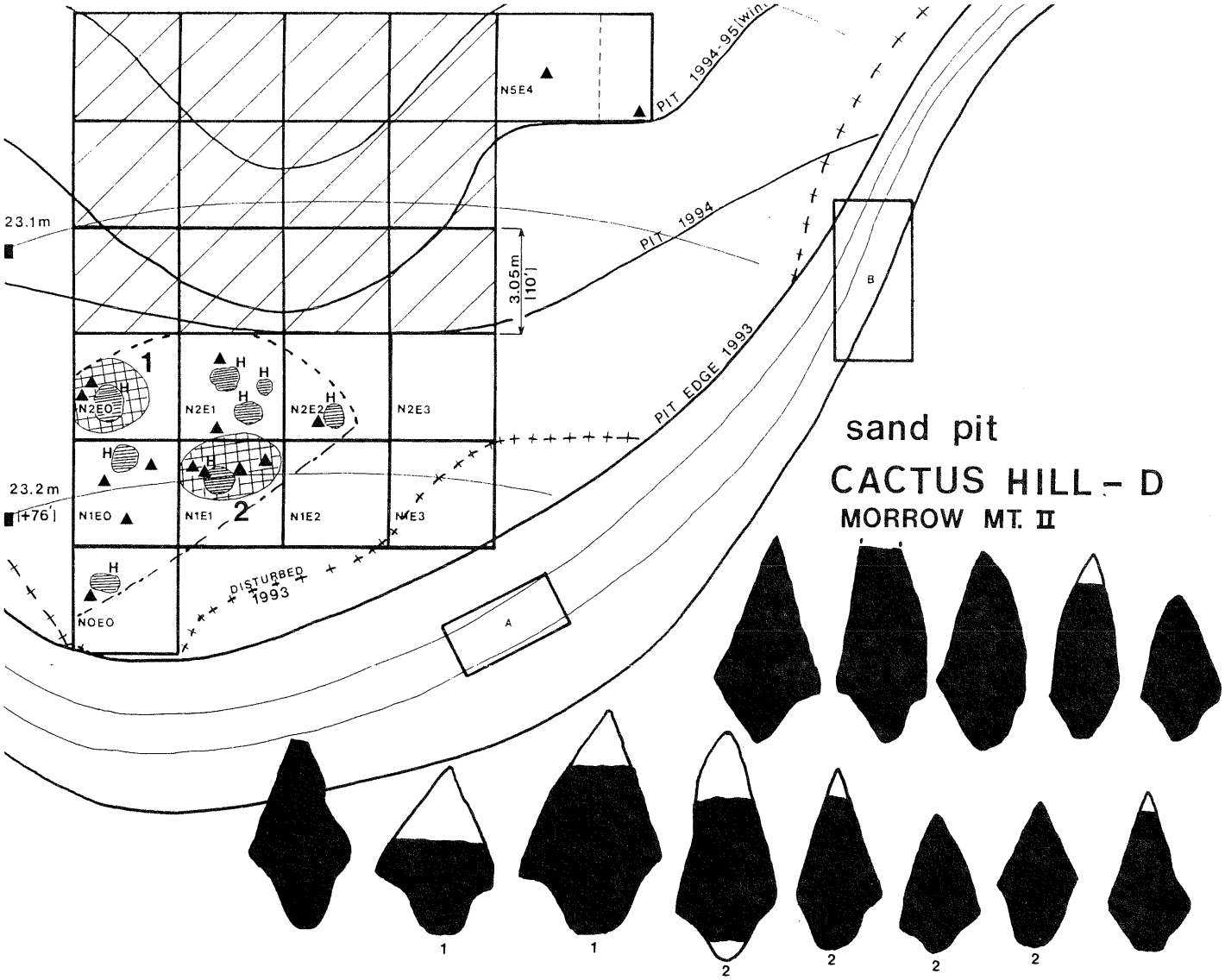


Figure 5.16. Morrow Mt. II use areas, Cactus Hill area D, 1993 and 1994 (N5E4) excavations. Triangle=Morrow Mt. II point, H=hearth, cross checked areas=working surfaces. Silhouettes area recovered Morrow Mt. II points from the use areas indexed by number to the excavation plan.

in process rejects were made of quartzite, but some use was observed of quartz and a few examples were recorded in the tables of rhyolite, argillite, and green silicified slate (metavolcanic/silicified sediment or tuff).

Tools associated with these traditions include hammerstones, roughly flaked notched axes, anvil/mortar stones, bifaces, roughly edged flakes and core fragments, core choppers, utilized flakes, bipolar core fragments possibly used as wedges, tabular abrading stones/abrading surfaces, rubbed paint stone (iron oxide - ore - burned) fragments, and roughly edged unifacial and bifacial side scrapers. It is unclear that even roughly made end scrapers were used by these traditions. Some unifacial edged tools are present, but they are rare and while associated with both Morrow Mountain I and II traditions, they are more frequently found with Morrow Mountain I.

Flakes of materials other than quartzite and quartz include argillite, green silicified slate, chert and jasper - often burned brown or red, and crystal quartz. Most of these flakes were derived from small pebbles or cobbles by bipolar reduction. Generally, bipolar cobble reduction is evident throughout the Morrow Mountain traditions, but seems to have been more heavily utilized by Morrow Mountain I groups. Morrow Mountain II flake clusters contain more biface reduction flakes than those associated with Morrow Mountain I.

Much of the debitage in Morrow Mountain levels is composed of small irregular flakes and shatter, often red from exposure to fire. Morrow Mountain levels in 10 x 10 foot squares in area D at Cactus Hill on average contained hearth stones (FCR) in a weight ratio to flakes of 3:1 in eleven levels investigated. The four most heavily utilized areas contained approximately 20 lbs. of FCR and 7 lbs. of flakes and shatter in 4 inches thick strata. Flakes and shatter averaged 1,200 to 2,900 pieces per level in the heavily utilized areas. Formal artifact weights were variable across Morrow Mountain working surfaces, but hammerstones and mortars produced high weights in a few levels.

Figures 5.16 and 5.17 show the extent of the Morrow Mountain II and I diagnostics and features in area D. Morrow Mountain I use areas in area D, as shown in Figure 5.17, were fairly small and associated with flake clusters, hearths, and slab mortars. Use areas in area D appear to have been approximately 10 by 10 feet or 100 square feet (9 square meters). It is interesting that concentrations of Morrow Mountain I projectile points in area B at Cactus Hill seem to be continuous over areas as large as 70 by 30 feet to areas as small as 30 by 30 feet (2,100 to 900 square feet - 195 to 84 square meters respectively), Figure 5.52.

Morrow Mountain II use areas, in area D, shown in Figure 5.16 seem to be continuous over an area at least 25 x 25 feet (625 square feet - 58 square meters). This includes numerous hearths, often closely spaced, and flake clusters. Carbonized nut shell and wood and calcined bone fragments are found with the hearth features. Use areas in area D of the site may have been much larger than noted here for Morrow Mountain II groups, but the size of the excavation limits more definitive use area estimates. In area B of the site, Morrow Mountain II projectile points were quite numerous, and they saturated the excavation units over a band 70 feet (21.3 meters) wide down the ridge centerline, Figure 5.51. Because of the number of such artifacts, individual use areas could not be isolated.

The numbers of diagnostic artifacts from the Morrow Mountain I tradition recovered at Cactus Hill are generally in the range of 25 to 35% of those associated with Morrow Mountain II. The lithic materials of many of the Morrow Mountain I artifacts, especially in area B of the site, were obtained from distances of 15 to 25 miles or more north and west of the site. Morrow Mountain II diagnostics were much less frequently manufactured of materials other than locally (site area) available quartzites.

The few Guilford projectile points (ca. 6,000 B. P.) recovered in area D of the site (Figure 5.18), appear to fall above Morrow Mountain II as reported by Coe (1964). The number of clearly defined Guilford points and associated features was too small to draw conclusions as to size of use areas. In area B, however, Guilford artifacts were much more numerous (Figure 5.50), and many tight concentrations of projectile points of diverse local material types were found near the ridge centerline. Guilford period use of the site seems to be reflected in small locally heavy concentrations of projectile points, probably around hearths, separated by areas

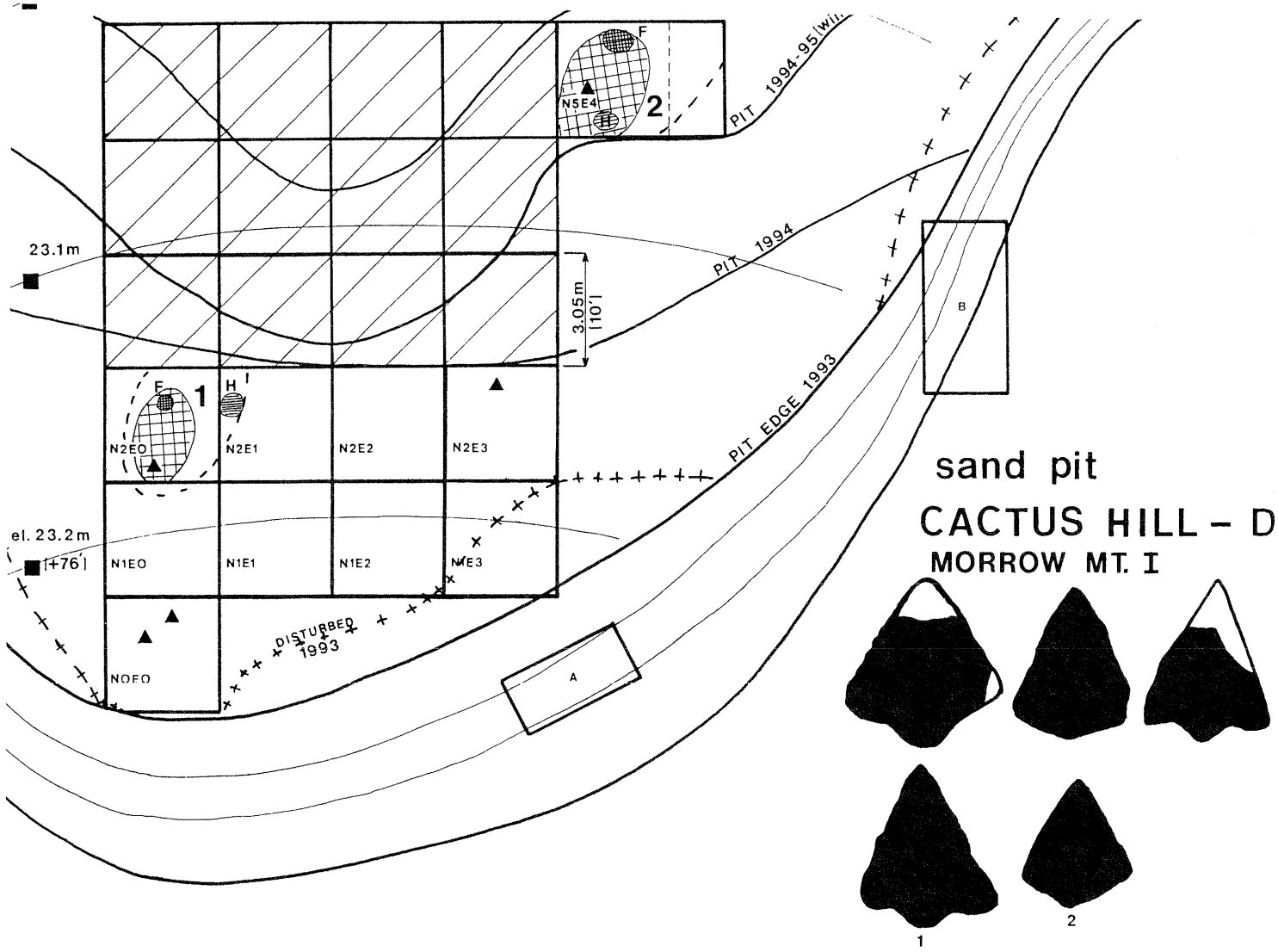


Figure 5.17. Morrow Mt. I use areas, Cactus Hill area D, 1993 and 1994 (N5E4) excavations. Triangle=Morrow Mt. I point, H=hearth, F=other type of feature (Mortar (F1), flake cluster F2)), cross checked areas=working surfaces. Silhouettes are recovered Morrow Mt. I points from the use areas indexed by number to the excavation plan.

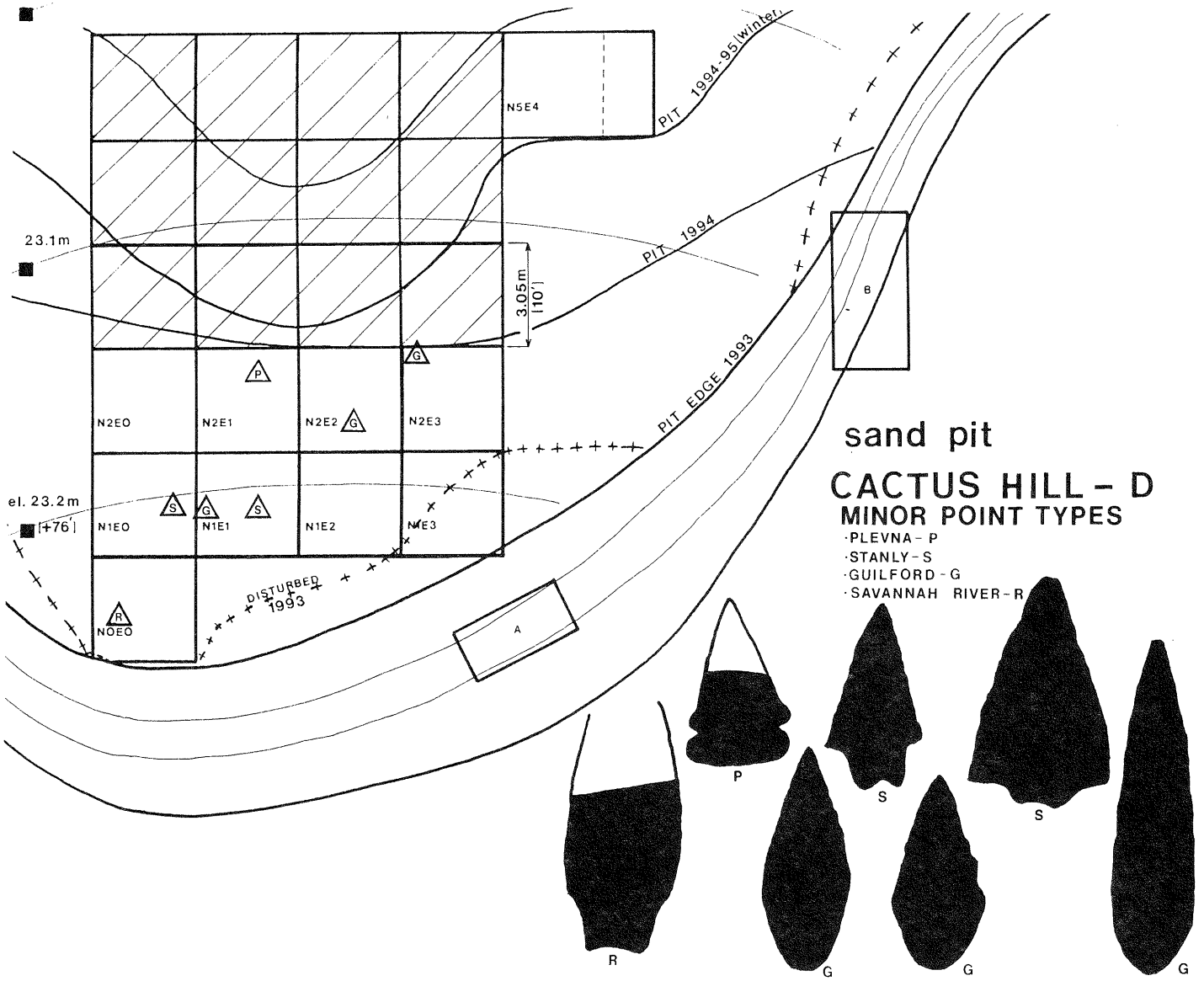


Figure 5.18. Minor point types recovery locations, Cactus Hill area D, 1993 excavation (none recovered in 1994 excavation - N5E4). Large triangles with coded letters are indexed to the point silhouettes by letter.

of low concentration. The area north of the ridge centerline produced a lighter more general scatter. In area B, concentrations appear to be no more than 25 by 25 feet (625 square feet - 58 square meters), and are in sharp contrast to the earlier Morrow Mountain II site use pattern, or overall use intensity.

Mid Levels of Area D - Stanly (ca. 7,400 B.P.) and Kirk Serrated (ca. 7,600 to 8,000 B. P.)

Stanly (ca. 7,400 B. P.)

Stanly (Coe 1964) tradition use of area D at Cactus Hill was minimal and represented by one projectile point and a possible second point (Figure 5.18). No features of Stanly age were recognized. The single identifiable point was recovered in block E0, unit N1E0 in level 4 below two Morrow Mountain II points and a fragment of a Morrow Mountain I point. The Stanly point was verified to be stratigraphically lower in the level than the other artifacts. A Kirk Serrated point was found in level 6, below the Stanly. Area B at Cactus Hill produced only twelve Stanly points, one cluster of three, two occurrences of two points together, and five unassociated finds (Figure 5.53). There were no associated features, but it was noted that nine of the twelve points were near (within 15 feet) the ridge center line. A single cluster of Stanly artifacts from an area B location produced an oval base bifacial knife with resharpened incurvate edges. Fifty percent of the quartzite Stanly points from areas B and D on Cactus Hill were made of red thermally altered fine grain quartzite. Nine of the twelve points recovered in area B were near concentrations of Kirk Serrated points. Stanly period use of Cactus Hill appears to have been very light, and this parallels the light concentrations of Stanly age material in this region on the Nottoway River. A single feature at the Stanly level of excavation unit 7C3 on the Slade Site, 3 miles upriver, produced a 14C date of 7,420± 160 B. P.

Kirk Serrated (ca. 7,800 B. P.)

Thirteen Kirk Serrated projectile points (Coe 1964) were recovered in area D at Cactus Hill and eleven of the points recovered in position are plotted in Figure 5.19. These artifacts were recovered in block E0, unit N1E0 (level 6) and unit N2E0 (level 4); block E1, unit N1E1 (level 3 and 5?); block E2, unit N1E2 (level 1) and unit N2E2 (level 3-5); block E3, unit N2E3 (level 1); and block E4 unit N5E4 (level 5). In four units with both point types present, Kirk Serrated points were excavated below Morrow Mountain points and working surfaces. Units with features, or possible features, include N2E0 level 4, with a possible Kirk Serrated working surface and flake cluster, and N2E2 with two projectile points and a similar working surface plus a small hearth with FCR (N2E2-3-F1). The hearth was later determined to be of Halifax age and intrusive into the Kirk working surface. Unit N2E3 level 1 produced a large hearth-like area with carbonized hickory nut shell and a Kirk Serrated (?) point fragment. Unit N5E4 level 4 produced two hearths with FCR (features 16 and 19) and two associated Kirk Serrated point fragments. See Table 5.2 for feature descriptions. Early work in 1990 had produced a Kirk Serrated working surface and hearth in the excavation marked A in Figure 5.19.

Artifacts associated with Kirk working surfaces include bifaces, often thin and triangular with flat bases or wide oval forms, side scrapers, edge used flakes, roughly edged cobbles, core choppers, hammerstones, pitted stones, and one occurrence of net sinkers (notched cobbles). Flakes of foreign materials are rhyolite, argillite, and silicified slate (metavolcanic/silicified sediment or tuff).

The 13 projectile points from area D are quartzite (8), rhyolite (1), silicified slate (3), and quartz (1). There were 20 points from area B, and the lithic material choice was very similar, with quartzite (14), rhyolite (4), silicified slate (1), and quartz (1). Of the 33 Kirk Serrated hafted bifaces, 9 (27.3%) are made of the volcanic and metavolcanic materials. These materials are most frequently encountered in the Piedmont south and west at distances of 75 miles or more from the site.

Working surfaces of this period are difficult to interpret in all but two cases (N1E0, level 6, and N2E0 level 4). For these two levels, which were 1.5 to 2 inches in thickness, hearth stone and flakes/shatter were of equal weight for a weight ratio of 1. Weights of FCR and flakes/shatter were each about 5 lbs. per level. Flake/shatter fragments equaled approximately 1,000 to 1,250 pieces per level and formal artifacts were 0.83 to 1.14 lbs. per level. Even when corrected for level thickness; these

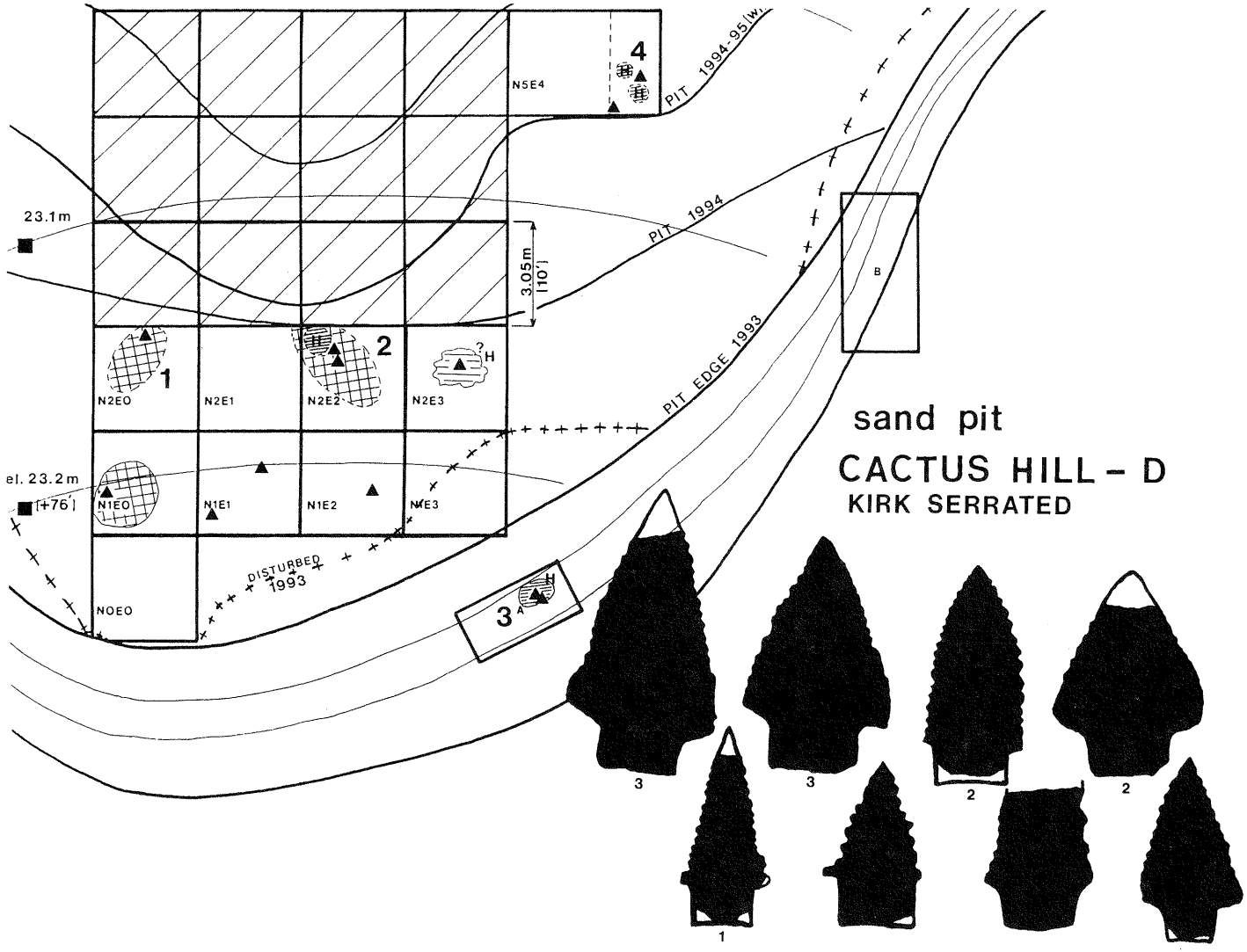


Figure 5.19. Kirk Serrated use areas, Cactus Hill area D, 1993 and 1994 (N5E4) excavations plus test units A and B. Triangle=Kirk Serrated point, H=hearth, cross checked areas=working surfaces. Silhouettes are recorded Kirk Serrated points from the use areas indexed by number to the excavation plan.

values reflect the fewer, and smaller, rock hearths associated with Kirk Serrated, compared to those of Halifax and Morrow Mountain periods. Most of the debitage associated with Kirk Serrated was bifacial core related as opposed to more bipolar core debitage associated with Morrow Mountain

In area D, Kirk Serrated use areas were small and involved small FCR hearths with associated working surfaces containing flakes and tools. Use areas appear to be no more than 10 by 10 feet (100 square feet - 9 square meters). In area B, Kirk Serrated projectile points/hafted bifaces were recognized in clusters from approximately 10 by 10 feet to 20 by 30 feet (100 to 600 square feet - 9 to 56 square meters) (Figure 5.53).

Lower Mid Levels of Area D, The Bifurcate Point Tradition - LeCroy and St. Albans (ca. 8,300 to 8,800 B. P.)

The bifurcate point tradition in area D at Cactus Hill was represented by 15 hafted bifaces which generally fall into four categories: St. Albans - 5, LeCroy - 3, straight or tapered stemmed - 2, and unshouldered - 4. There was one damaged example which could not be typed. These artifacts were randomly scattered over most of the excavation units as shown in Figure 5.20. Only the unshouldered examples (Figures 5.9 and 5.11) were associated with a possible feature, which was a few widely scattered hearth stones and a small amount of carbonized hickory nut shell in unit N2E1 in level 2. This was encountered at approximately the level of Morrow Mountain I material in adjacent unit N2E0 (level 2) (Figure 5.6). It is likely that these unshouldered bifurcated bifaces are tools unique to the Morrow Mountain I tradition and some may be resharpened asymmetrical Morrow Mountain I. projectile points. These artifacts are not considered to represent a diagnostic point type or horizon marker and will not be further evaluated.

The two straight or tapered stem bifurcate points were recovered in units N2E0 and N1E1 (Figures 5.6 and 5.10). The N2E0 example, a relatively large point, was recovered in level 2 in the north end of the square above a Kirk Serrated point in level 4. The example from N1E1 was recovered in level 3 with two fragmentary Kirk Serrated points, although it was smaller and thinner than the Kirks. These examples do not appear to represent any specific type, but are somewhat similar to Kirk Serrated, Stanly, and LeCroy. They were not associated with a feature, and their significance is unknown.

The two identifiable bifurcate forms, LeCroy and St. Albans (Broyles 1971), were recovered in a random scatter across area D at Cactus Hill with no direct association with features. LeCroy points were recovered in units N0E0, level 4; N1E2, level 2; and N2E3, level 3. St. Albans points were recovered in units N1E0, level 7; N2E0, level 6; N1E2, level 2; test excavation A at 28.5 inches below surface; and test excavation B at 26.0 inches below surface. These two point types were recovered together only in unit N1E2 (Figure 5.12), and the St. Albans example was slightly lower than the LeCroy point. The number of these artifacts and the circumstances of their recovery preclude any analysis of their relative age. On the Slade Site, a LeCroy hearth was dated at 8,300 ±110 B. P. St. Albans points have not been dated on the Nottoway River, but are assumed to date to approximately 8,600 to 8,800 B. P. or in the range reported by Broyles (1971) on the St. Albans Site. On the Cactus Hill Site, a better data base exists for the St. Albans period artifacts.

St. Albans (ca. 8,600 to 8,800 B. P.)

In area D at Cactus Hill St. Albans was recovered in the best stratigraphic context in units N1E0 and N2E0 of block E0 (Figures 5.8a and 5.6). Unit N1E0 also contained a large Fort Nottoway component, so this unit will not be used for analysis of St. Albans. St. Albans projectile points/hafted bifaces were recorded below Kirk Serrated points in units N1E0, N2E0, and test excavation A in area D. In units N1E0, N1E2, and test excavation A of area D, St. Albans points appear to occur at the same level with Fort Nottoway points.

Unit N2E0, level 6 produced only 0.4 lb. of hearth stone fragments, but it produced 11.2 lbs. of flakes and shatter in a level averaging only 1.36 inches in thickness. There were approximately 2,300 flakes and shatter fragments in this level. The weight ratio of FCR to debitage was 1:28, and it is unclear that any FCR was actually associated with the St. Albans use of this area of the site. Formal artifacts include bifaces, wide, thin, and oval in shape. Also

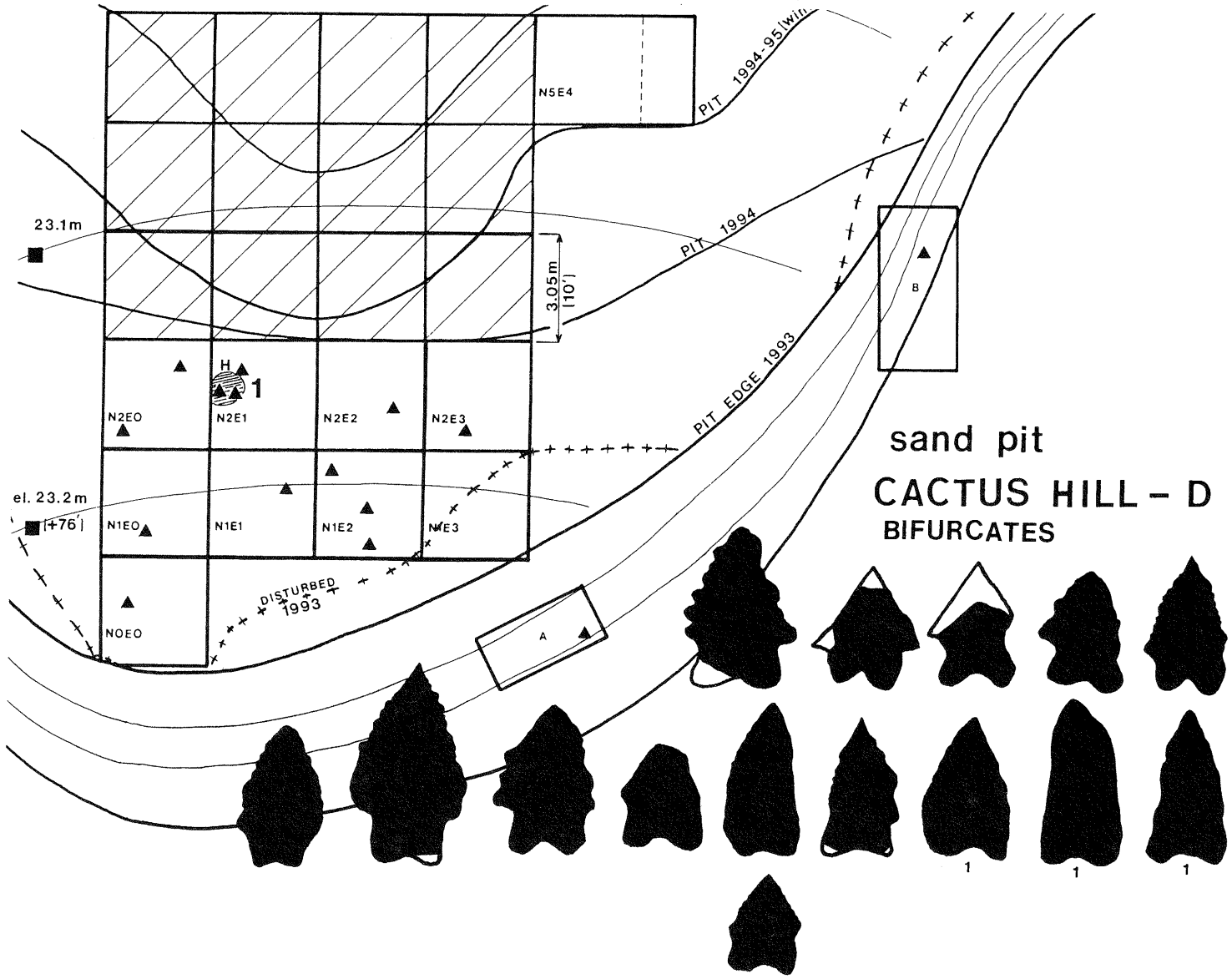


Figure 5.20. Bifurcate point distribution (and one use area), Cactus Hill area D, 1993 excavation (none recovered in 1994 excavation - N5E4), and test units A and B. Triangle=bifurcated base point, H=hearth. Silhouettes are recorded bifurcate points from the excavation units - some indexed by number to the excavation plan.

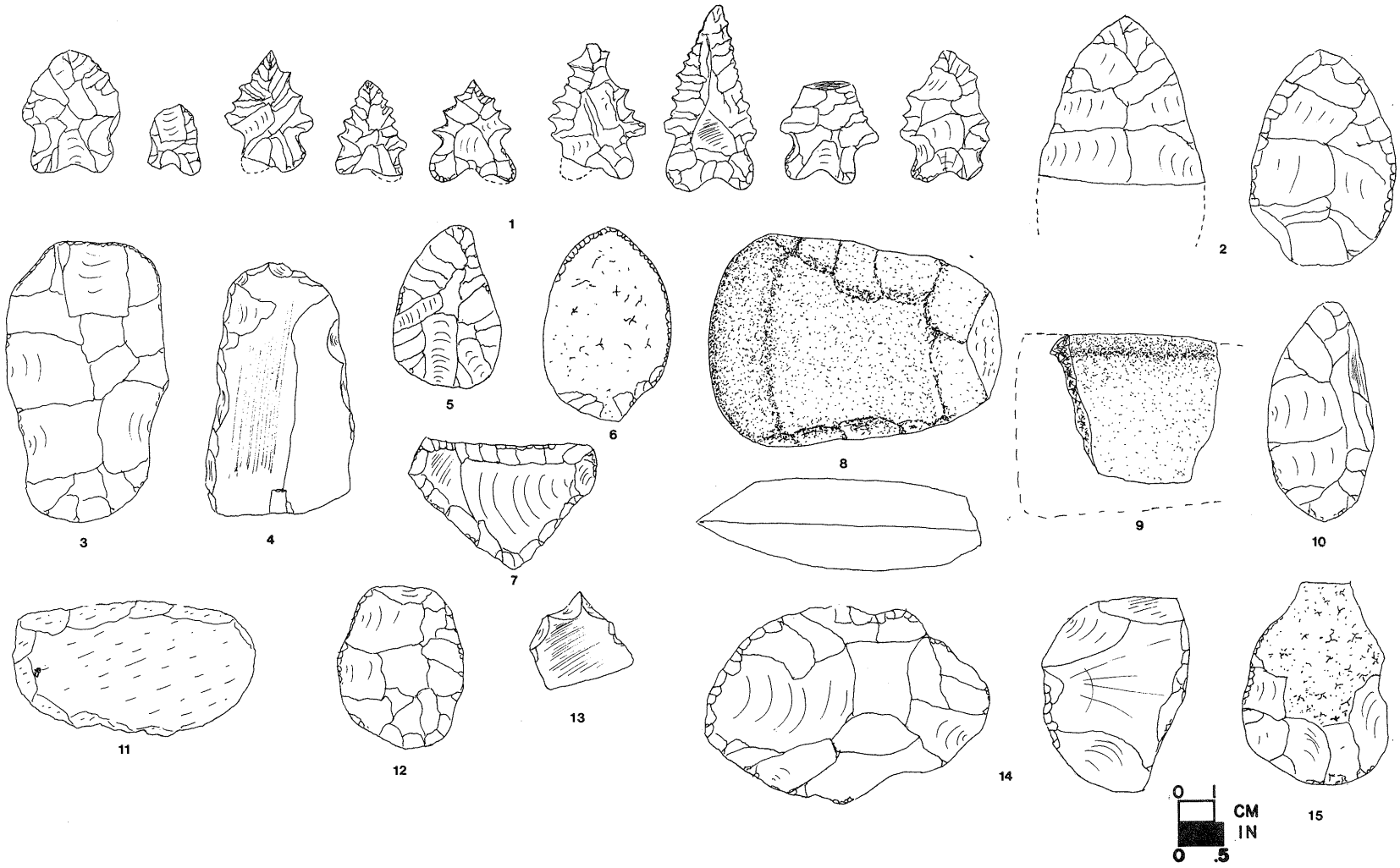


Figure 5.21. St. Albans tradition artifacts from excavations on Cactus Hill, areas D and B. 1, St. Albans points; 2, 3, 5 and 10, bifaces; 4 and 11, tabular scrapers; 6 and 15, edged flakes; 7, 12 and 14, side scrapers; 8 and 9, celt or adz and fragment; 13, snapped flake graver.

recovered were edged flakes, roughly edged flake and core fragments, hammerstones, tabular scrapers of layered schist and sandstone, and fragments of ground stone tools - probably celt or adz blades. Typical artifacts recovered at Cactus Hill associated with the St. Albans tradition use of this site are shown in Figure 5.21. Flakes of foreign stone materials include various types of rhyolite, silicified slate, unidentified metavolcanics, and small amounts of chert, jasper, chalcedony, and mountain flint. There was an emphasis on the use of high grade metavolcanics, which shows up in the Cactus Hill deposits as small biface reduction flakes and trim flakes. New tools were being made of locally available quartzite, and only the associated quarry activity areas could be identified in area D at Cactus Hill. Much of the debitage was bifacial with less emphasis on the bipolar reduction of small quartz cobbles observed with LeCroy.

While no site use area estimates could be made in area D of the site, more information was obtained from the distribution of St. Albans age material on the ridge at area B (Figure 5.54). In area B, four areas were identified as clusters of St. Albans material. The recognized use areas, as shown in Figure 5.54 by number, produced 3 points (area 1), 5 points (area 2), 2 points (area 3) and 2 points (area 4). These artifacts and isolated finds are presented by stone material in Appendix A. Thirteen of 18 were metavolcanic materials.

Use areas were estimated to be within the size range of 10 by 10 feet to 25 by 25 feet (100 to 625 square feet - 9 to 58 square meters). These areas were on the ridge centerline to slightly north of the centerline. In one case, area 1 of Figure 5.54, the information was provided to NRS by others working on the site. Most of the St. Albans use areas in area B were flake clusters, but hearth features were noted in squares 1/11 and 0/22 (test excavation V, 1992). The hearth areas were open without FCR, but burned quartzite flakes and core fragments were present. The hearth in 1/11 produced a large tabular schist scraper, and the hearth in 0/22 also was associated (?) with six Fort Nottoway points - probably overlapping in age with St. Albans. In general, the St. Albans use of Cactus Hill appears to have been by small groups and over small areas of 10 to 50 square meters. Discarded projectile points are frequently of high quality metavolcanic material such as translucent green silicified rhyolite of fine structure and silicified slate or tuff. These materials are most common at distances of 75 or more miles to the southwest of Cactus Hill.

LeCroy (ca. 8,300 B. P.)

Only three LeCroy points were recovered from area D at Cactus Hill, and 9 points were recovered from area B. Ten of the 12 points were made from white quartz and two from green silicified slate (silicified sediment or tuff). There were no excavation units where LeCroy age materials could be recognized clearly and isolated. The best candidate was square N0E0, levels 3 and 4, but many levels in this unit were thought to be intermixed. Levels 3 and 4 were together 6.56 inches thick and produced 49 lbs. of lithics of which only 8.5 lbs. was FCR. Flakes and shatter weighed approximately 22 lbs., for a hearth stone to debitage ratio of 1:2.6. The most distinguishing feature of the two levels was the quantity of quartz bipolar cores (4.4 lbs.) and quartz flakes and shatter (2 lbs.). Formal artifacts were thin quartz bifaces, thick wide quartzite bifaces, edged flakes and core fragments, hammers and anvils, manos, fractured cobbles with edges used as planes, abrading stones, and small quartz wedges. This inventory was very similar to that recorded 3 miles upriver on the Slade Site with a large LeCroy hearth/working surface and three LeCroy projectile points. The size of LeCroy use areas could not be estimated in area D.

In area B, most of the LeCroy projectile points were individual finds, but two small flake clusters and 1 core cluster were recognized as areas 1a (square 0/8w) and 2a (square 2/16) of Figure 5.54. The clusters which were on the ridge centerline were no larger than 10 by 10 feet and certainly represent small use areas compared to the areas utilized by other groups.

Several LeCroy features have been observed in the sand pit walls since 1989 in area B and area D. One feature which was investigated was a pit hearth with FCR which was observed in area D near area C. The pit was approximately 10 inches (25.4 cm) deep and 21 inches (53 cm) long. Three LeCroy points of quartz, 5 FCR fragments, hickory nut shell, and calcined bone (including a snake vertebra) were recovered in this partly destroyed feature.

In area B, a "hearth" and associated working surface was observed in the pit wall. Investigation

revealed a LeCroy point of green silicified slate, a mano, a sandstone cobble with pits in the surface (nutting stone), numerous flakes, bipolar quartz cores and a surface hearth (?) with eight thermally fractured round cobbles. There was no carbonized material or calcined bone, and the "hearth" may have been a collection of boiling stones deposited on the working surface. This feature had been partially destroyed and meaningful dimensions could not be obtained.

LeCroy features on Cactus Hill are not common and appear to be widely distributed across the site. Most LeCroy use areas are associated with carbonized hickory nut shell, and hammerstones, manos, anvil stones, and bipolar quartz cobble cores. Twelve LeCroy points were recovered in excavations, and approximately the same number have been recovered from features and flake clusters exposed over a wide area in the sand pit walls. The most frequent foreign material associated with LeCroy is green silicified slate (silicified sediment or tuff) which is of unknown origin, but most commonly observed near the Virginia-North Carolina border 70 miles to the southwest. Most of the diagnostic LeCroy artifacts are made of local white quartz.

Upper Region of the Lower Levels of Area D - Fort Nottoway Tradition (ca. 8,900 B. P.)

The Fort Nottoway tradition (Egloff and McAvoy 1990; McAvoy 1988) at area D of Cactus Hill was represented by 15 complete and fragmentary projectile points/hafted notched bifaces. Three of these points were found to have cross-mends (fragments), and were counted only once in the total. Recognition and dating of the Fort Nottoway side-notched point tradition is considered one of the major accomplishments of the survey work on the Nottoway River sites - primarily the work at Slade and Cactus Hill. The 15 Fort Nottoway points from area D at Cactus Hill by stone material were: 12 quartzite, 1 coarse blue rhyolite, 1 yellow weathered chert or rhyolite, and 1 white quartz. The three points not of quartzite were resharpened remnants or fragmentary. The blue rhyolite example had been resharpened to reject stage and utilized as a drill, broken and was recovered in two fragments thirty feet apart. Area B of the site produced 32 examples of this point type. All were quartzite except 1 small point of jasper. A detailed description of the Fort Nottoway point and starting biface form is given in Appendix A.

Fort Nottoway projectile points were recovered in block E0, unit N0E0 (level 5), unit N1E0 (levels 7-8), and unit N2E0 (level 2 disturbed); block E1, unit N1E1 (level 6) and unit N2E1 (levels 6-7); block E2, unit N1E2 (level 3) and unit N2E2 (level 6); block E3, unit N2E3 (level 6); block E4, unit N5E4 (level 7 upper area); and test excavation A at 28.5 inches below surface. Features of Fort Nottoway age (Figure 5.22) were: a large flake and tool cluster and surface hearth in unit N1E0, levels 7 and 8 (N1E0-7/8-F1); a large flake and tool cluster in unit N1E1, level 6 (N1E1-6-F1); a large pit hearth in unit N2E1, level 6-9 (N2E1-6/9-F1) and an associated pit filled with flakes (N2E1-6/9-F2); a basin filled with flakes and tools in unit N1E2, level 3 (N1E2-3-F1); and a large flake and tool cluster in unit N2E3, level 6 (N2E3-6-F1). These features are more completely described in Table 5.2. Other working surfaces including a small flake and tool cluster were found in unit N0E0, level 5; unit N5E4, level 6-7 (south); and test excavation A at 28 inches below surface.

The features include pits and shallow basins filled with flaking debitage and surface and pit hearths with associated tool and flake clusters. Area D at Cactus Hill was clearly part of a large interactive residential area with space utilized in such a nature as to indicate the presence of structures. The deep pit in unit N2E1 was filled with flaking debris from no more than four or five cores (refitted example, Figure 5.23), and the feature was adjacent to a deep pit hearth which produced two 14C dates on carbonized wood spanning 8,680 to 8,985 B. P. at one sigma. The hearth contained two refitted fragments of a Fort Nottoway point. The working surfaces in units N1E0 and N1E2 were littered with large broken in-process Fort Nottoway bifaces intended for use as knives or projectile points. Many were thin and broken near completion, then dropped together as broken fragments. A number of these were refitted as shown by the example from N1E2 in Figure 5.12.

Because of the number and completeness of the Fort Nottoway working surfaces, a very detailed inventory of tools was compiled. The Fort Nottoway

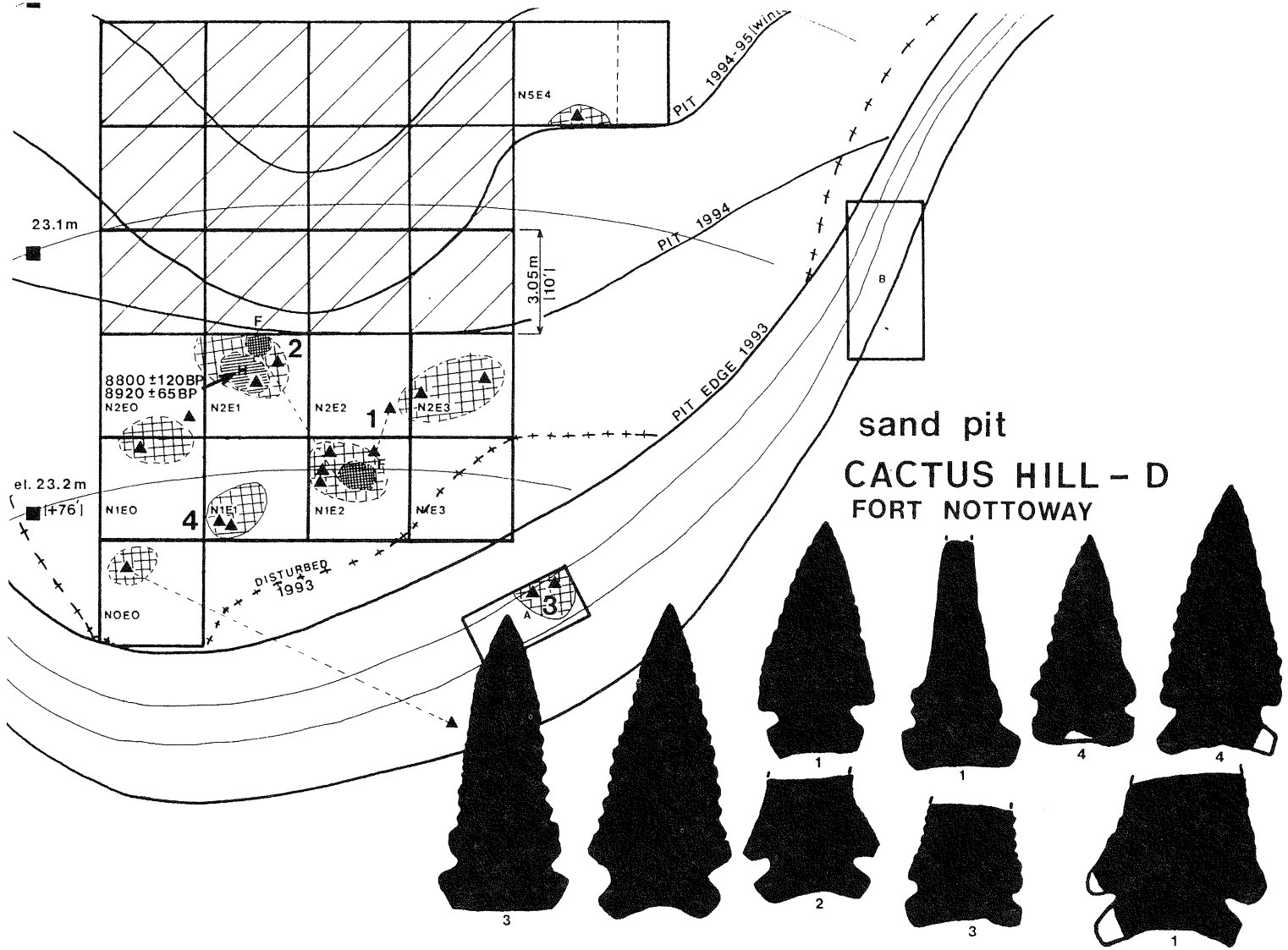


Figure 5.22. Fort Nottoway use areas, Cactus Hill area D, 1993 and 1994 (N5E4) excavations. Triangle=Fort Nottoway point, H=hearth, F=feature (flake and tools clusters, pit), Cross checked areas=working surfaces. Silhouettes are recovered Fort Nottoway points from the use areas indexed by number to the excavation plan. Dashed lines connecting triangles (points) are cross-mends.

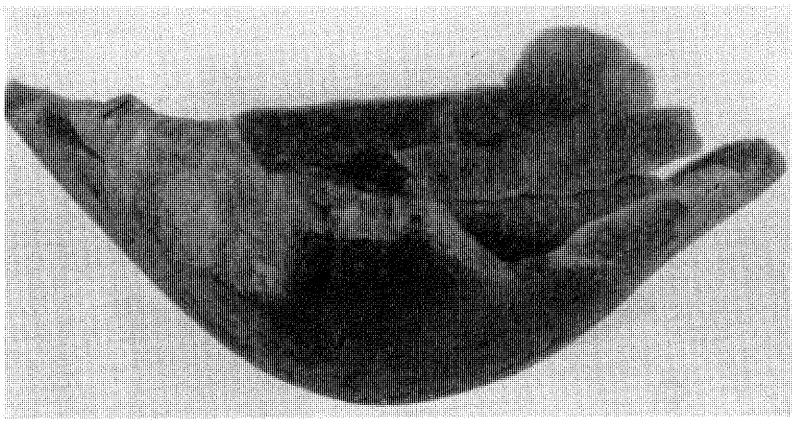


Figure 5.23a. Refitted Fort Nottoway tradition cobble core, side view, from area D unit N2E1, pit feature (N2E1-6/9-F2) adjacent to hearth. Blade-like flake core.

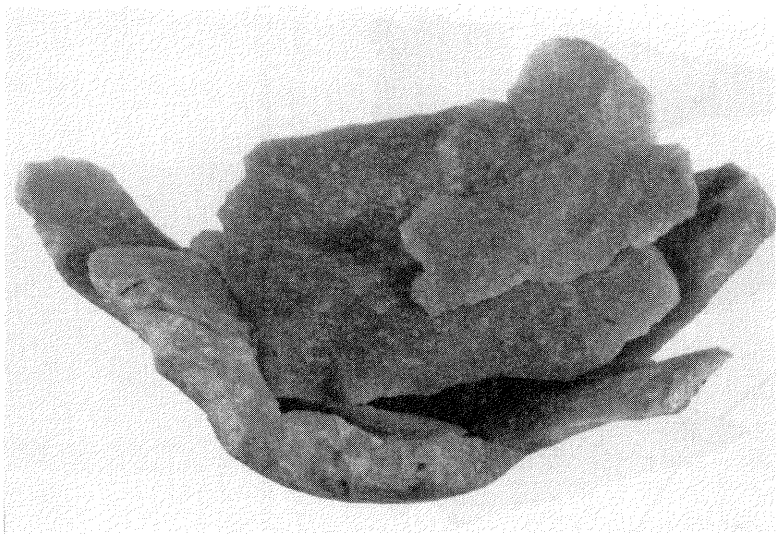


Figure 5.23b. Refitted cobble core from Figure 5.23a, intermediate view edge - top.

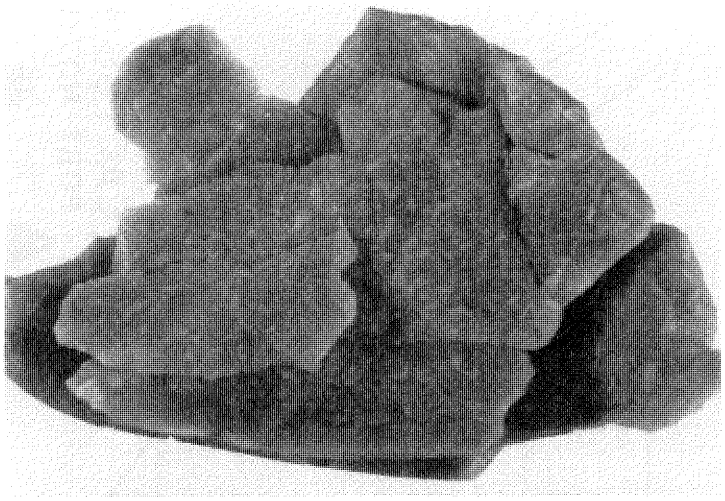


Figure 5.23c. Refitted cobble core from Figure 5.23a, top view (from left).

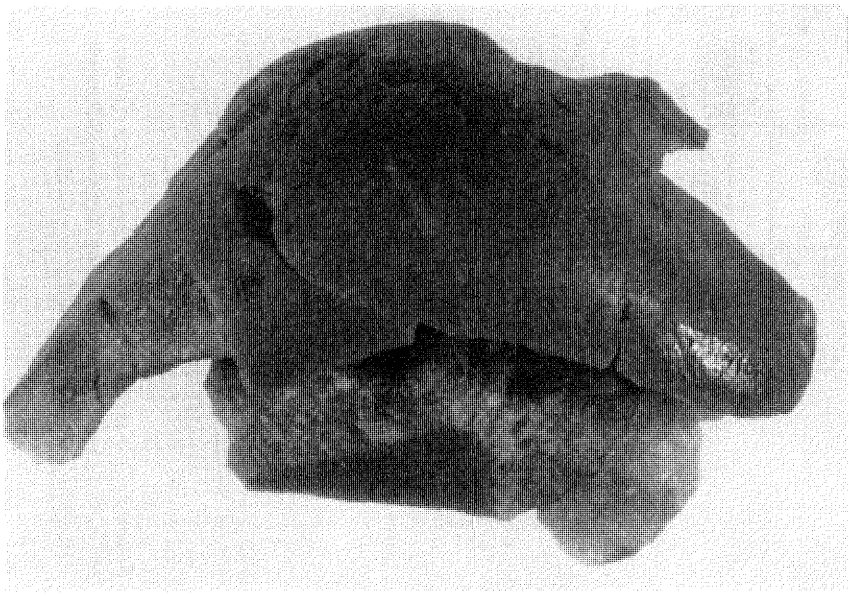


Figure 5.23d. Refitted cobble core from Figure 5.23a, bottom view (from left).

tool inventory was created primarily from fine grain glassy blue, brown, and gray quartzites and includes: projectile points and reworked points used as drills; large pentagonal, triangular or heart shaped bifaces - some resharpened with beveled edges and serrations; large unifacial side scrapers and knives made upon irregular flakes and blade-like flakes struck from cobble cores; end scrapers some quite large with elongated haft elements; wedges; numerous edge worked and edge used flakes, many blade-like; flaked adz and celt blades with no grinding or polishing of the cutting bit; small chisel or adz blades pecked into edge shapes suitable for sockets or handles; large, heavy, thick bifaces used as choppers and abrading surfaces; fractured cobbles used as abrading surfaces; tabular schist scrapers - rectangular in shape (note that these are common as well to St. Albans); numerous small thick bifaces used as cutters or scrapers; ground pieces of paint stone (iron oxide - ore - burned red); hammerstones; and tabular slabs of quartzite or sandstone used as grinding or abrading surfaces. Denticulate and graver-like tools, often quite heavy, are also found with these other tools. Typical artifacts recovered at Cactus Hill associated with the Fort Nottoway tradition use of this site are shown as Figures 5.8b, 5.13b, 5.24, and 5.25

Fort Nottoway working/living use areas in area D at Cactus Hill are difficult to isolate. Clearly, almost anywhere one excavates in area D Fort Nottoway age material is recovered. Refit fragments of artifacts were found over a distance of 20 to 30 feet in an east-west and north-south orientation. Because local quartzites of a narrow color range were used for most tools, there is little uniqueness among the lithics to help with identification of individual clusters. Some locations within area D do appear to have a hearth central to several tool clusters adjacent to the hearth. Area B provides additional data concerning cluster size. Six cluster areas were recognized in area B as shown in Figure 5.56. These areas produced projectile points, tools, flakes, and features similar to those observed in area D except artifacts in the area B clusters were heavily concentrated. At least two area B clusters (5 and 6) were centered around hearth areas and contained six or more Fort Nottoway projectile points/hafted notched bifaces, other tools, and in-process bifaces. It appears that clusters 3, 4, 5, and 6 were related. The areas around the clusters excavated by NRS, plus information on an adjacent area received from one other individual with a permit to excavate, reveals at least 25 Fort Nottoway projectile points in an area approximately 45 by 50 feet (2,250 square feet - 209 square meters). Generally, the central hearth features and surrounding high density of artifacts could be contained individually in areas as small as 15 by 15 feet (225 square feet - 21 square meters).

It appears that multiple working surfaces and tool clusters surrounding hearths were present on the ridge at area B, on the north slope to the river at area D, and on the hill top area removed for sand prior to 1989. A cluster at location 1 of Figure 5.56 was clearly a remnant area associated with the hill top region of the site. No other cultural tradition, with the exception of Morrow Mountain II, made as heavy use of all of the Cactus Hill Site as did Fort Nottoway.

For an analysis of debitage and lithic materials on Fort Nottoway working surfaces (presented in the debitage tables) units N1E0 level 8, N1E2 level 3, and N2E3 level 6 were selected as showing the least disturbance. The average thickness of the levels was 3.4 inches (8.6 cm), and the average weight of fire cracked rock was 2.3 lbs., with flakes weighing on average 15.7 lbs. The ratio of fire cracked rock to flakes is 1 to 6.8. The average number of flakes per level is 3,481. Formal artifacts, on average, weigh 4.33 lbs. Since Fort Nottoway hearth areas do not incorporate stone, the fire cracked rock in these levels probably reflects accidental incorporation into surface hearths or downdrift from bifurcate (LeCroy) or later levels. Flakes and formal artifact weights are relatively high even after compensating for above average level thickness.

The most common non-local lithic materials recovered as flakes on Fort Nottoway working surfaces are cherts and fine grain metavolcanics. There is a high percentage of bifacial reduction flakes on working surfaces and a very low percentage of bipolar reduction debitage. Most cores are cobble blade-like flake cores (Figure 5.23) which merge into bifacial core forms. Large, thin, well flaked bifaces were a trait of the Fort Nottoway tradition. The wide, thin flake debitage resulting from the manufacture of these bifaces, shows ground striking platforms and is blade-like and quite distinctive.

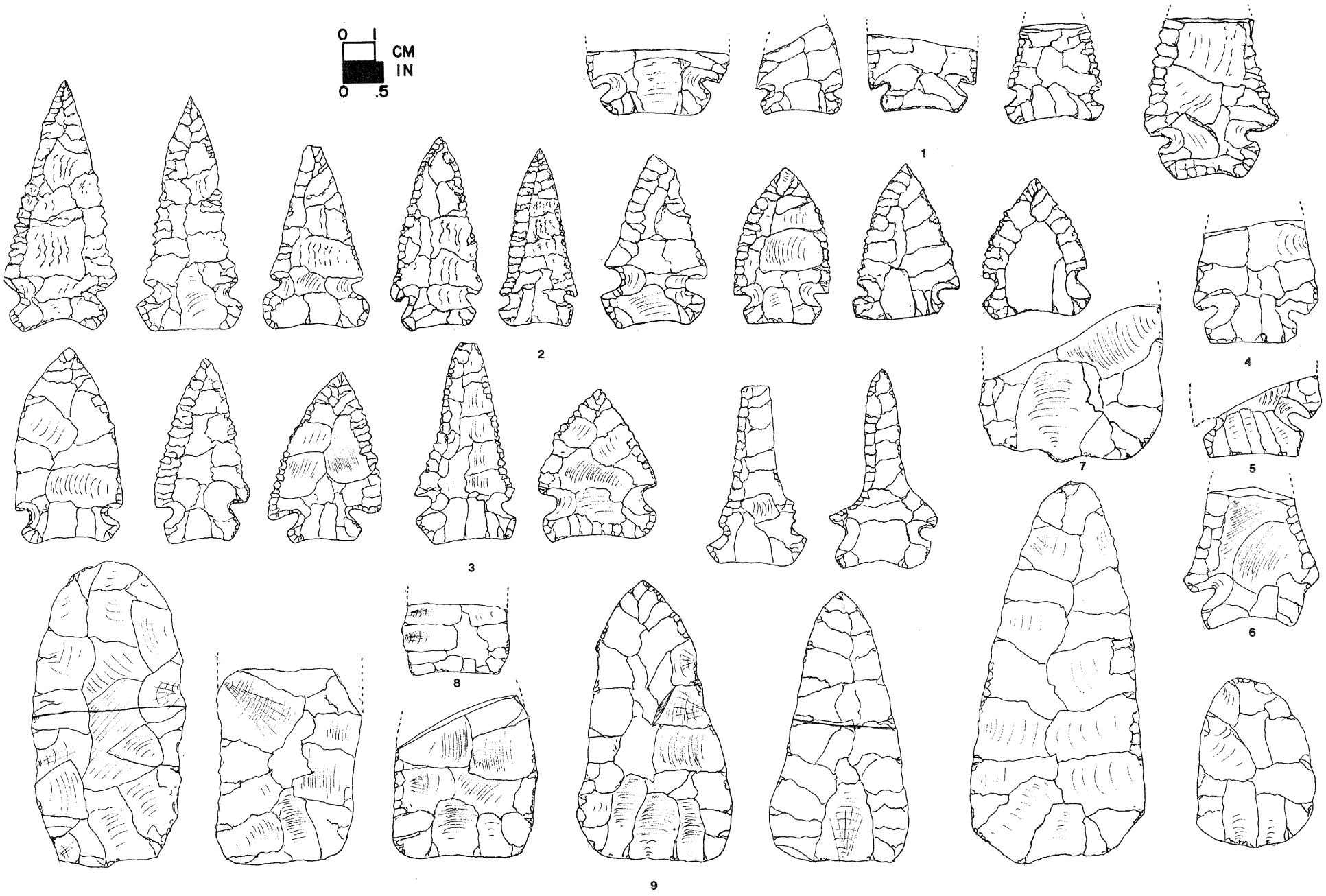


Figure 5.24. Fort Nottoway side-notched point tradition artifacts form excavations on Cactus Hill, areas D and B. 1,2, and 3, Fort Nottoway projectile points/hafted bifaces, and drills; 4, 5, and 6, Fort Nottoway points broken near completion; 7, 8, and 9, Fort Nottoway point preforms and thin bifaces/hafted knives.

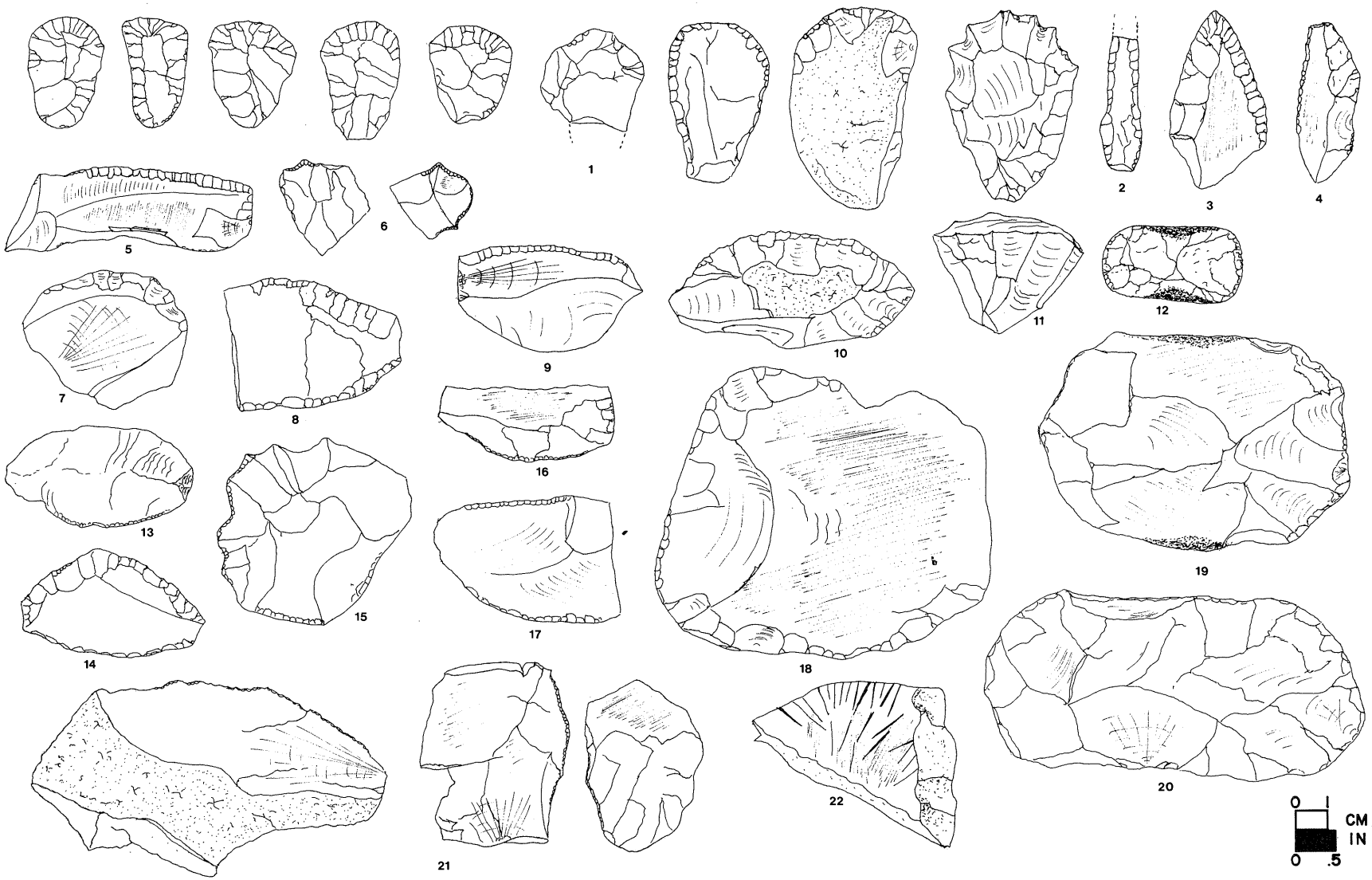


Figure 5.25. Fort Nottoway side-notched point tradition artifacts from excavations on Cactus Hill, areas D and B. 1, end scrapers; 2, drill tip - unnotched; 3, pointed unifacial tool; 4, narrow side scraper; 5, 9, 13, 16, and 17, unifacial edged flakes - flake knives; 6, snapped flake and edge worked gravers; 7, 8, 10, 14, and 15, side scrapers; 11, blade core - roughly polyhedral; 12, adz blade; 18, flake chopper/abrader; 19 and 20, flaked celts or axes; 21, edge used flakes; 22, abrading stone - heavily used.

In approximately the same levels with Fort Nottoway artifacts are found a few other projectile point/hafted biface forms which conform with early types identified by other researchers. Unit N0E0 level 5 produced the base of a large corner notched Kirk-like point of quartzite. Unit N2E2, level 5, produced two projectile points, one of quartzite and one of quartz (Figure 5.11a and Figure 5.11b), which were found together and conform to the general Kirk Stemmed (Coe 1964) or Kirk Side-Notched types. It could be argued that these artifacts represent greatly resharpened Kirk Corner-Notched points. Tools (Figure 5.11B) found in the level with these points are similar to those associated with Fort Nottoway points, and the time period of use of these artifacts is probably around 8,700 to 8,900 B. P. An inventory of tools associated with Kirk Stemmed/Side Notched points is presented in Table 5.22. The apparent use area for this point type in area D is quite small, perhaps 10 feet by 10 feet and is shown in Figure 5.26 for level 5, unit N2E2.

A single projectile point recovered in unit N1E2 at the level of a St. Albans point appears more similar to the large Kirk Corner-Notched type (Broyles 1971) than to the Fort Nottoway points recovered just below it. A scatter of deeply corner notched forms, with ground basal margins, much like large Palmer points (Coe 1964) also occurs in area D at Cactus Hill but below Fort Nottoway points. These artifacts are described further in this section, and appear to be significantly older than Fort Nottoway. All of these point types described here are similar in appearance of the basal region, and resharpened examples may overlap in appearance. This presents additional problems in typology when dealing with the microstratigraphy of shallow sites.

Middle Region of the Lower Levels of Area D - Decatur Tradition (ca. 9,100 B. P.)

The Decatur or Decatur-Angelico tradition (Egloff and McAvoy 1990) was represented in area D at Cactus Hill by 19 projectile points/hafted bifaces. Only nine were recovered in area B of the site. The 19 examples from area D were: quartzite - 16, oolitic quartzite - 1, and highly silicified black rhyolite or tuff - 2. By contrast, the area B examples were: quartzite - 4, rhyolite (green and black) - 2, silicified slate (silicified sediment or tuff) - 2, and fossiliferous gray chert - 1. Area D examples were 84.2% quartzite, while area B examples were only 44.4% quartzite. An unnotched, concave base, triangular bifacial knife also was associated with the projectile points as was a wide blade, concave base notched form which also may have functioned as a knife. Decatur points are described in Appendix A.

Decatur points were recovered in block E1, unit N1E1 (levels 5-7) and unit N2E1 (level 7); block E2, unit N2E2 (level 5-6); block E3, unit N2E3 (levels 7-8); block E4, unit N5E4 (level 7); and test excavation A at 30 inches below surface. Working surfaces were encountered in units N1E1 (levels 6-7), N2E2/N2E3, N5E4 (level 7), and test excavation A at 30 inches below surface as shown in Figure 5.27.

Only one hearth producing carbonized wood suitable for 14C dating was encountered, and this was in unit N5E4 level 7, feature 22 (Table 5.2). Two radiocarbon dates were obtained from the feature which averaged 9,100 to 9,200 B. P. and are described in more detail in Chapter 6.

Decatur period use of the Cactus Hill Site in area D was marked by small working and living surfaces which appear to be no more than 20 by 20 feet (400 square feet - 37 square meters). These use areas are marked by expended projectile points and bifacial knives as well as numerous discarded/broken projectile point preforms and tools. Many of the tools were heavy, roughly edged, expedient items. Working surfaces produced very few delicate end scrapers and finely made unifacial tools.

Area B produced two Decatur working surfaces in square 4/11 level 6, and salvage excavation A level 4, on the southwest slope. These areas, which will be discussed in more detail in the section on area B, were difficult to evaluate but appear to have been relatively small and no more than 15 by 15 feet (225 square feet - 21 square meters). Both of these areas produced three Decatur points/notched hafted bifaces and numerous large roughly edged tools with few delicate small tools. In contrast to the working/living surfaces encountered with the slightly later Fort Nottoway tradition, Decatur age use areas are smaller, produce tools in less numbers and variety, and produce fewer features which appear related to structures or long term residential site use. The very extensive use of the Slade Site, three miles upriver, in the Fort Nottoway time period led to confusion in past work as to the relative age of the Decatur and

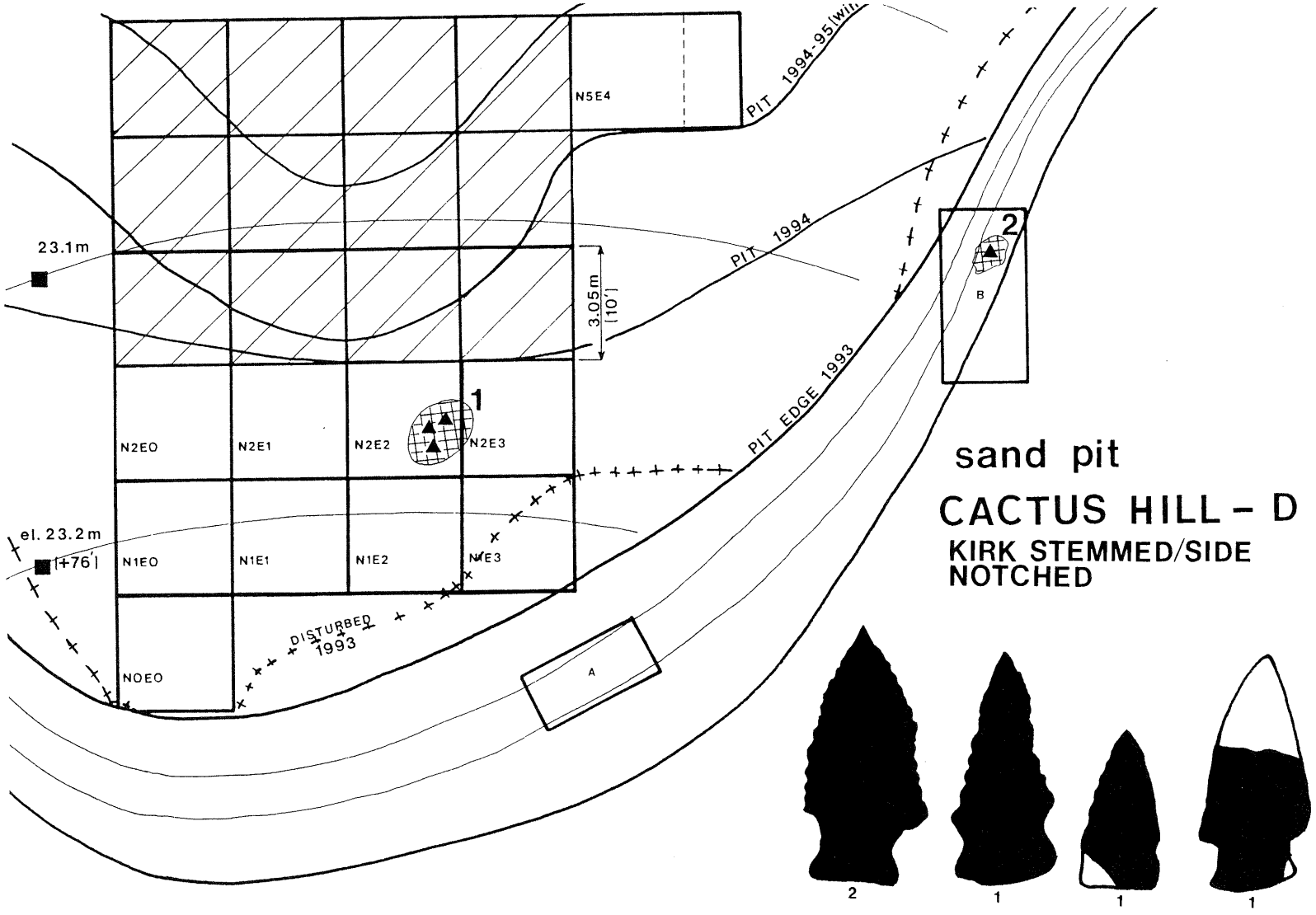


Figure 5.26. Kirk Stemmed/Side-Notched use areas, Cactus Hill area D, 1993 and test excavations (none recovered in 1994 (N5E4) excavation). Triangle=Kirk Stemmed/Side-Notched point, Cross checked areas=working surfaces. Silhouettes are recovered points from the use areas indexed by number to the excavation plan.

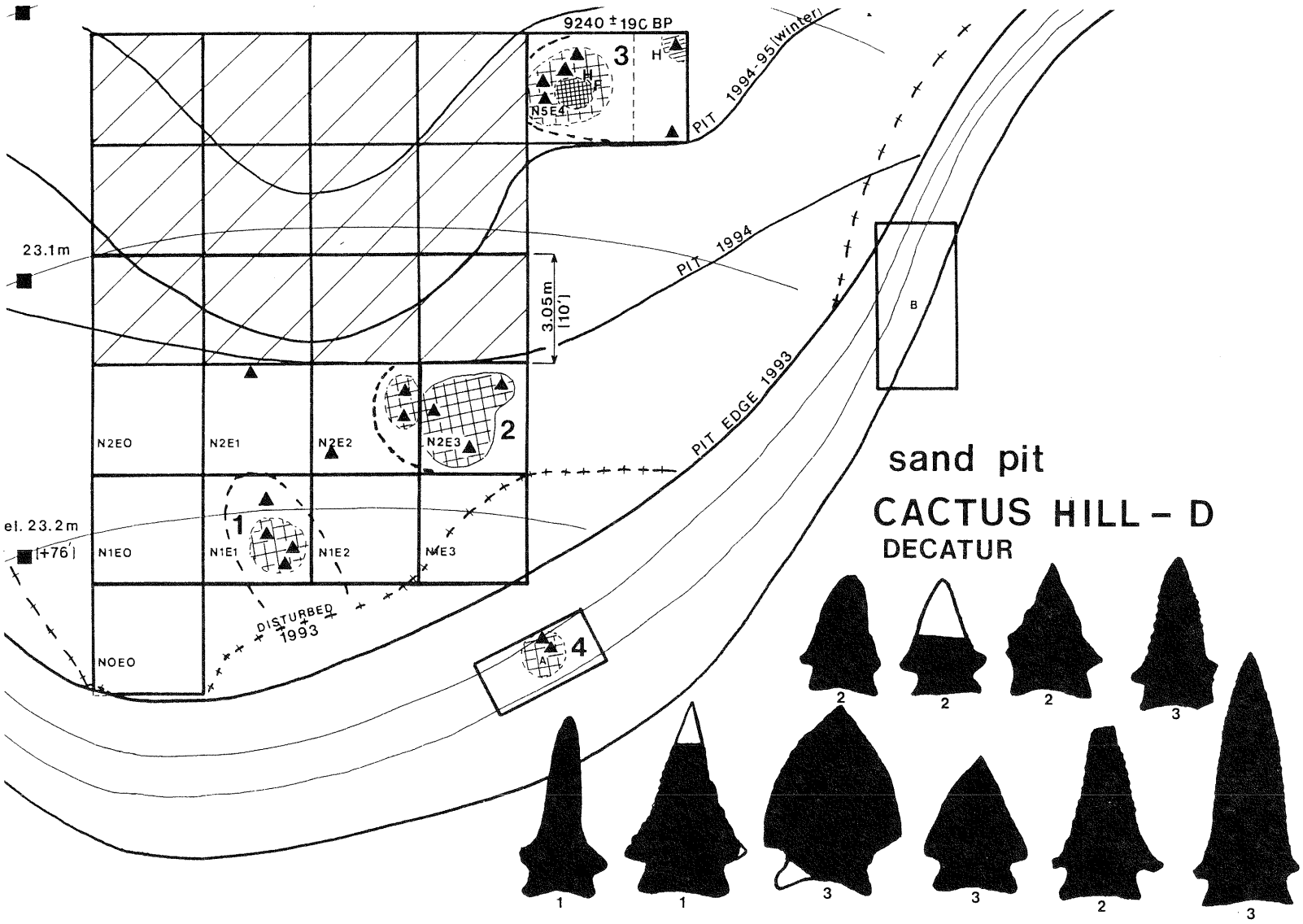


Figure 5.27. Decatur use areas, Cactus Hill area D, 1993 and 1994 (N5E4) excavations plus test units A and B. Triangle=Decatur point, H=hearth, cross checked areas=working surfaces. Silhouettes are recorded Decatur points from use areas indexed by number to the excavation plan.

Fort Nottoway traditions. Downdrift of Fort Nottoway artifacts in areas of overlapping site use produced the appearance on the Slade Site that Fort Nottoway points occurred below Decatur points (Egloff and McAvoy 1990; McAvoy 1988). This is a problem with the microstratigraphy of the eolian sand sites, and argues strongly for excavation of large areas of these sites, and/or for 14C dating of features to determine actual or even relative age. Stratigraphic position of diagnostic artifacts of traditions separated by only a few hundred years (and a few inches of sand) is of value only where large areas of these sites are sampled and/or where good features exist to aid in relative and actual dating.

The specific tool types encountered on Decatur working/living surfaces, as determined from five locations in area D and area B, include: Decatur projectile points; notched concave base knives; concave base triangular/lanceolate knives; large numbers of projectile point preforms - very thin and triangular to lanceolate shaped; end scrapers - some small and delicately made but others larger and roughly edged; edge worked flakes; edge used flakes; side scrapers; roughly edged cobble fragments; cobble choppers; large edged flakes; small thick bifaces; thin and wide triangular bifaces; wedges; bipolarized quartzite and quartz objects; cobble hammerstones; abrading surfaces; and paint stone (iron oxide - ore - burned red). The large and roughly edged items, the small thin projectile point preforms broken in manufacture, and edge used flakes are the most common items. Typical artifacts recovered at Cactus Hill associated with the Decatur tradition use of this site are shown as Figure 5.28. Flakes of foreign materials most frequently encountered on Decatur age surfaces are dark black silicified rhyolite or tuff, yellow weathered rhyolite, green silicified slate, jasper, crystal quartz, chert, and mountain-like black or gray flint. The most numerous are the rhyolites. These stone materials of very high quality reflect a familiarity with lithic sources 70 to 100 miles or more from the Cactus Hill Site area.

An analysis of three Decatur surfaces in area D revealed that the average thickness of the excavated levels was 2.8 inches and the average weight of flakes/shatter across a 10 foot square was 5.6 lbs.; however, FCR averaged only 0.04 lb. and was insignificant. Formal artifacts represented on average 1.5 lbs., and were a significant percentage of the overall weight of cultural lithics. The number of flakes and shatter was on average 1,700 per level. Quartz flakes and shatter were 8.9% of the total flake/shatter numbers, but only about 5% by weight. The basin hearth feature in unit N5E4 level 7 produced many flakes of black and yellow (weathered) rhyolite. The black rhyolite flakes matched the two fragmentary rhyolite Decatur points recovered in this unit, which established a direct link between the feature, the working surface containing six Decatur points, and the two rhyolite point fragments.

Lithic technology of the Decatur tradition was both bifacial and bipolar, with more use noted of bifacial techniques. Still some fairly large cobbles and tool fragments of quartzite were reduced by bipolar techniques. The large, wide, and thin/blade-like flakes common on Fort Nottoway age working surfaces are seen less frequently on Decatur surfaces. In general, the Decatur tradition was noted for the use of quartzite and metavolcanic lithics of very high quality, and while some Decatur points slightly resemble the quartzite and chert Palmer points, this lithic preference separates the two traditions.

In level 7 of unit N2E1 a rhyolite Plevna-like point (Figures 5.9 and 5.18) was recovered near a Decatur point in the south end of the square. Only two Plevna-like points have been found at Cactus Hill by NRS, and the second example, of quartzite, also was recovered in area D, but eroding from the edge of the sand pit. These points are rare on the Nottoway River, and only one other example has been excavated - this example on the Slade Site in area 7C2 in a similar context. No other association has been observed between the two artifact types.

The Lowest Cultural Levels in Area D - The Early Corner Notched Traditions (ca. 8,900 to 10,000 B. P.)

The few diagnostic artifacts encountered below Decatur age material in area D on Cactus Hill are distinctive corner-notched projectile points/hafted bifaces. These corner-notched points generally fall into a larger and a smaller point (size) category. The larger points are described as Kirks (Appendix A type 30), or the slightly different large deep notched Palmers (type 32). The latter normally have heavily

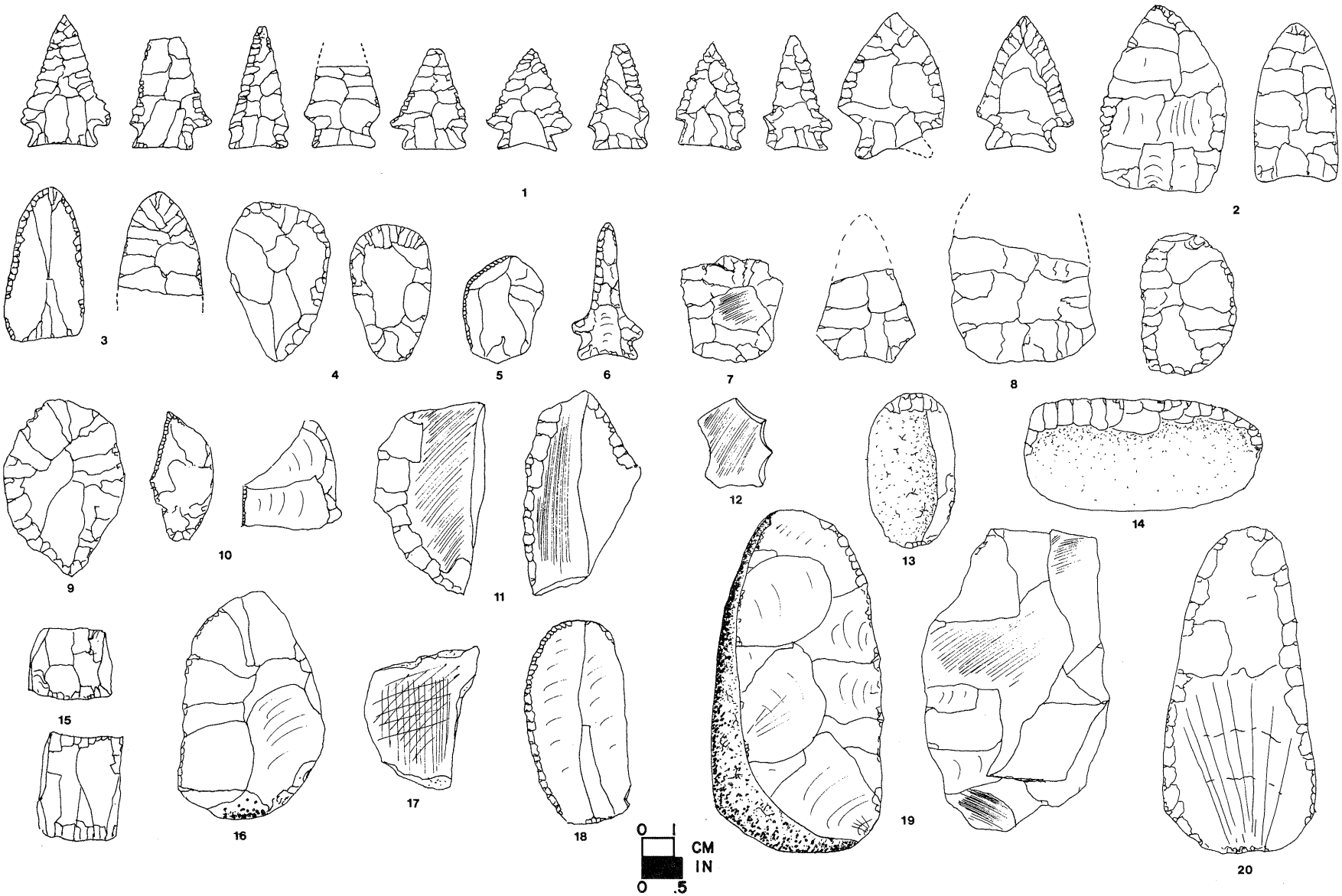


Figure 5.28. Decatur tradition artifacts from excavations on Cactus Hill, areas D and B. 1, Decatur points and hafted notched knives; 2 and 3, Decatur hafted unnotched bifacial knives; 4, end scrapers; 5, 10 and 18, edge worked flake knives; 6, Decatur drill; 7, 16, 19, and 20, worked cores/fragments - choppers; 8, bifaces; 9, 11, and 14, side scrapers; 12, snapped flake graver; 13, chisel; 15, wedges; 17, paint stone - ground/abraded.

ground basal edges and deep, narrow ground notches, while the former (Kirks) may have either lightly ground or heavily ground basal edges and fairly wide notches. Only the points with heavily ground bases have been excavated below Decatur.

The small points are defined as flat base or convex base Palmers (type 31a and 31b respectively of Appendix A), and both types usually are heavily ground along the basal edges and in notches. Some of the Palmer points overlap the Decatur type in size and shape, but the two types (Palmer and Decatur) are not excavated together on the same surfaces nor are they recovered in the same features. The small Palmer points are recovered in or below Decatur levels in area D. Excavation units where the earlier corner-notched points have been recovered below Decatur are N1E1 level 8 (Figure 5.10), and N5E4 level 8. The Decatur point type was recovered below the Fort Nottoway point type and some Corner-Notched Kirks, and below Side-Notched and Stemmed Kirks.

The eight Palmer points recovered in area D were manufactured of local quartzites (3), and Fall Line cherts (2), as well as jasper (2), and quartz (1). The 24 Palmer points recovered in area B were manufactured of quartzite (17), Fall Line chert (4), jasper and chert (1), silicified slate (tuff?) (1), and silicified rhyolite (1). There also were 15 Corner-Notched Kirks in area B, and approximately 50% of these had some grinding or abrasion along basal margins and in notches. These were fairly large points with wide notches as shown in Figure 5.29. Lithic materials were quartzite (7), metavolcanic materials (slates and rhyolite) (6), chert (1), and quartz (1).

The Deep-Notched Palmers were recovered in low numbers in area D. Two of 7 "large Palmers" or early Kirks were classified as Deep-Notched in area D, and area B produced 3. An early test excavation in area A also produced one example. The area A and area D examples were fine grain quartzite, while the area B examples were made of jasper (1), silicified slate (1), and silicified rhyolite (1). Generally, the Corner-Notched Palmer types were made of the better grades of local quartzites and Fall Line chert, but the Kirk types were often made of materials foreign to the site area and more common 75 miles or more to the southwest.

Use areas of traditions using the smaller, early corner notched bifaces were few and small in area D of the site, and all were encompassed in areas of 15 feet by 10 feet (150 square feet - 13.9 square meters). This is shown in Figure 5.30. For the larger points, the use areas were even smaller in area D (see Figure 5.31). In area B, use areas were larger for Palmer and Kirk Corner-Notched and ranged from 10 feet by 10 feet to more typically 20 feet by 20 feet and in one case possibly 30 feet by 30 feet. This is shown in Figures 5.55 and 5.60. Hearths on these working surfaces were open without hearth stones, and no other features such as pits or heavy flake concentrations were observed. The largest single Palmer working surface remaining intact in area B, was in the block made up of units 1/9 plus 2/9 and 1/11 plus 2/11 (see Figure 5.38). This surface produced eight projectile points and numerous end scrapers, side scrapers, snapped flake gravers, broken projectile point preforms, bifaces, wedges, edged flakes, used flakes, and smoothing (abrading) stones. Typical artifacts recovered at Cactus Hill associated with the Palmer and Large (Deep Notched) Palmer use of this site are shown as Figure 5.32. No excavation unit was identified in area D which was considered to contain an uncontaminated Palmer period working surface across an entire level. Therefore, there are no totally acceptable flake counts for Palmer (or large Palmer) surfaces, but the level 8 values in unit N1E1 may be correct. This level contained 1.9 lbs. of flakes, 0.4 lb. of formal artifacts and one small fragment of a fire cracked hearth stone. The total flake count was only 540, and light flake counts seem typical for Palmer period surfaces on Cactus Hill.

Culture Sequence Summary - Area D

The summary stratigraphic position drawings and sequence charts for diagnostic artifacts from the 1993 excavation units of area D at Cactus Hill are presented as Figure 5.33. Figure 5.34 provides a simplified stratigraphic position drawing for the diagnostic artifacts recovered in just the N2 units of blocks E0, E1, E2, and E3 from west-to-east across the north wall of the 1993 excavation. The artifact sequences for the eight units are not identical because not every tradition was represented in every unit. Reviewed together, a culture sequence for area D of the site from ca. 4,000 B. P. to ca. 9,500 B. P. can be constructed.

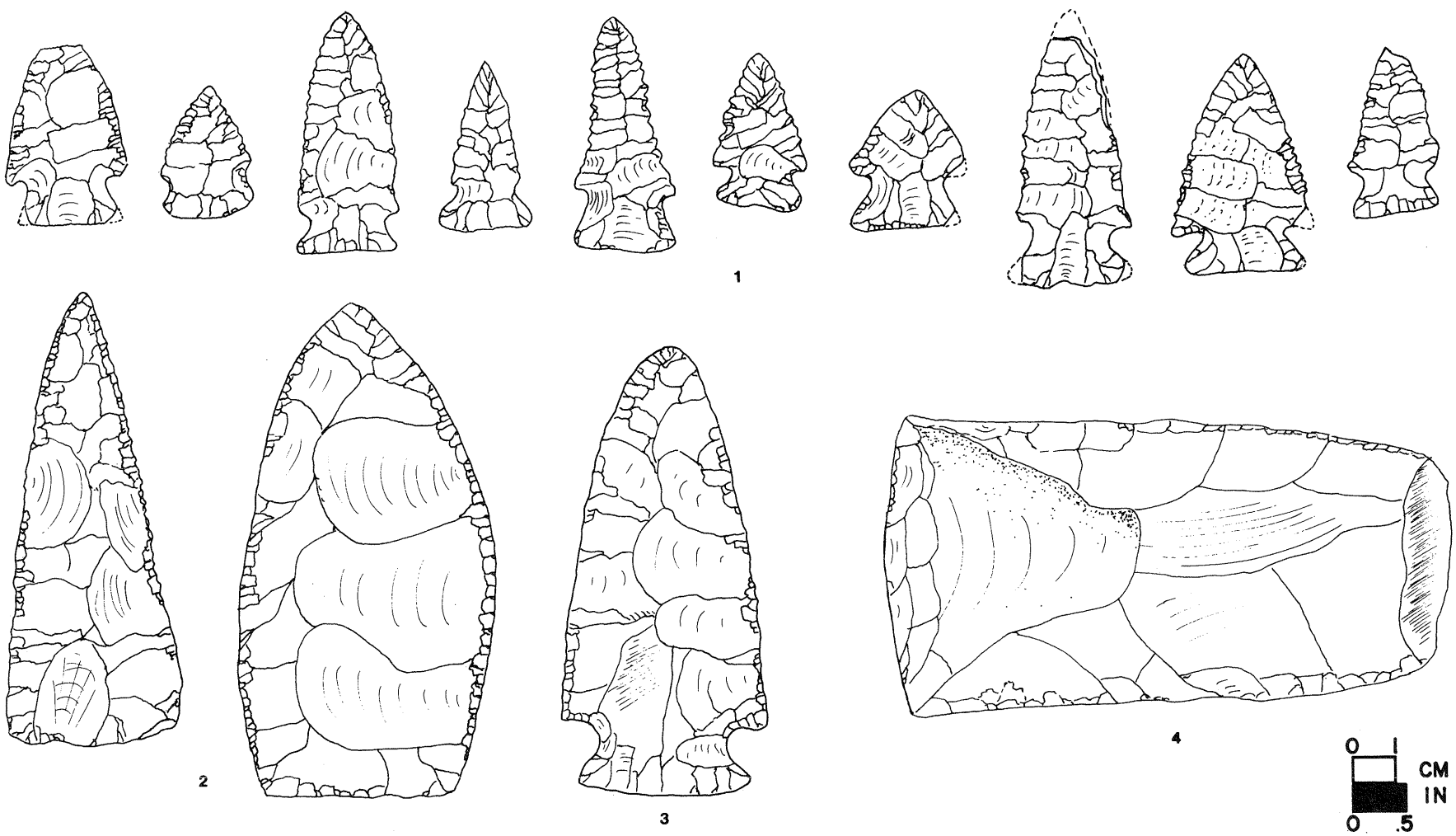


Figure 5.29. Kirk Corner-Notched tradition artifacts from excavations on Cactus Hill, areas D and B. 1, Kirk Corner-Notched point/hafted bifaces (6 of 10 are metavolcanic materials); 2, large unnotched bifacial knives; 3, large notched knife; 4, flaked adz blade.

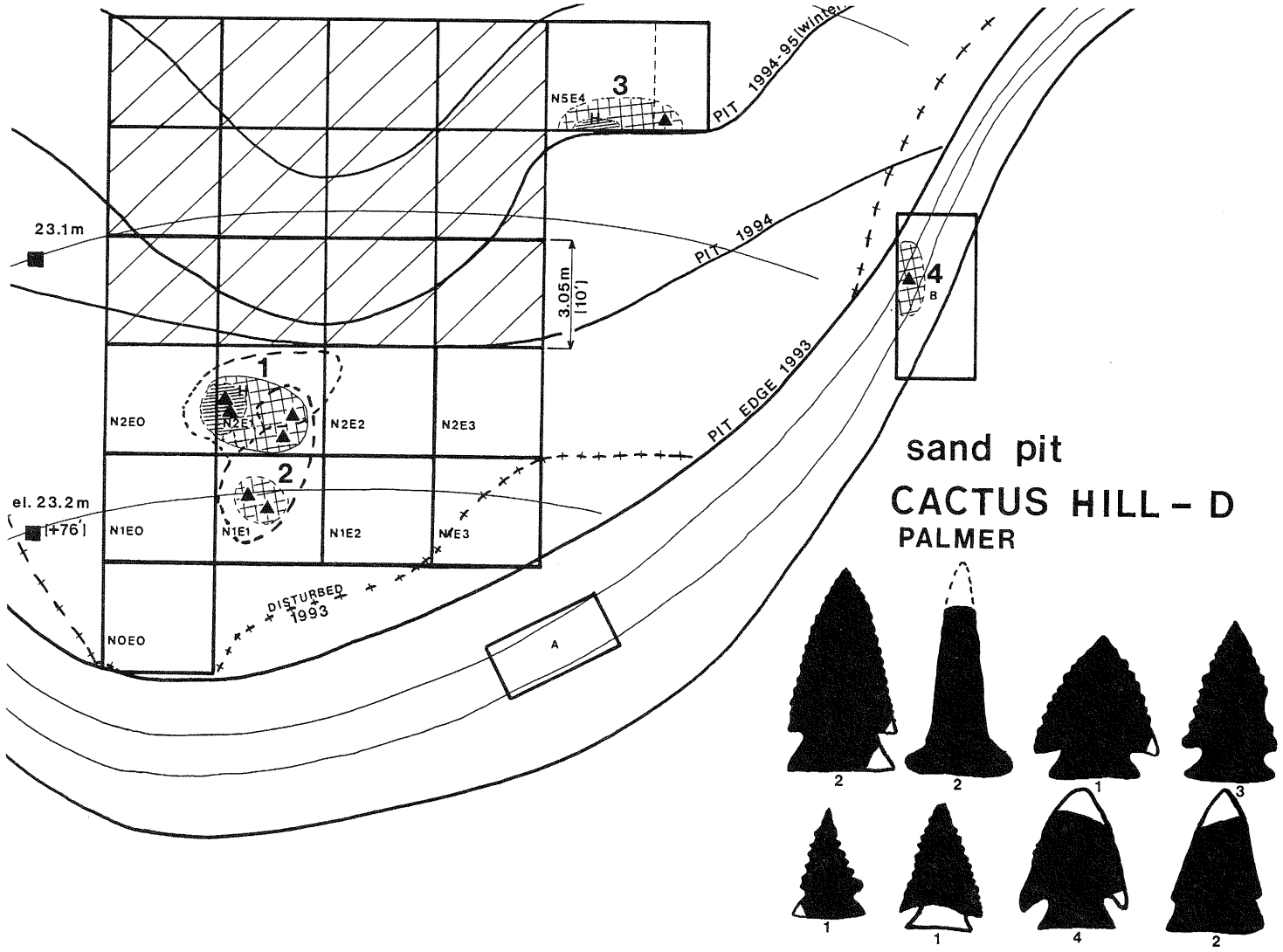


Figure 5.30. Palmer use areas, Cactus Hill area D, 1993 and 1994 (N5E4) excavations plus test units A and B. Triangle=point, H=hearth, cross checked areas=working surfaces. Silhouettes are recorded points from use areas indexed by number to the excavation plan.

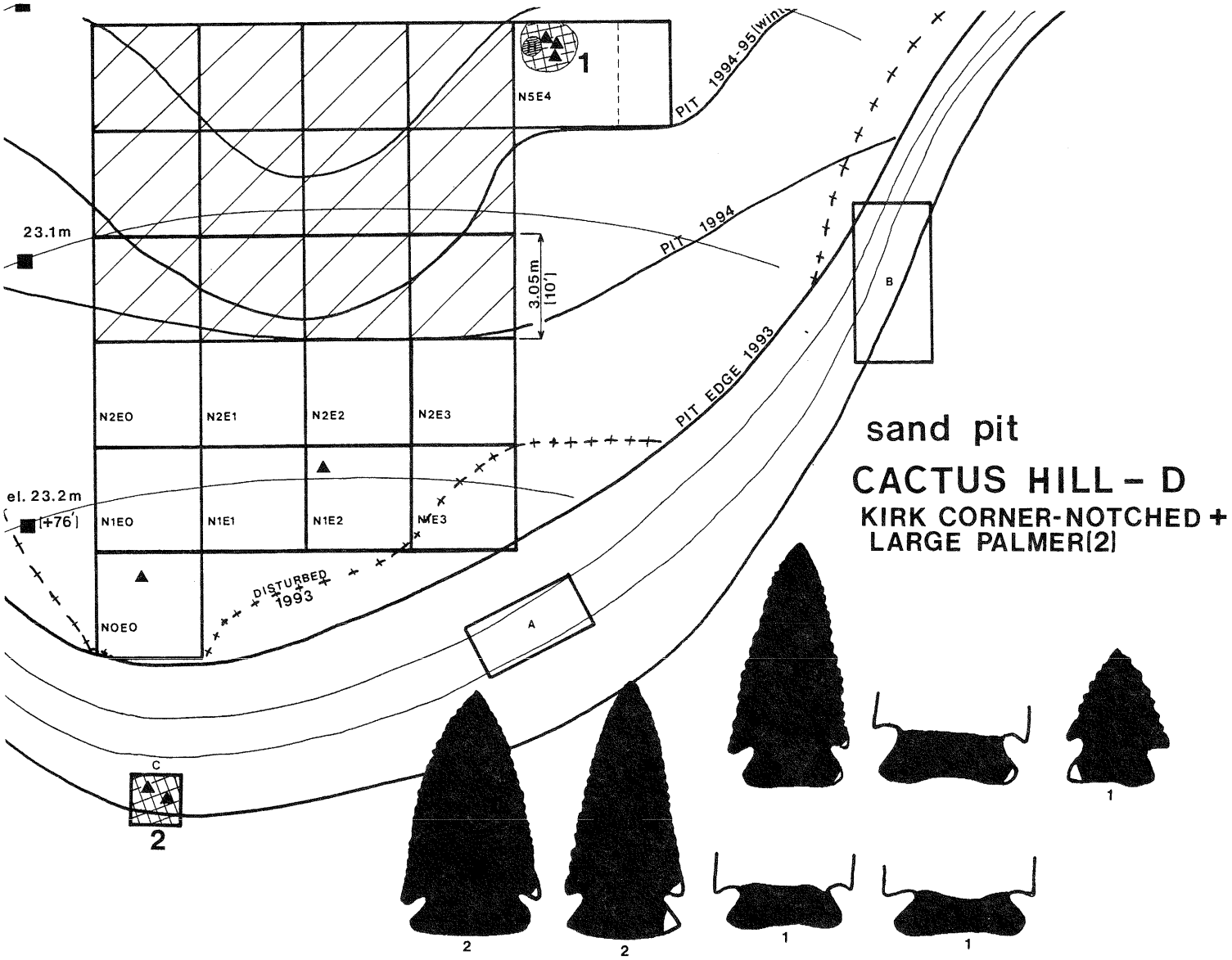


Figure 5.31. Kirk Corner-Notched (early) and large (deep notched) Palmer use areas, Cactus Hill area D, 1993 and 1994 (N5E4) excavations plus test units A and B. Triangle=point or hafted biface, H=hearth, cross checked areas=working surfaces. Silhouettes are recorded points from use areas indexed by number to the excavation plan.

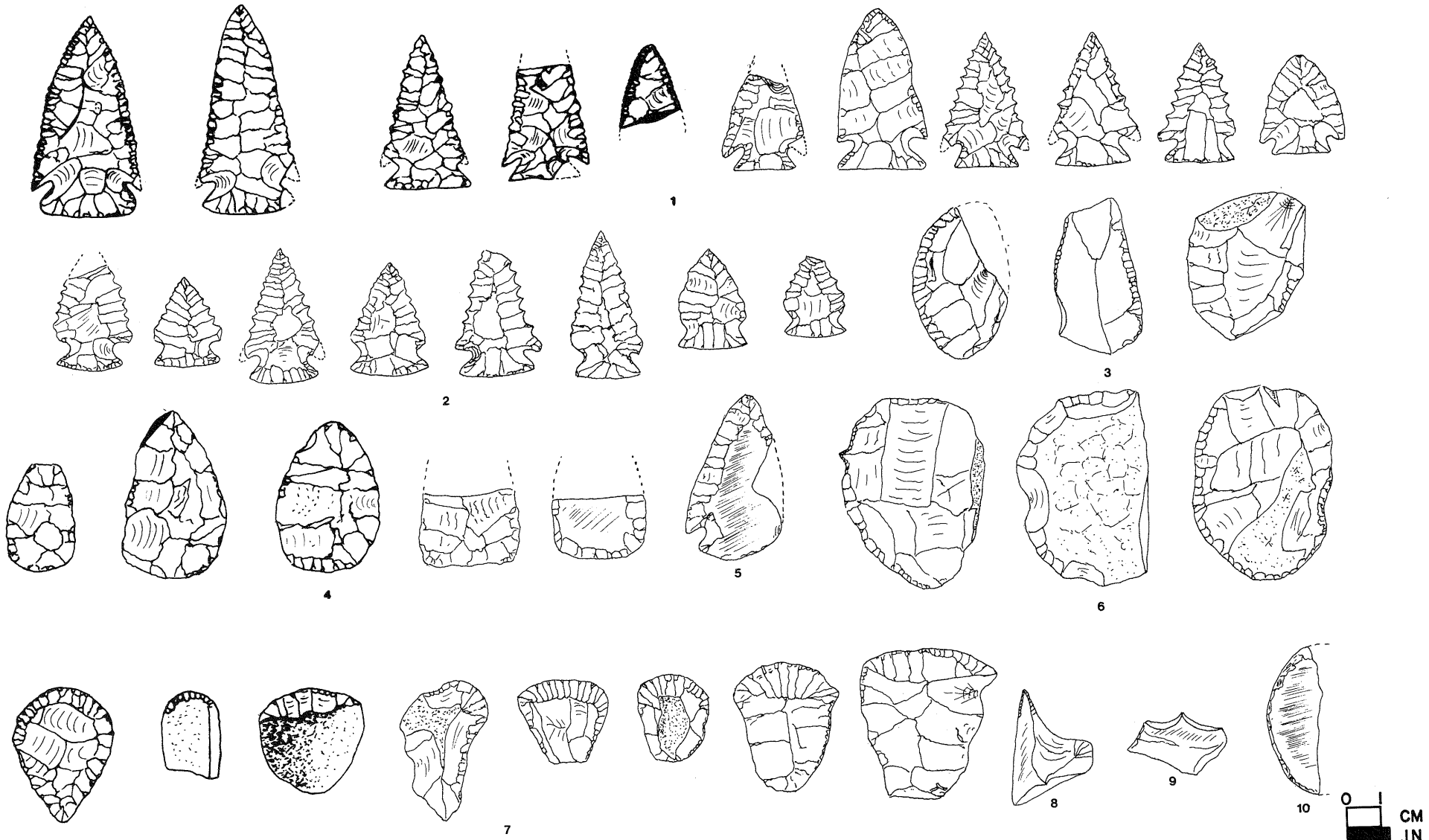


Figure 5.32. Palmer (small Palmer and large Palmer - deep notched) tradition artifacts from excavations on Cactus Hill, areas D and B. 1 and 2, projectile points; 3, side scrapers; 4, biface forms; 5, broken in-process projectile point; 6, side scrapers - large and thick, one with a denticulate; 7, end scrapers; 8, awl; 9, snapped flake graver; 10, circular tabular schist scraper - small.

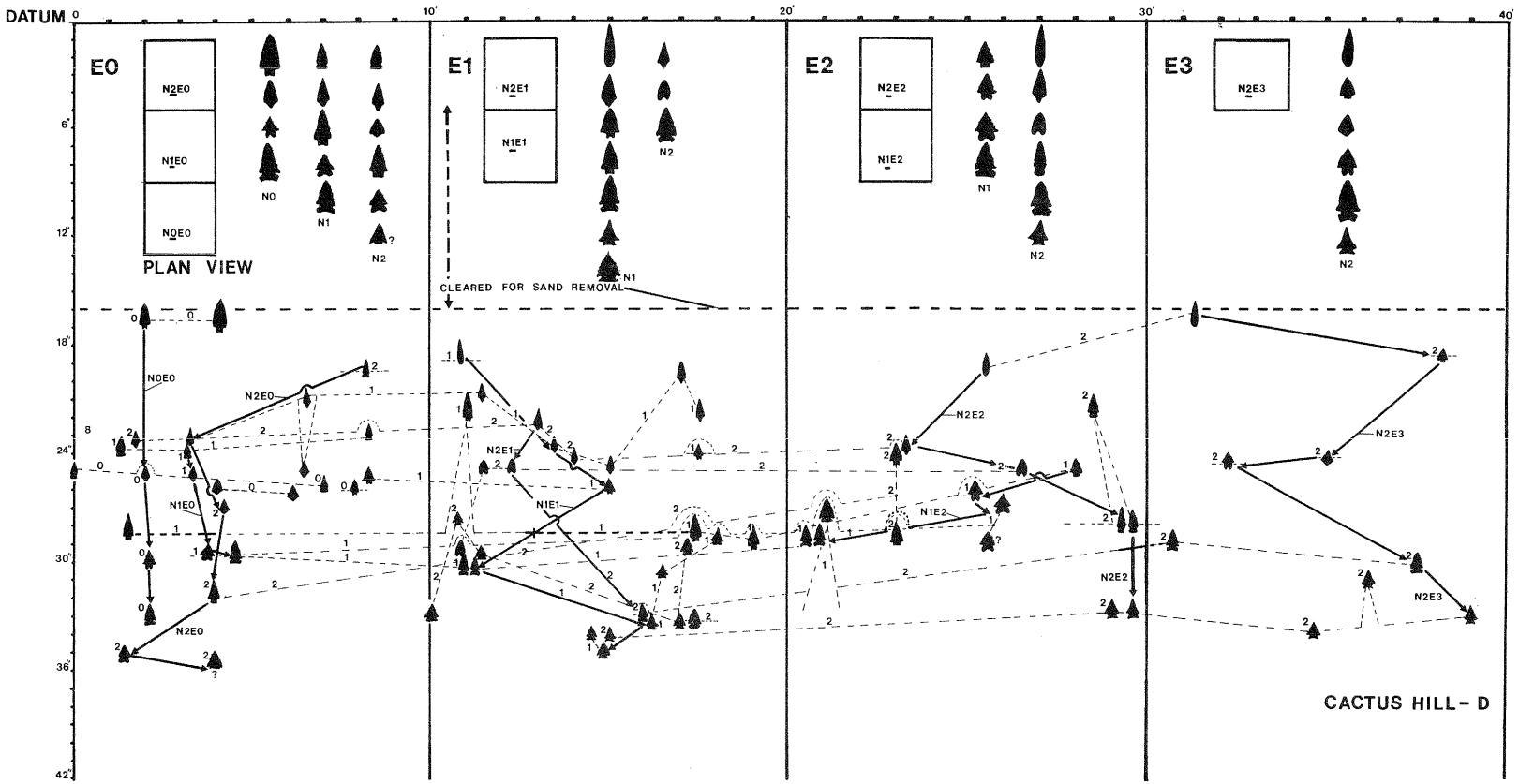


Figure 5.33. Summary stratigraphic position (sequence) of diagnostic projectile points/hafted bifaces from the Cactus Hill, area D, 1993 excavation conducted by Nottoway River Survey. Shown are four excavation blocks (E0, E1, E2, and E3) and eight excavation units within the blocks. Solid lines (vertical) connecting points represent unit sequences; dashed lines (horizontal) connect similar diagnostic artifacts across the N0, N1, and N2 units, thereby establishing the levels occupied by these traditions across the excavation east-to-west.

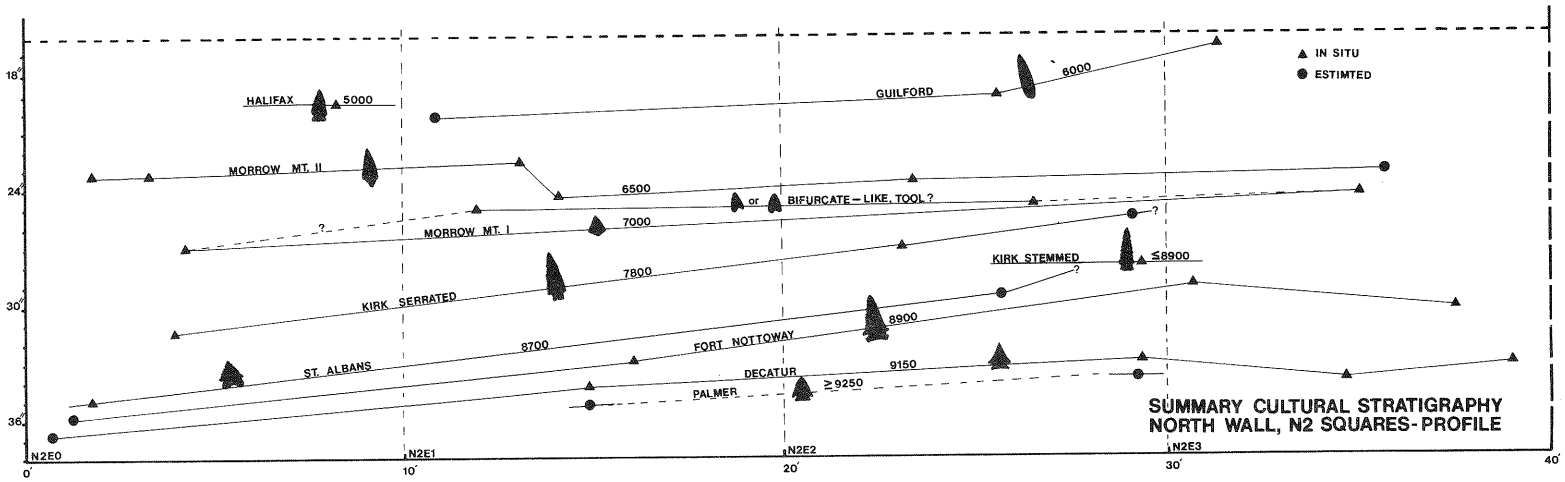


Figure 5.34. Summary stratigraphic position (sequence) of diagnostic projectile points/hafted bifaces from the Cactus Hill, area D, 1993 excavation conducted by Nottoway River Survey. Shown are four excavation units (N2E0, N2E1, N2E2, and N2E3) in four excavation blocks, which represent the north wall, east-to-west, of the excavation. The horizontal lines represent working surfaces of the traditions noted, and dates are estimated years before present (B. P.). This figure is based upon the data in Figure 5.33.

Individual Excavation Units - Area D -

This section presents tabulations of debitage, formal artifacts (including temporally diagnostic artifacts), and hearth stone weights from the eight excavation units investigated in 1993 and limited data from two levels of excavation unit N5E4 investigated in 1994. The primary interest in the N5E4 unit was recovery of non-lithic samples for faunal and floral analysis and 14C dating.

The detail in which individual units are reported in the tables reflects the relative value placed on the data recovered. Where units, or levels within units, were considered relatively uncontaminated, and where diagnostic artifacts and features were present, more detailed analyses of recovered materials were performed. The lithics from the nine excavation units in area D are presented in Tables 5.3 through 5.27 as follows:

Unit N0E0

Table 5.3. 44SX202, CACTUS HILL, AREA D, ANALYSIS OF SQUARE N0E0

Level Ave. Thick-ness	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comment
1A and 1B 5.31" (13.49 cm)	15.11	6.0	2,132 5.1	62 0.55	0.2	1.44	1.5	Savannah River to Halifax (?), Irregular shatter, multi-colored, as level 2 and 3,
2A and 2B 4.13" (10.49 cm)	34.05	20.5	2,794 8.5	121 0.53	2.39	1.5	0.63	Halifax to Morrow Mt. I, Cores are qu cobbles, irregular small shatter, multi-colored,
3A and 3B 4.0" (10.16 cm)	30.14	6.0	3,117 11.5	151 1.31	4.03	4.1	3.2	Morrow Mt. I & II to Early Archaic, Irregular shatter, bipolar cores, multi-colored flakes,
4A and 4B 2.56" (6.50 cm)	19.02	2.5	1,926 8.19	133 0.763	3.35	3.0	1.22	LeCroy to Fort Nottoway
5A and 5B 3.56" (9.04 cm)	14.18	1.063	2,252 7.28	117 0.462	1.875	2.5	1.0	Fort Nottoway to Palmer/Kirk C-N (large variant?)
6 1.57" (4.45 cm)	0.94	--	212 0.50	17 0.06	0.27	0.11	--	No diagnostics (downdrift from levels 5A and 5B)
Total 21.31" (54.13 cm)	113.44 (51.56 kg)	36.06 (16.39 kg)	12,433 41.07 (18.67 kg)	601 3.68 (1.67 kg)	12.43 (5.65 kg)	12.65 (5.75 kg)	7.55 (3.43 kg)	Total flakes=13,034 Total wt flakes=44.75 (20.34 kg) 95.39% qte

Notes Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms

Table 5.4. 44SX202, CACTUS HILL, AREA D, SQUARE N0E0, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
1A and 1B	Projectile points (1): Savannah River/1/qte, Tip/1/yellow qu; Biface/1/qte - Savannah River-like; Biface fragments/2/qte; Bifaces/2/qu - narrow elongated and thick, Biface fragment/1/layered sugar qu; Unifacial pointed tool/1/qte; Edged flake/1/chert; Edge used flake/1/qte; Blade core/1/qu; Flakes*: 1/soft arg, 1/green ss, 1/green translucent rhy, 1/yellow chert, 1/Bolster's Store green chert.
2A and 2B	Projectile points (4): Halifax/1/qu, 1/qte, Morrow Mt. II/1/qte, Morrow Mt. I/1/green arg; Tip/1/qte; Bifaces/1/qte - nearly completed Morrow Mt. II, Bifaces/7/qte - thick elongated ovals, Bifaces/2/qu - ovals, Bifaces/2/qte - thin wide tip fragments, Bifaces/5/qte - small fragments; Thick roughly edged tools/5/qte; Heavy roughly edged end scraper/1/qte; Large rounded perforator/1/qte - heavy tool; Large tabular abrading stone/1/sandstone; Tabular surface used to grind red iron oxide (ore)/1/qte; Edge used flakes/8/qte, 2/qu; Flakes*: 3/burned chert (red), 6/soft arg, 1/coarse rhy, 2/crystal qu, 3/schist fragments.
3A and 3B	Projectile points (2): Morrow Mt. II/1/qte - burned, Morrow Mt. I/1/soft arg; Bifaces/7/qte - thick wide fragments; Biface/1/qu - thin elongated; Edged circular scrapers - unifacial/2/qte; Edged thick flakes/3/qte, 1/qu; Edge used thick bipolar flakes and core fragments/6/qte, 1/qu; Edged thin flakes/2/qte, 1/qu; Small thick tool blanks and bipolar wedges/10/qu, 3/qte - all bipolar technology; Mano used as a hammer and as an anvil/1/red qte - burned; Wedge-like/1/sugar qu; Flakes*: 4/jasper - burned red, 2/yellow jasper, 2/Williamson-like chert - burned, 1/clear Williamson chalcedony - heated, 2/green ss, 1/weathered yellow rhy, 1/weathered gray rhy, 1/schist fragment, 1/crystal quartz.
4A and 4B	Projectile points (1): LeCroy/1/qu; Bifaces/2/qu, 1/qte - wide thin square bases, Biface fragments/2/qte; Thick edged tools/3/qu, 3/qte, Edge used flakes/6/qte, 3/qu; Cobbles with fractured edge used as plane/1/qu, 1/qte; Wedge/1/qu; Large smoothing (abrading) stone with multiple linear fracture planes/1/sandstone - 2 matching fragments; Tabular ferruginous qte abrading stone - rectangular/1/red qte - heavily ground; Flakes*: 3/yellow chert, 3/red jasper, 1/brown chert, 1/brown jasper (?), 1/brown and green opalescent jasper, 3/green ss, 1/gray-green translucent rhy, 1/schist fragment.
5A and 5B	Projectile points (3): Fort Nottoway/1/rhy - blue, Kirk C-N - fragment/1/qte, Early notched (Fort Nottoway?)/1/yellow black speckled chert, Midsection/1/qte - fire fractured; Bifaces/4/qte - fragments; Side scraper - unifacial/1/blue rhy - thin well made; Side scraper - abrader/1/qte; Edged flakes/3/qte; Edge used flakes/10/qte, 1/qu; Wedges and wedge fragments/3/qu, 1/qte; Hammerstone/1/qte; Flakes*: 5/yellow chert, 2/burned jasper - red, 2/brown jasper, 5/green ss, 1/weathered gray rhy, 1/translucent gray rhy, 1/soft arg - yellow.
6	No projectile points; Thick edged core fragment/1/qte; Edged flakes/1/qte, 1/qu; Flakes*: 1/green ss.
Notes	* Flakes other than quartz and quartzite Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Unit N1E0

Table 5.5. 44SX202, CACTUS HILL, AREA D, ANALYSIS OF SQUARE N1E0

Level Ave. Thick-ness	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comment
1 1.43" (3.6 cm)	3.32	2.0	153 0.49	6 0.03	--	0.8	--	No diagnostics
2 2.0" (5.01 cm)	10.04	4.5	852 2.92	33 0.194	1.08	0.94	0.41	No diagnostics
3 2.88" (7.32 cm)	23.17	14.5	1,167 4.07	79 0.334	1.42	1.75	1.1	Halifax
4 1.88" (4.78 cm)	12.75	7.5	659 2.99	41 0.11	0.84	1.09	0.22	Morrow Mt. II to Stanly
5 1.88" (4.78 cm)	18.14	6.0	1,769 5.83	101 0.45	1.11	2.5	2.25	Stemmed point (Kirk ?), bipolar cores
6 1.63" (4.14 cm)	14.97	6.0	1,171 4.96	76 0.56	1.14	1.75	0.59	Kirk Serrated
7 1.94" (4.93 cm)	11.6	3.69	1,704 5.1	68 0.28	0.98	1.14	0.41	Fort Nottoway and St. Albans
8 2.25" (5.72 cm)	19.81	3.06	3,540 10.4	119 0.575	4.77	0.9	--	Fort Nottoway
9 1.88" (4.78 cm)	10.17	0.4	2,425 8.7	51 0.20	0.47	0.4	--	No diagnostics (Decatur ?)
10/11 1.88" (4.78 cm) 1.45" (3.68 cm)	3.43	0.163	1,245 2.77	13 0.063	0.14	0.297	--	No diagnostics (Decatur ?)
Total 20.87" (53.0 cm)	127.4 (57.9 kg)	47.81 (21.73 kg)	14,685 48.23 (21.92 kg)	587 2.80 (1.27 kg)	11.95 (5.43 kg)	11.57 (5.26 kg)	4.98 (2.26 kg)	Total flakes=15,272 Flake wt=51.03 (23.20 kg) 96.16% qte

Notes Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms

Table 5.6. 44SX202, CACTUS HILL AREA D, SQUARE N1E0, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
1	No formal artifacts; No flakes of materials other than qu and qte.
2	No identifiable projectile points: Tip/1/qu; Bifaces/5/qte - thick elongated fragments; Bipolar cores or wedges/1/qte, 1/qu - small; Edged used flakes/1/qte, 1/qu; Flakes* 4/soft arg, 2/green rhy, 1/green arg.
3	Projectile points (4): Halifax/2/qu, 1/qte, Morrow Mt. II/1/qte (low in level); Bifaces/5/qte - elongated narrow ovals - fragments; Roughly edged flakes - unifacial/8/qte, 1/qu; Edged flake - bifacial/1/qte; Edge used flakes and shatter fragments/3/qte; edge used flakes/1/qte, 1/qu; Worked fragments/2/qu - roughly made; Flakes*: 1/soft arg, 2/green arg, 1/gray rhy, 1/green rhy, 2/crystal qu.
4	Projectile points (4): Morrow Mt. II/2/qte, Morrow Mt. I/1/qte, Stanly/1/qte; Bifaces/4/qte - oval fragments, Biface/1/qu - fragment; Biface/1/rhy - flat base; Biface /1/green ss - fragment; Edged cobble fragments/2/qte; Flakes*: 4/soft arg, 1/soft greenstone, 1/yellow schist.
5	Projectile points (1): Stemmed, Kirk serrated fragment(?)/1/qte; Biface fragments/7/qte - thick elongated, Biface fragment/1/soft arg; Bifacial knife/1/qte - thin pentagonal shaped; Bipolar cores or wedges/1/qu, 1/qte; Edged flake/1/qte; Edge used shatter fragment/1/qte; Edge worked tool fragment/1/green ss; Cobble edged tool/1/qte; Flakes*: 5/soft arg, 1/green ss, 2/yellow weathered rhy, 2/burned jasper, 1/crystal quartz..
6	Projectile points (2): Kirk Serrated/1/banded black rhy, Side notched (?)/1/qte; Bifaces/4/qte - elongated - narrow thin; Biface/1/qu - narrow; Side scrapers/2/qu; Side scraper - knife/1/qte; Edged flake/1/qte; Pitted tabular stone - smoothed in pit/1/qte; Flakes*: 2/green rhy, 1/yellow jasper, 1/white chalcedony cobble, 1/fine grain sugar quartz - white.
7	Projectile points (2): St. Albans/1/green translucent rhy, Fort Nottoway/1/qu; Bifaces/2/qte - elongated thick flat base; Side scrapers/2/qte - narrow elongated - unifacial; Edged flake/1/coarse chert; Edge used flakes/6/qte; Bipolar cores/2/qu; End scrapers/1/qte - small delicate tool - 1/chert; Graver/1/jasper; Flakes*: 4/jasper - burned, 2/yellow jasper, 4/chert - pink, 1/green ss, 1/green translucent rhy, 1/crystal qu, 1/yellow schist.
8	No identifiable projectile points: Tip/1/qte - wide Fort Nottoway-like; Bifaces - flat base - wide and thin/4/qte, 1/qu, Bifaces/2/qu - oval; Bifaces - thin tip/1/qte; Bifaces/8/qte - thick irregular shape, Bifaces/3/fragments; Thick side scrapers/3/qte; Side scrapers/2/qte; Edged flakes/10/qte; Edged flake/1/jasper - red; Edge used flakes/11/qte, 1/qu; Tabular scraper/1/schist - yellow; End scraper/1/qte - delicate small tool; Wedges/1/qte, 1/qu; Smoothing stone - abrader/1/dibase; Chopper or ax/1/qte - also used as abrading stone; Flakes*: 5/chalcedony, 2/jasper - burned, 2/jasper - yellow, 1/fossiliferous gray chert, 3/green ss, 3/gray rhy - weathered, 3/soft arg, 1/schist - yellow.
9	No identifiable projectile points: Tip/1/weathered rhy (Decatur ?); Bifaces/3/qte - thin triangular shaped, Biface tip/1/qte, Biface fragments/3/qte - unidentifiable; Edge used flakes/3/qte; Blade core/1/qu; Blade/1/chalcedony; Flakes*: 2/soft arg, 4/chalcedony, 1/green ss, 2/green translucent rhy, 1/fossiliferous gray chert, 1/crystal qu.
10	No projectile points; Biface fragments/2/qte; Edge used flakes/1/qte, 1/green ss; Graver/1/jasper - snapped flake and worked edge; Flakes*: 1/black translucent rhy, 1/weathered yellow rhy.
11	No cultural material
Notes	* Flakes other than quartz and quartzite Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Table 5.7. 44SX202, CACTUS HILL, AREA D, SQUARE N1E0, ALL LEVELS GENERAL FLAKE AND SHATTER ANALYSIS

Level	Quartzite flakes and shatter				Quartz flakes and shatter				Total
	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	#
1	Level not tabulated because of disturbance								
2	40+mm 19 0.516 42.1% dec. 0% bif. 21% bip.	30-40 mm 82 0.875 21.9% dec. 24.4% bif. 7% bip.	20-30 mm 165 -- 13.6% dec. 31.8% bif. 0% bip.	8-20 mm 586 --	30-40 mm 1 0.08	20-30 mm 7 0.08	8-20 mm 25 0.05	Shatter (bipolar) 8 0.08	893
3	40 mm+ 45 1.42 38% dec. 5% bif. 17% bip.	30-40 mm 170 1.16 20% dec. 27% bif. 3% bip.	20-30 mm 200 0.84 9.5% dec.	8-20 mm 752 0.91	40 mm+ 2 0.063	30-40 mm 3 0.069	20-30 mm 19 0.11	8-20 mm 55 0.094 Shatter 11 0.689	1,246
4	40 mm+ 31 0.84 26% dec.	30-40 mm 125 1.11 21% dec.	20-30 mm 171 0.61 11% dec.	8-20 mm 332 0.43	20-30 mm 3 0.016	8-20 mm 21 0.033	Shatter 17 0.11	--	700
5	40 mm+ 55 1.48 21.2% dec 15.6% bif. 3.1% bip.	30-40 mm 226 1.81 22.1% dec. 34.4% bif. 1.53% bip.	20-30 mm 387 1.40 17.3% dec. 30.8% bif. 0% bip.	8-20 mm 1,101 0.69	20-30 mm 19 0.11	8-20 mm 45 0.053	Shatter 37 0.32	--	1,870
6	40 mm+ 58 1.48 23% dec.	30-40 mm 204 1.60 18% dec.	20-30 mm 282 1.23 14% dec.	8-20 mm 627 0.65	30-40 mm 5 0.063	20-30 mm 8 0.031	8-20 mm 34 0.047	Shatter 29 0.42	1,274
7	40 mm+ 52 1.25 24% dec.	30-40 mm 105 0.98 22% dec.	20-30 mm 296 1.297 12% dec.	8-20 mm, 1,251 1.56	8-20 mm 60 0.099	Shatter 8 0.181	--	--	1,772
8	40 mm+ 119 3.28 28% dec.	30-40 mm 266 2.59 17% dec. 23% bif.	20-30 mm 611 2.21 9% dec. 34% bif.	8-20 mm 2,544 2.38	30-40 mm 7 0.068	20-30 mm 21 0.094	8-20 mm 74 0.103	Shatter 17 0.31	3,659
9	40 mm+ 56 1.16 27.2% dec.	30-40 mm 193 1.75 18.7% dec.	20-30 mm 492 1.97 10.5% dec.	8-20 mm 1,684 2.42	8-20 mm 34 0.043	Shatter 17 0.16	--	--	2,476
10	40 mm+ 6 0.172 33.3% dec. 33.3% bif. 0% bip.	30-40 mm 42 0.609 23.8% dec. 21.4% bif 0% bip.	20-30 mm 241 1.09 10% dec. 41% bif. 0% bip.	8-20 mm 956 0.896	8-20 mm 8 0.015	Shatter 5 0.047	--	--	1,258

Notes: wt=pounds
dec.=decortification; bif.=biface; bip.=bipolar

Unit N2E0

Table 5.8. 44SX202, CACTUS HILL, AREA D, ANALYSIS OF SQUARE N2E0

Level Ave. Thick-ness	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comment
1A and 1B 6.75" (17.15 cm)	7.6	4.5	484 1.5	28 0.125	1.08	0.39	--	Halifax - surface Morrow Mt. II - south end; Stemmed/Bifurcate - north end
2 2.13" (5.41 cm)	37.18	17	949 3.55	54 0.4	8.23*	4.5	3.5	Morrow Mt. I - south end Bipolar core technology
3 1.94" (4.93 cm)	11.54	5.5	625 2.38	66 0.188	0.27	2.5	0.703	No diagnostic artifacts All cores are bipolar
4 1.83" (4.65 cm)	8.92	3.5	915 2.76	50 0.289	0.83	0.813	0.725	Kirk Serrated - north end
5 1.75" (4.45 cm)	11.82	0.813	1,488 6.82	38 0.119	1.02	1.39	1.42	No diagnostic artifacts (50% cores bipolar)
6 1.36" (3.45 cm)	15.20	0.394	2,216 10.9	66 0.327	2.03	0.722	0.825	St. Albans - south end
7 2.31" (5.87 cm)	8.37	0.04	1,993 6.71	68 0.14	0.81	0.47	0.2	Probably Decatur (as found in adjacent square N2E1 at this level)
8A and 8B 5.13" (13.03 cm)	1.70	--	423 1.125	13 0.03	0.27	0.27	--	No diagnostics; Decatur (?) downdrift
8B (see above)	0.41	--	37 0.1	1	--	0.31	--	No diagnostics; all downdrift
Total 23.20" (58.94 cm)	102.74 (46.7 kg)	31.75 (14.43 kg)	9,130 35.85 (16.29 kg)	384 1.62 (0.735 kg)	14.54 (6.61 kg)	11.37 (5.17 kg)	7.37 (3.35 kg)	Total flakes=9,514 Flake wt=37.47 (17.03 kg) 95.96% qte

Notes: Qu=quartz; Qte=quartzite; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms
* Includes mortar and hammer/mano found together

Table 5.9. 44SX202, CACTUS HILL, AREA D, SQUARE N2E0 FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
1A and 1B	Projectile points (3): Halifax/1/qu, Morrow Mt. II/2/qte, Tips/2/qte; Bifaces/4/qte - elongated thick ovals, bifaces/3/qu - narrow thick; Edged flakes/3/qte - roughly edged; Edged cobble fragments/3/qte-roughly edged; Red paint stone/1/burned iron oxide (ore); Flakes*: 1/cobble chert. Note: Halifax point and qu bifaces recovered higher in level 1.
2	Projectile points (3): Morrow Mt. I/1/qte, unidentified bifurcate or Lobate/1/qte, Tip/1/qte, Fort Nottoway/1/qte - small basal fragment - burned; Bifaces/3/qte, 1/qu - flat base, thick, triangular; Bifaces/5/qte - thick elongated ovals; Biface tip/1/green ss; Edged flake/1/qte - roughly edged; Edge used flakes/3/qte, 3/qu; Edged cobble core fragment/1/qte; Thick bifacial core or chopper/1/qte - burned; hammerstones/2/qte; Battered cobble/1/qu; Flakes*: 2/green ss, 1/gray weathered rhy, 1/crystal qu, 1/schist fragment.
3	No identifiable projectile points: Tip/1/rhy - weathered - bifurcate-like; Biface fragments/2/qte - small fragments; End scraper/1/qu; Wedge/1/qu; Edge used flake/1/qte - burned; Polished tool fragment/1/metavolcanic or volcanic material - small edge fragment of celt or adz (?); Red paint stone/1/burned iron oxide (ore); Flakes*: 6/green translucent rhy, 3/weathered white rhy, 1/soft arg, 1/black highly silicified rhy - translucent, 4/chert - yellow and gray, 1/crystal qu, 1/black ferruginous qte - non-local.
4	Projectile points (1): Kirk serrated/1/qte, Basal fragment (bifurcate ?)/1/weathered rhy - yellow, Tip/1/weathered yellow white rhy; Bifaces/3/qte - square base thin elongated triangular, 1/striped blue rhy; Biface fragment/1/qte - small flat base fragment; Edged circular cobble fragment - knife(?)/1/yellow qu; Side scraper fragment/1/qte; Edge used hammerstone fragment/1/qte; Polished tool fragment/1/volcanic material; Flakes*: 7/green translucent rhy, 1/black translucent rhy, 1/green ss, 1/jasper - burned red, 3/schist fragments.
5	No identifiable projectile points: Tip/1/qte - serrated with shoulder diagonal notch (Kirk or Fort Nottoway?); Bifaces/5/qte - fragments elongated ovals (?); Bifaces/2/qu - fragments; Biface-knife/1/arg - flat base; Biface tip/1/green ss - wide thin; Edge used flakes/2/qte, 2/crystal qu; Edge worked flake knife or side scraper/1/qte; Worked core fragment/1/qte; Wedges/2/qu; Flakes*: 12/green translucent rhy, 2/green ss, 2/fine grain white weathered rhy, 1/soft arg, 1/waxy gray chalcedony, 2/crystal qu, 5/blue-white chert, 1/yellow schist fragment.
6	Projectile point (1): St. Albans/1/qte, Tips/3/qte - wide thin no serrations, not beveled; Bifaces/3/qte - wide thin ovals; Biface/1/qu - crystal streaked - long narrow with oval base; Edge fragment of polished tool or bannerstone/1/green volcanic material; Edge used flakes/3/qte; Edged thick cobble fragments/5/qte - roughly made tools - heavy; Edged cobble/1/qu; Hammerstone/1/qte; Tabular scraper/1/sandstone; Core blades/2/qte; Flakes*: 18/green translucent rhy, 4/yellow-brown jasper, 3/green ss, 1/white weathered rhy, 2/soft arg, 3/chalcedony, 1/black "mountain" flint, 1/chert- burned red, 1/striped rhy - green.
7	No identifiable projectile points: Tip/1/green rhy - serrated; Bifaces/2/qte - thin wide triangular shaped fragments; Biface fragments - small/1/qte, 1/qu; Bifaces used as abrading stones/2/qte - thick flat with square bases; Edge used flake/1/qte; Edge used cobble fragment/1/qte; Flake knife or small side scraper/1/jasper, Gravers/2/green rhyolite - snapped flake type; Edge used core blades/2/qte; Flakes*: 24/translucent green rhy, 2/black translucent rhy, 3/weathered gray-white fine grain rhy, 2/weathered yellow fine grain black rhy, 4/blue-white chalcedony, 1/dark gray metavolcanic, 2/burned chert - red, 1/gray mountain flint, 3/crystal qu.
8A	No identifiable projectile points: Tip/1/qte - very small; Biface/1/qte - small thin triangular; Edge used flake/1/qte, Edge used core fragment/1/qte; Flakes*: 3/green translucent rhy, 1/black translucent rhy, 1/weathered white fine structure rhy, 1/white chert, 1/jasper - burned red.
8B	No diagnostic or formal artifacts; No flakes other than qte and qu

Notes: * Flakes other than quartz and quartzite
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Table 5.10. 44SX202, CACTUS HILL, AREA D, SQUARE N2E0, ALL LEVELS GENERAL FLAKE AND SHATTER ANALYSIS

Level	Quartzite flakes and shatter				Quartz flakes and shatter				Total
	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	#
2	40 mm+ 24 0.98 37.5% dec. 12.5% bif	30-40 mm 71 0.93 23.9% dec. 29.6% bif. 21.1% bip.	20-30 mm 186 0.806 12.4% dec. 31.2% bif.	8-20 mm 668 0.834	40 mm+ 1 0.05	20-30 mm 2 0.025	8-20 mm 16 0.063	Shatter 35 0.256 57% dec. (bipolar)	1,003
3	40 mm+ 13 0.70	30-40 mm 52 0.53	20-30 mm 136 0.49	8-20 mm 424 0.65	40 mm+ 1 0.01	20-30 mm 6 0.041	8-20 mm 40 0.047	Shatter 19 0.094 (bipolar)	691
4	40 mm+ 21 0.53 28.6% dec. 9.5% bif. 0% bip.	30-40 mm 64 0.597 34.4% dec. 42.2% bif. 0% bip	20-30 mm 257 0.988 10% dec. 31% bif. 0% bip	8-20 mm 573 0.645	30-40 mm 3 0.044	20-30 mm 11 0.040	8-20 mm 24 0.038	Shatter 12 0.163 (bipolar)	965
5	40 mm+ 70 2.093	30-40 mm 153 1.75	20-30 mm 254 1.22	8-20 mm 1,011 1.76	30-40 mm 1 0.01	20-30 mm 6 0.032	8-20 mm 25 0.030	Shatter 6 0.047 (bipolar)	1,526
6	40 mm+ 96 2.89 26% dec. 19.8% bif. 0% bip	30-40 mm 312 3.56 13% dec. 28% bif. 0% bip	20-30 mm 684 2.67 13% dec. 34% bif. 0% bip	8-20 mm 1,124 1.58	30-40 mm 3 0.30	20-30 mm 19 0.063	8-20 mm 31 0.038	Shatter 13 0.188 (bipolar)	2,282
7	40 mm+ 52 1.38 29% dec.	30-40 mm 236 2.20 15% dec.	20-30 mm 530 1.66 10% dec.	8-20 mm 1,175 1.47	30-40 mm 1 0.01	20-30 mm 19 0.052	8-20 mm 37 0.033	Shatter 11 0.049 (non-bipolar)	2,061
8A	40 mm+ 16 0.250	30-40 mm 34 0.271	20-30 mm 87 0.292	8-20 mm 286 0.313	--	--	8-20 mm 11 0.015	Shatter 2 0.015	436

Notes: wt=pounds
dec.=decortification; bif.=biface; bip.=bipolar

Unit N1E1

Table 5.11. 44SX202, CACTUS HILL AREA D, ANALYSIS OF SQUARE N1E1

Level Ave. Thick-ness	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comment
1 1.63" (4.14 cm)	13.92	8.0	415 1.7	38 0.11	0.81	0.3	3.0	Guilford to Morrow Mt. (mixed)
2 1.37" (3.48 cm)	13.64	5.65	630 3.05	70 0.29	2.45	0.2	2.0	Morrow Mt. II (mixed)
3 2.25" (5.72 cm)	16.58	7.5	1,150 3.4	85 0.38	3.0	0.8	1.5	Morrow Mt. II to Kirk Serrated/Bifurcate
4 3.63" (9.22 cm)	24.23	3.5	2,670 11.5	240 1.0	3.22	1.7	3.31	Morrow Mt. II to Stanly-like (?)
5 3.06" (7.77 cm)	22.85	1.03	3,214 15.1	216 0.92	3.53	0.52	1.75	Kirk to Decatur
6 1.83" (4.65 cm)	3.48	0.08	514 1.73	18 0.08	0.5	1.09	--	Fort Nottoway to Decatur
7 2.50" (6.35 cm)	8.42	--	1,706 5.8	199 0.39	0.75	0.625	0.85	Decatur
8 1.50" (3.81 cm)	2.42	0.05	513 1.83	29 0.09	0.4	0.05	--	Palmer/Deep Notched
9 1.50" (3.81 cm)	0.25	--	71 0.18	5 0.02	--	0.05	--	Downdrift
Total 19.27" (48.95 cm)	105.79 (48.09 kg)	25.81 (11.73 kg)	10,883 44.29 (20.13 kg)	900 3.28 (1.49 kg)	14.66 (6.66 kg)	5.34 (2.34 kg)	12.41 (5.64 kg)	Total flakes=11,783 Flake wt=47.57 lb. (21.62 kg) 93.1% qte

Notes: Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms

Table 5.12. 44SX202, CACTUS HILL, AREA D, SQUARE N1E1 FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
1	Projectile points (2): Guilford/1/qte, Morrow Mt. II/1/qte; Bifaces/6/qte - fragments; Flake knife/1/qu, 1/qte; Edge used core fragments/2/qte; Core fragments/5/qte; Core fragments/3/qu; Flakes*: 2/weathered rhy - white, 1/weathered green arg.
2	Projectile points (2): Morrow Mt. II/1/qte; Morrow Mt. I/1/qte; Bifaces/7/qte - fragments - thick ovals; Biface/1/qu - fragment; Biface/1/qu - square base; Notched ax-like biface/1/qte; Abrading stone/1/qte - burned red; Large core fragments/14/qte; Wedges/2/qte; Flaked ax/1/qte - tabular cobble fragment; Flakes*: 1/green shale or slate, 2/weathered rhy - white, 1/soft arg, 1/coarse green rhy.
3	Projectile points (4): Morrow Mt. II (?)/1/qte - broken; Kirk Serrated/1/qte; Kirk Serrated/1/rhy - gray striped; Kirk Serrated/1/green ss - fragment; Bifaces/6/qte - elongated ovals- thin; Bifaces/2/qu - elongated oval thin fragment; Edged flake knife/1/green ss; End scraper/1/qu - roughly edged; Side scraper/1/qu; Worked core fragment/1/cobble chert - small; Edged core tools - heavy/3/qte, wedge/1/qte; Flakes*: 3/green ss, 2/crystal qu, 1/green rhy, 1/schist fragment.

Table 5.12. 44SX202, CACTUS HILL, AREA D, SQUARE N1E1 FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
4	Projectile points (1): Wide weakly stemmed (Stanly ?)/1/qte - burned red; Tip/1/qte; Bifaces/7/qte - fragments; Bifaces/4/qu - fragments; Biface/1/Mitchell chert knife; Edge worked flakes with stem-like haft elements/2/qte; Edge worked flake/1/rhy; Edge worked flake knives/2/qte, Edge used flakes/5/qte; Serrated flake/1/qte; Edge worked cobbles/5/qu, 1/qte; Red paint stone/3/iron oxide (ore) - burned and abraded; Hammerstone/1/qte - used cobble; Tabular scraper/1/gray schist - fragment; Snapped flake graver/1/green ss; Manuport/1/qte; Smoothing (abrading stone)/1/qte; Flakes*: 4/green ss, 4/red chert - burned; 2/arg, 3/crystal qu, 2/yellow chert, 5/green fine grain rhy, 1/black rhy with white spots, 1/Williamson chert, 2/jasper - burned red, 2/yellow brown jasper, 1/yellow weathered rhy.
5	Projectile points (2): Decatur drill or resharpened/1/qte; Serrated tip (Kirk?)/1/qte; Bifacial knives (square base)/2/qte; Bifaces/11/qte - fragments; Bifaces/4/qte - elongated square base; Biface fragments/2/qu; Edge worked flaked knife/1/qte; Edged worked flake/1/green ss; Serrated flake knife/1/qte; Edge used flakes/6/qte; Edge used flakes/2/qu; Thick edged flake of core fragment/3/qte; End scrapers/2/qu - delicate tools; Tabular side scraper/1/schist; Smoothing (abrading) stones/2/qte; Cobble chopper/1/qte; Flakes*: 4/green highly silicified slate, 1/black translucent rhy, 1/yellow chert, 1/translucent white-blue chalcedony, 2/jasper - burned red, 1/crystal qu.
6	Projectile points (3): Fort Nottoway/2/qte; Decatur/1/qte - small fragment; Biface fragments/3/qte - thick wide ovals; Biface/1/qte - thin triangular knife fragment; Biface/1/qu - thick oval; Side scraper/2/qte - fragments; Edged flake knife/1/qte; Edged used flakes/5/qte; Pointed side scraper/1/qte; Tabular scraper fragment/1/schist; Flakes*: 1/white chalcedony, 1/green translucent rhy.
7	Projectile point (2): Decatur/2/qte; Biface/1/qte - large wide square base; Biface fragments/6/qte - thin oval or square base; Edge worked flakes/2/qte, Edge used flakes/10/qte, 1/qu, Side scraper/1/qte; Bipolar cores or wedges/2/qu - small and thin; Red paint stone/1/iron oxide (ore) - burned; Large notched smoothing (abrading) stone/1/qte; Edge worked flake knife/1/jasper - delicate small tool; Flakes*: 3/yellow jasper or chert, 2/red and white chert - heated, 1/cobble chert, 1/yellow rhy, 1/green ss, 1/dark green translucent rhy, 2/jasper - burned red, 3/crystal qu, 4/near crystal qu.
8	Projectile point (2): Palmer/1/qte - heated, Palmer-like drill/1/jasper - both large Palmer type; Biface/1/qte - triangular thin fragment; Edge used flakes/2/qte; Edge worked flakes/2/qte - large heavy tools; Flakes*: 1/white chalcedony, 1/burned pink chalcedony, 1/black chert-like material, 1/black fine grain translucent rhy, 1/crystal qu.
9	No formal artifacts No flakes other than qte and qu

Notes: * Flakes other than quartz and quartzite
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Table 5.13. 44SX202, CACTUS HILL, AREA D, SQUARE N1E1, LEVEL 7 ONLY, FLAKE AND SHATTER ANALYSIS - DECATUR TRADITION

Level	Quartzite flakes and shatter				Quartz flakes and shatter				Total
	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	#
7	40-70 mm 78 1.64 40% dec.	30-40 mm 175 1.48 16% dec.	20-30 mm 403 1.36 12.9% dec.	8-20 mm 1,050 1.31	30-40 mm 1 0.075 Shattered cobble (core ?)	20-30 mm 10 0.023 10% dec.	8-20 mm 188 0.39 11.2% dec.	--	1,706 qte 199 qu

Notes: wt=pounds; #=number of flakes; dec=decortification
Not included are 4 qte core fragments which weigh 0.77 lb.
Bipolar flakes are not tabulated, but were few; most flakes were from bifacial core reduction

Unit N2E1

Table 5.14. 44SX202, CACTUS HILL, AREA D, ANALYSIS OF SQUARE N2E1

Level Ave. Thick-ness	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/Weight (lb.)	Qu Flakes and Shatter #/Weight (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comment
1 2.75" (6.99 cm)	17.46	14.5	602 1.77	36 0.179	0.81	0.20	0.093	Morrow Mt. II
2 2.19" (5.56 cm)	14. 6	8.5	930 3.34	130 0.471	1.16	0.93	0.20	Morrow Mt. II - south end of sq. Morrow Mt. I - north end of sq.
3 2.25" (5.71 cm)	14.76	6.5	825 2.64	86 0.329	3.15	0.923	1.22	Stemmed, type ? - north end of sq.
4 1.50" (3.81 cm)	18.69	6.5	1,760 5.24	381 1.1	2.2	2.58	1.07	Palmer - south end of sq. Middle Archaic - north end of sq.
5 2.00" (5.08 cm)	17.42	2.0	1,699 7.98	240 1.08	2.25	3.1	1.19	Palmer - south end of sq. Fort Nottoway - north end of sq.
6 1.88" (4.78 cm)	6.4	0.25	1,214 3.67	101 0.25	0.20	1.1	--	Palmer - south end of sq. Fort Nottoway - north end of sq.
7 2.25" (5.71 cm)	3.76	0.05	711 2.61	56 0.08	0.25	0.64	0.125	Decatur, Plevna, Fort Nottoway Pit/hearth bottom - north/Palmer - south
8 1.75" (4.45 cm)	2.93	--	654 2.1	60 0.1	0.2	0.53	--	Below Palmer - south end of sq. Below Decatur - north end of sq.
9 2.56" (6.50 cm)	1.18	--	298 0.64	22 0.047	0.15	0.34	--	Downdrift, pit bottoms
Total 19.13" (48.59 cm)	97.2* (44.2 kg)	38.3 (17.41 kg)	8,693 (9,447)* 29.99 (13.63 kg)	1,112 (1,114)* 3.64 (1.65 kg)	15.49 (7.04 kg)	10.34 (4.7 kg)	3.90 (1.77 kg)	Total flakes=9,805 (including pit=10,559) Flake wt=33.63 (15.29 kg) 88.66% Qte

Notes: Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms
*Flakes/cores from pit extending from level 6 to level 9 weigh 4.56 lb., therefore N2E1 total weight is 101.76 lb.
Total number of flakes in pit: 754 qte; 2 qu

Table 5.15. 44SX202, CACTUS HILL AREA D SQUARE N2E1 FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
1	Projectile points (1): Morrow Mt. II/1/qu, Tip/1/qte; Bifaces/4/qte - fragments elongated thick, 1/qu - small oval; Edge used flake/1/qte; Edge used cobble spall/1/qte; - large; Red paint stone/1/iron oxide (ore) - burned; Flakes*: 1/green ss, 1/yellow jasper, 1/black translucent rhy.
2	Projectile points (3): Morrow Mt. II/1/qte, Bifurcated base biface/1/rhy - shoulderless, bifurcated base biface/1/qu - shoulderless; Biface fragments/8/qte - thick elongated ovals, 1/qu - thick oval, 1/qte - thick crescent; Side scraper/1/qte - small; Edge used flake/1/qte; Thick edged core fragment/1/qte; Denticulate on a biface/1/qte - several serrations; Red paint stone/1/iron oxide (ore) - burned; Flakes*: 3/green fine grain rhy, 1/green ss, 1/weathered yellow rhy, 1/gray coarse rhy, 1/crystal qu.
3	Projectile point (1): Kirk serrated (?)/1/qte; Bifaces/2/qte - thin ovals - fragments, 1/qu - small oval; Edged cobble fragments/2/qte - one large used as chopper; Edged cobble/1/qu; Side scraper/1/qte - roughly edged; Edge used flake/1/qte, 1/qu; Wedge fragments/2/qu; Bog iron fragment/1/unmodified; Flakes*: 1/jasper - burned, 1/chalcedony - burned, 1/brown jasper, 2/chalcedony, 2/arg, 9/green ss, 2/coarse blue rhy, 4/gray fine grain translucent rhy, 1/crystal qu, 1/schist fragment.
4	Projectile point (1): Palmer/1/chert - burned pink - south hearth area; Bifaces/4/qte - 3 early stage - 1 thin fragment, 1/qte - triangular - used as a knife - resharpened - thin; Biface fragments/5/qu - rough early stage; Side scrapers/2/qu; Worked core fragment - edged/4/qu, 2/qte; Wedge fragments/4/qu; Edged flakes/2/qte; Edge used flake/1/qte; Edge worked flake/1/rhy - graver-like; Hammerstone/1/qte; Core fragment used as a hammer/1/qte; Bipolar cores/2/qu; Bipolar core fragments/12/qte; Flakes: 9/black fine grain rhy, 2/green rhy, 14/green ss, 2/striped purple rhy, 2/green coarse rhy, 3/arg - weathered, 2/coarse metavolcanic (?), 4/yellow rhy, 5/Williamson chert, 3/yellow jasper, 2/white silicified wood, 2/Bolster's Store green chert, 1/fossiliferous gray chert, 2/crystal qu, 2/layered qte or chert, 3/schist fragments.
5	Projectile points (3): Palmer/1/qte - south end, Triangular or bifurcated base (?)/1/qu - unshouldered; Fort Nottoway fragment/1/qte; Hafted notched uniface/1/qu, Biface/1/jasper - Palmer level, Bifaces/7/qte - 4 large, 3 small, all thin square base; Side scraper/1/qte; Edge used flakes/3/qte - 2/qu; Wedges/2/qte fragments, Wedge/1/qu; Smoothing or abrading stones/2/qte; Tabular schist object/1/fragment; Red paint stone/1/iron oxide (ore) - burned; Side scraper/1/qu; Flakes*: 28/green ss, 19/fine grain light gray rhy, 22/black fine grain translucent rhy, 11/green fine grain translucent rhy, 2/red jasper - burned, 2/yellow jasper, 7/chalcedony, 1/Williamson blue chalcedony, 2/burned chalcedony, 5/crystal qu.
6	Projectile points (2): Palmer/1/qu - south end, Fort Nottoway/1/qte - burned and fire cracked (one piece in level 7); Biface/1/rhy - unnotched projectile point preform, 1/qte - large very thin oval - broken; Biface fragments/2/qte - thin square base; Edge used flakes/2/qte; Flakes*: 6/green fine grain translucent rhy, 3/jasper, 2/yellow rhy - weathered, 1/cobble chert, 8/black fine grain translucent rhy, 5/brown flint - mountain type, 13/chalcedony, 4/crystal qu, 2/gray rhy, 1/coarse metavolcanic, 8/ schist fragments.
7	Projectile points (4): Palmer/1/chert - Mitchell, Decatur/1/qte - north end, Fort Nottoway/1/qte - very small basal fragment, Plevna/1/rhy - weathered yellow, Fort Nottoway fragment/1/qte - in fire pit - matched fragment from level 6; Side scraper/1/qte; Side scraper/1/qu, Edged cobble/1/qte, Edge used flakes/2/qte; Snapped flake graver/1/brown jasper; Flakes*: 4/brown jasper, 1/cobble chert, 1/chert - burned, 3/crystal qu, 14/green slate or rhy, 2/black fine grain rhy, 2/pink rhy, 4/yellow rhy, 1/yellow chert.
8	No complete projectile points; Tip/1/qte - thin well made End scraper/1/qte - small delicate tool - burned; Bifacial knife/1/qte - thin well made; Edge used flakes/3/qte; Edge used core fragment/1/qte; Flakes*: 3/Williamson chert, 2/red chert - heated, 6/gray fine grain rhy, 4/crystal qu, 2/yellow rhy - fine grain, 1/fibrous chert, 1/jasper-chert mixture, 1/rhy - green.
9	No formal artifacts; Flakes*: 1/brown jasper - weathered, 3/brown jasper, 4/green fine grain translucent rhy, 1/pink chalcedony, 1/crystal qu.

Notes: *Flakes other than quartz and quartzite.
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

ADDENDUM TO TABLES 5.14 AND 5.15. 44SX202, CACTUS HILL, AREA D, SQUARE N2E1, LEVELS 6 TO 9, FORT NOTTOWAY PERIOD FLAKE FILLED PIT - FEATURE N2E1-6/9-F2

Size: 12" to 15" diameter, 12" deep

Description

Densely packed with debitage, including flakes, core remnants and discard artifacts as follows:

Core # 1: Bifacial, light glassy gray quartzite; size, 98 mm x 68 mm x 31 mm, refitted from 5 fragments; weight=0.545 lb.; total flakes from core #1=9; size=15-70 mm; weight=1.75 lbs.

Core # 2: Cobble core, reduced by blade-like flakes in a manner to produce a flat or bifacial (?) surface, light glassy gray quartzite, very similar to core #1; size - restructured as 9 flakes only - no size of original core could be determined; weight=0.48 lb.; total flakes from core # 2 plus similar core # 1 (not tabulated above)=537 (142 were 25-60 mm, 268 were 12-25 mm, and 127 were 6-12 mm); weight=1.70 lbs.

Core # 3: Large quartzite spall core, dark glassy gray-brown; 14 fragments and flakes; weight=0.375 lb.

Core # 4: Gray quartzite - some large grains; flakes only=10; all 25-50 mm; weight=0.141 lb.

Unknown cores: 6 flakes - all dark glassy quartzites; weight=0.11 lb.

Other flakes: 2 small quartz flakes; 2 small rhyolite flakes - dark gray - fine structure; 1 small green silicified slate; 2 yellow brown jasper

Formal artifacts: one jasper flake worked into a spokeshave (intrusive ?); one wide thin biface mid-section fragment.

Table 5.16. 44SX202, CACTUS HILL, AREA D, SQUARE N2E1, LEVELS 1 THROUGH 9 GENERAL FLAKE AND SHATTER ANALYSIS

Level	Quartzite flakes and shatter				Quartz flakes and shatter				Total
	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	#
1	40 mm + 13 0.353 lb. 25% dec.	30 -40 mm 61 0.67 lb. 32.8% dec.	20-30 mm 103 0.48 lb. 10.3% dec.	12-20 mm 425 0.27 lb.	30-40 mm 1 0.016 lb.	20-30 mm 11 0.053 lb. 9% dec.	12-20 mm 16 0.032 lb.	shatter 8 0.078 75% dec.	638
2	30 mm+ 91 1.27 lb. 24% dec.	< 30 mm 839 2.07 lb. 10% dec.	--	--	30-40 mm 4 0.063 lb.	20-30 mm 21 0.093 lb.	12-20 mm 78 0.081 lb.	shatter 6 0.23 lb.	1,039.
3	40 mm + 56 0.765 lb. 34% dec.	< 40 mm 769 1.88 lb. 11% dec.	--	--	30-40 mm 59 0.078 lb.	20-30 mm 14 0.063	12-20 mm 59 0.078 lb.	shatter 7 0.094 lb.	964.
4	40-70 mm 32 0.91 lb.	30-40 mm 154 1.63 lb.	20-30 mm 602 1.78 lb.	8-20 mm 972 0.93 lb.	40-50 mm+[1] 4 0.18 lb.	20-30 mm[2] 40 0.11	8-20 mm 337 0.82 lb.	--	2,141
5	45-70 mm+ 56 1.83 lb.	30-45 mm 266 2.97 lb.	20-30 mm 375 1.67 lb.	8-20 mm 1,002 1.52 lb.	30-40 mm 2 0.1 lb.	20-30 mm 8 0.03 lb.	8-20 mm 230 0.95 lb.	--	1,939
6	40-50 mm+ 21 0.58 lb.	30-40 mm 114 1.32 lb.	20-30 mm 262 0.98 lb.	8-20 mm 817 0.79 lb.	30-40 mm 3 0.09 lb.	20-30 mm 8 0.04 lb.	8-20 mm 90 0.12 lb.	--	1,315
7[3]	40-50 mm+ 11 0.55 lb.	30-40 mm 66 0.89 lb.	20-30 mm 175 0.70 lb.	8-20 mm 459 0.47 lb.	40-50 mm[1] 3 0.11	20-30 mm[2] 9 0.04 lb.	8-20 mm 44 0.04 lb.	--	767
8	45-55 mm+ 12 0.27 lb.	30-45 mm 44 0.17 lb.	20-30 mm 158 0.70	8-20 mm 440 0.61 lb.	30-40 mm 1 0.03 lb.	20-30 mm 3 0.01 lb.	8-20 mm 56 0.06 lb.	--	714
9	40-50 mm+ 6 0.094 lb.	30-40 mm 18 0.17 lb.	20-30 mm 51 0.18 lb.	8-20 mm 223 0.20 lb.	30-40 mm (none)	20-30 mm 1 0.005 lb.	8-20 mm 21 0.042 lb.	--	320

Notes: dec.=decortification; wt=pounds

[1] Greater than 40 mm=shatter; [2] No flakes or shatter were recorded at 30-40 mm; [3] See detailed flake and shatter analysis below

Table 5.17. 44SX202, CACTUS HILL, AREA D SQUARE N2E1, LEVEL 7: DETAILED FLAKE AND SHATTER ANALYSIS

Material	Qte				Total	Qu				Total
Size (mm)	40-50	30-40	20-30	8-20		40-50	30-40	20-30	8-20	
Quantity	11	66	175	459	711	3	0	9	44	56
% Level Total	1.55	9.28	24.61	64.56	100	5.36	0	16.07	78.57	100
Decortification Flakes	4	9	27	30	70	0	0	0	3	3
% Size Total	36.36	13.64	15.43	6.54	--	0	0	0	6.82	--
Thick Shatter	2	0	11	16	29	2	0	0	17	19
% Size Total	18.18	0	6.29	3.49	--	66.67	0	0	38.64	--
Biface Reduction Flakes	0	36	85	N/A	121 of 252	1	0	4	N/A	5 of 12
% Size Total	0	54.53	48.57	--	--	33.33	0	44.44	--	--
Bipolar Reduction Flakes	0	3	0	N/A	3 of 252	0	0	1	N/A	1 of 12
% Size Total	0	4.54	0	--	--	0	0	11.1	--	--
Other	5	18	52	N/A	75 of 252	0	0	4	N/A	4 of 12
% Size Total	45.45	27.27	29.71	--	--	0	0	44.44	--	--

Unit N1E2

Table 5.18. 44SX202, CACTUS HILL, AREA D, ANALYSIS OF SQUARE N1E2

Level Ave. Thick-ness	Total Weight (lb.)	FCR (lb.)	Qte Flakes* and Shatter #/wt (lb.)	Qu Flakes* and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comment
1A, 1B, and 1C 8.44" (21.43 cm)	30.66	10.23	2,128 9.27	355 1.20	3.89	4.47	1.60	Stemmed point - Kirk Serrated (?) - south end of sq.
2 3.00" (7.62 cm)	27.35	13.5	1,345 6.56	278 1.60	3.14	1.55	1.0	St. Albans - south end of sq.
3 3.44" (8.74 cm)	41.6	3.69	3,799 21.74	374 1.78	5.89	4.5	4.0	Fort Nottoway - north end of sq., plus debitage and FCR indicative of bifurcate
4 3.13" (7.95 cm)	8.07	0.047	1,060 4.66	71 0.343	0.947	0.5	1.57	Downdrift, or Decatur (?)
5A and 5B 6.75" (17.15 cm)	5.32	0.078	645 2.84	89 0.448	1.23	0.72	--	Downdrift, or Decatur plus Palmer (?)
Total 24.76" (62.89 cm)	113.0 (51.36 kg)	27.54 (12.52 kg)	8,977 45.07 (20.48 kg)	1,167 5.37 (2.44 kg)	15.10 (6.86 kg)	11.74 (5.34 kg)	8.17 (3.71 kg)	Total flakes=10,144 Flake wt=50.44 lb. (22.93 kg) 88.50% Qte

Notes Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms
*Screen size (for flakes)= 12 mm vs. normal screen size.

Table 5.19. 44SX202, CACTUS HILL AREA D, SQUARE N1E2, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
1A, 1B and 1C	Projectile point (1): Kirk Serrated/1/qte; Bifaces/9/qte - wide moderate thickness, 1/qu; circular end scraper/1/qte; Edged tools/6/qu - thick roughly edged on bipolar core fragments; Edged flake/1/green ss; Side scraper/1/qte; Edged cobbles/6/qte - thick roughly edged; Edge used flakes/15/qte, 4/qu, 1/green ss; Wedges/2/qu; Bipolar core fragments/2/qu; Smoothing stone/1/qte - core fragment; Tabular scraper/1/gray schist - symmetrical; Red paint stone fragments/3/iron oxide (ore) - burned; Flakes*: 1/green ss, 2/fine grain gray rhy - weathered, 2/coarse grain rhy, 1/yellow chert, 1/crystal qu, 1/burned river cobble chert.
2	Projectile points (2): LeCroy/1/qu, St. Albans/1/rhy - weathered white; Bifaces/6/qte - wide thick square base, Bifaces/9/qte - narrow thick ovals; Bifaces/4/qu - narrow thick; Biface/1/arg - narrow thick; Bifaces /2/green ss - wide thin square base; Edged flakes /4/qte; Edge used flakes/6/qte, 1/qu; Wedges/2/qu; Bipolar cores or wedges/6/qte, 3/qu; End scrapers/1/jasper, 1/qte; Chopper/1/qte - cobble; Flakes*: 4/chert - burned red, 2/green ss, 2/gray rhy, 1/black rhy, 1/soft arg, 1/yellow chert, 1/crystal qu.
3	Projectile points (4): Bifurcated (unidentifiable)/1/qu, Fort Nottoway/3/qte, Tip (Fort Nottoway ?)/1/qte; Bifaces/19/qte - most wide thin with flat bases; Bifaces/3/qu - narrow elongated; Biface/1/qu - wide thin; End scrapers/2/qte, 1/green rhy; Drill tip/1/qte, Side scrapers/8/qte, 1/qu; Tabular scraper/1/schist; Edge used flakes/37/qte; Polyhedral blade core/1/qte; Wedges or bipolar cores/2/qu; Smoothing (abrading stones)/2/qte - fractured cobbles; Worked shatter fragments/4/qu, 2/qte; Large partly worked cobble flakes/3/qte; Flakes*: 13/yellow chert, 6/greenstone (flakes from resharpening a polished tool - adz or celt ?); 1/red rhy, 1/yellow weathered rhy, 2/soft arg, 1/red river cobble chert, 2/burned jasper, 3/dark gray translucent rhy, 1/black weathered rhy, 1/fossiliferous gray chert, 1/green ss, 1/green rhy, 2/crystal qu.

Table 5.19. 44SX202, CACTUS HILL AREA D, SQUARE N1E2, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
4	Projectile points (1): Kirk Side Notched/1/qte - disturbed soil area, Tip/1/qte - serrated; Biface/1/qte - circular thick used as chopper (?); Worked core fragments/2/qu; Bipolar core flakes/2/qu (same core); Edge worked thick flake/1/qte; Edge used flakes/7/qte; large tabular flake/1/sandstone; Core blade/1/qte; Flakes*: 1/yellow chert, 1/black translucent rhy, 1/black flint - mountain type, 1/red chert, 1/green ss, 1/green arg
5A and 5B	No projectile points; Biface fragments/2/qte - small; Edge worked flakes/2/qte; Edge used flakes/3/qte, 1/qu; Smoothing (abrading) stones/2/qte; Large core chopper/1/qte; Core blades/2/qte; Flakes*: 2/yellow chert, 1/chert - burned pink, 2/weathered rhy, 1/green ss.

Notes: *Flakes other than quartz and quartzite.
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Table 5.20. 44SX202, CACTUS HILL, AREA D, SQUARE N1E2, LEVELS 2 and 3 FLAKE AND SHATTER ANALYSIS

Level	Quartzite flakes and shatter				Quartz flakes and shatter				Total
	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	#
2	40 mm+ 62 1.375 31% dec. Shatter 15 0.875 lb., 43% dec.	30-40 mm 151 1.59 18% dec.	20-30 mm 242 1.078 14% dec.	12-20 mm 875 1.64	30-40 mm 12 0.191 23% dec. Shatter 26 0.77 lb., 68% dec.	20-30 mm 33 0.203 21% dec.	12-20 mm 207 0.438 17% dec.	--	Qte=1,345 Qu=278
3	40 mm+ 232 6.06 22% dec. Shatter 25 1.63 lb., 40% dec.	30-40 mm 499 4.52 11% dec.	20-30 mm 1,278 6.67 12% dec.	12-20 mm 1,765 2.86 12% dec.	30-40 mm 18 0.198 15% dec. Shatter 39 0.77 lb. mostly dec.	20-30 mm 98 0.417 18% dec.	12-20 mm 219 0.398 14% dec.	--	Qte=3,799 Qu=374

Notes dec.=decortification; wt=pounds; Qte=quartzite; Qu=quartz

Unit N2E2

Table 5.21. 44SX202, CACTUS HILL AREA D, ANALYSIS OF SQUARE N2E2

Level Ave. Thick-ness	Total Weight (lb.)	FCR (lb.)	Qte Flakes* and Shatter #/wt (lb.)	Qu Flakes* and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comment
1A and 1B 5.06: (12.85 cm)	5.33	3.2	327 0.87	32 0.09	0.06	0.7	0.41	Guilford to Morrow Mt. II
2 3.0" (7.62 cm)	6.47	4.0	268 0.793	27 0.156	0.41	0.5	0.613	Morrow Mt. II (?) to Kirk Stemmed/Kirk Side Notched ?
3 2.38" (6.05 cm)	21.75	12.0	1,151 3.4	152 0.63	1.67	2.15	1.9	Morrow Mt. II to Kirk Serrated
4 1.75" (4.45 cm)	10.74	3.5	565 1.99	69 0.359	0.468	0.922	3.5	No diagnostic artifacts; bipolar qu cores, bifurcate?
5 3.75" (9.53 cm)	26.39	6.0	2,108 9.7	338 1.25	5.0	3.5	0.94	Decatur, Fort Nottoway, Kirk Side Notched and Kirk Serrated, pit bottom
6 3.50" (8.89 cm)	17.97	0.2	2,504 10.35	220 0.96	4.125	1.8	0.53	Decatur - Fort Nottoway
7 3.38" (8.59 cm)	1.62	0.053	301 0.919	37 0.141	0.01	0.37	0.125	No diagnostics
8 1.68" (4.27 cm)	0.69	--	127 0.25	8 0.02	--	0.42	--	No diagnostics
Total 24.50" (62.23 cm)	90.96 (41.35 kg)	28.95 (13.16 kg)	7,351 28.27 (12.85 kg)	883 3.61 (1.64 kg)	11.74 (5.34 kg)	10.36 (4.71 kg)	8.02 (3.64 kg)	Total flakes=8,234 Flake wt=31.88 (14.49 kg) 88.68% Qte

Notes *All recovered flakes 13 mm size or greater; flake totals are therefore low.
Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms

Table 5.22. 44SX202, CACTUS HILL, AREA D, SQUARE N2E2 FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
1A and 1B	Projectile points (2): Guilford/1/qte, Morrow Mt. II/1/qte.
2	Projectile point (1): Kirk stemmed or side notched/1/qu; Biface/1/qte - thick flat base; Side scrapers/2/qte; Flakes*: 2/green ss, 1/green rhy.
3	Projectile points (3): Morrow Mt. II/1/qte, Kirk Serrated/1/qu, Unknown bifurcate (unshouldered)/1/qte; Bifaces/6/qte - elongated ovals; Biface/1/qu - oval; Net sinkers; 3/qte - notched cobbles; Flakes*: 4/green ss, 1/soft arg.
4	No projectile points: Bifaces/2/qte - elongated fragments; Biface/1/qu - oval; Edge used flakes/4/qte; End scraper/1/qu; Red paint stone/1/iron oxide (ore) - burned; Flakes*: 1/soft arg.
5	Projectile points(5): Kirk Serrated/1/green ss, Kirk Stemmed/Kirk Side-Notched/1/qte, 1/qu, Decatur/2/qte; Bifaces/6/qte - wide thin; Biface/1/qu - flat base thin; small biface fragments/3/qte; Biface/1/jasper - fragment; Bifaces/2/qte - thick chopper-like; End scraper/1/qu - roughly edged on split cobble; Edged flakes/6/qte; Edge used flakes/17/qte, 2/qu; Edged cobbles/2/qte; Cobble core fragments edge used/4/qte, Bipolar core fragments edge used/8/qu; Edged bipolar cores/flakes/2/qu; Wedges/2/qu; Hammerstone/1/qte; Grinding stone/mortar fragment/1/dibase; Blade-like edge used flake/1/green ss - long and narrow; Flakes*: 3/soft arg, 5/gray rhy, 1/green and gray rhy, 2/chert - burned red, 3/jasper - burned red, 2/yellow jasper, 1/fibrous chert, 1/white Williamson chert, 1/crystal qu, 1/schist fragment.
6	Projectile points (3): Fort Nottoway/1/qte basal fragment, Decatur/2/qte, Tip/1/qte - Decatur-like, (Note: the Fort Nottoway base fragment matched a basal fragment from square N1E2, level 3); Bifaces/8/qte - wide thin triangular with flat bases; Biface fragments (small)/11/qte; Edged flake/1/rhy; Edged flakes/7/qte, 1/qu; Edged flake/1/rhy - translucent black; Edge used flakes/18/qte, 1/qu; Edge used flake/1/jasper; Edge used core fragments/7/qte, 7/qu - most qu bipolar; Smoothing (abrading) stones/1/qte, 1/sandstone slab; Cobble chopper - worked one side/1/qte - large; Wedges/2/qte, 1/qu; Serrated flake/1/qte; Serrated bifacial knife (matches fragment from level 4 square N1E2); Core blades/6/qte - some edge used/worked; End scraper (small delicate tool)/1/rhy; Red paint stone/1/iron oxide (ore) - burned; Flakes*: 3/crystal qu, 2/soft rhy, 1/silicified wood, 1/black rhy with white spots, 1/gray fine grain rhy, 1/green ss, 1/black rhy, 1/chert - burned pink, 1/fossiliferous gray chert; 4/fine grain burned and weathered white-red qte.
7	No projectile points; Edge worked (unifacial) flake knife/1/gray rhy; No flakes other than qte and qu.
8	No projectile points; No other formal artifacts or flakes other than qte and qu.

Notes: *Flakes other than quartz and quartzite.
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

*Table 5.23. 44SX202, CACTUS HILL, AREA D, SQUARE N2E2, LEVELS 5 AND 6 ONLY, FLAKE AND SHATTER ANALYSIS**

Level	Quartzite flakes and shatter				Quartz flakes and shatter				Total
	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	Size/#/wt	#
5	40 mm+ 82 2.33 43% dec.	30-40 mm 358 3.2 20% dec.	20-30 mm 812 3.02 14% dec.	13-20 mm 856 1.15	20-30 mm 8 0.052 75% dec.	13-20 mm 314 0.72	Shatter 16 0.478 62.5% dec.	--	2,446
6	40 mm+ 72 2.04 45% dec. 16.7% bif. 8% bip.	30-40 mm 362 3.54 18% dec. 34% bif. 5% bip.	20-30 mm 1,172 3.65 15.8% dec. 40.4% bif. 0% bip.	13-20 mm 898 1.12	20-30 mm 14 0.086 64.3% dec.	13-20 mm 196 0.427	Shatter 9 0.345 66.7% dec.	--	2,723

Notes *All flakes 13 mm size or greater.
dec.=decortification; bif.=biface; bip.=bipolar

Unit N2E3

Table 5.24. 44SX202, CACTUS HILL, AREA D, ANALYSIS OF SQUARE N2E3

Level Ave. Thick-ness	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comment
1 2.93" (7.46 cm)	7.9	5.0	251 0.707	26 0.119	--	1.78	0.291	Stemmed point, Kirk Serrated (?)
2 1.56" (3.96 cm)	15.96	8.9	834 3.1	119 0.392	--	1.9	1.67	No diagnostics
3A and 3B 4.25" (10.80 cm)	19.79	10.0	1,108 4.05	167 0.572	0.147	2.5	2.52	LeCroy - south end of sq.
4 1.69" (4.29 cm)	9.75	3.6	1,075 3.63	157 0.48	0.44	0.69	0.91	Morrow Mt. I - north end of sq., Large amount of white quartz flakes, and tools, probably LeCroy
5 1.38" 3.51 cm)	12.9	1.54	1,324 5.17	123 0.38	4.2	0.31	1.3	No diagnostics
6A and 6B 4.50" (11.43 cm)	17.55	0.25	2,490 11.75	122 0.494	2.34	1.04	1.68	Fort Nottoway
7 2.06" (5.23 cm)	9.25	--	1,256 5.9	88 0.34	1.75	0.75	0.50	Fort Nottoway/Decatur
8 2.0" (5.08 cm)	6.65	--	1,218 4.05	49 0.125	2.09	0.38	--	Decatur
9 3.88" (9.86 cm)	0.915	--	194 0.641	15 0.05	0.05	0.096	0.078	No diagnostics
Total 24.25" 61.6 cm)	100.67 (45.78 kg)	29.29 (13.31 kg)	9,750 39.0 (17.73 kg)	866 2.95 (1.34 kg)	11.02 (5.0 kg)	9.45 (4.29 kg)	8.95 (4.06 kg)	Total flakes=10,616 Flake wt=41.95 lb. (19.07 kg) 91.89% Qte.

Notes: Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms

Table 5.25. 44SX202, CACTUS HILL, AREA D, SQUARE N2E3 FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
1	Projectile point (1): Stemmed/1/qte - thin Kirk Serrated (?); Bifaces/2/qte - thick elongated ovals; Edge used flake/1/qte; Paint stone/2/red and yellow iron oxide (ore); Flakes*: 1/green ss, 1/jasper - burned, 1/coarse speckled rhy, 1/arg.
2	No recorded formal artifacts; No flakes other than qu and qte
3	Projectile point (1): LeCroy/1/qu (south end of square), Tip/1/qte; Bifaces/4/qu - elongated narrow and oval, 4/qte - elongated narrow; Side scraper/1/Mitchell chert - yellow; End scraper/1/qte - thick and roughly edged; Edged flake/1/qte; Flakes*: 5/green ss, 1/fine structure gray rhy, 1/arg - gray, 1/cobble rhy - weathered yellow, 1/chert-like layered material, 1/crystal qu, 1/slate fragment.
4	Projectile points (2): Morrow Mt. I (?)/1/qte, 1/gray shale (north end of square - slope); Bifaces/2/qte, 1/qu - thick early stage ovals; Edge used flakes/4/qu; Wedge/2/qu; Bipolar cores/3/qu; Edged flakes/2/qu; Unifacial flake tool - snapped edge/1/translucent rhy; Flakes*: 2/chert - burned, 1/green ss, 1/jasper, 1/gray shale - weathered light green, 1/chalcedony-like, 3/fine grain qte - burned.
5	No projectile points; Biface fragments/1/qu, 2/qte - triangular shape - small; End scraper-like tools/2/qte - roughly edged; Wedge/1/qu; Bipolarized items - wedges (?)/2/qte; Large hammerstone, anvil or mortar/1/ferruginous qte; Large edge used flake/1/qte; Flakes: 6/jasper, 1/blue-black rhy, 1/blue-red chalcedony, 1/green rhy, 1/black translucent flint - mountain-like, 1/crystal qu.
6	Projectile points (2): Fort Nottoway/2/qte, Tip/1/rhy - serrated and beveled - probably Fort Nottoway (?); Biface/1/qte - late stage - thin; Large edged flake choppers/3/qte; Side scrapers/3/qte - roughly edged; Edged flake knives/1/green ss - 1/qte; Edged used flakes/11/qte, 1/jasper; small chisel or adz/1/qte - chipped blade with edges ground - well made; Red point stone/1/iron oxide (ore) - burned; Flakes*: 1/arg, 2/jasper, 2/burned jasper, 1/coarse rhy, 3/fine grain dark rhy, 2/crystal qu, 1/qte - fine grain translucent, 2/chalcedony, 2/green ss.
7	Projectile points (1): Decatur/1/qte; Bifaces/1/qte, 1/qu - large fragments; End scraper/1/qu - roughly edged; Side scraper/1/qte - roughly edged; Scraping edge - thick and tabular/1/qte; Hammerstone/1/ferruginous qte; Edge used flakes/10/qte; Flakes*: 8/jasper, 4/burned jasper, 2/translucent dark fine grain rhy, 1/green ss, 1/fossiliferous gray chert, 1/crystal qu.
8	Projectile points (2): Decatur/1/oolitic qte, 1/qte, Tip/1/qte; Bifaces/3/qte - thick oval fragments; Side scrapers/4/qte - roughly edged; Edge used flakes/6/qte, 1/qu; Edged flakes/3/qte; Cobble hammerstone/1/qte (75 mm x 50 mm); End scraper/1/qte - delicate small tool; Flakes*: 5/jasper, 1/green ss, 1/black translucent rhy.
9	No projectile points; Edge used flake/1/qte; Flakes*: 1/black rhy.

Notes: *Flakes other than quartz and quartzite.
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Table 5.26. 44SX202, CACTUS HILL, AREA D SQUARE N2E3, LEVEL 6 ; DETAILED FLAKE AND SHATTER ANALYSIS

Material	Qte				Total	Qu				Total
Size (mm)	40-50	30-40	20-30	8-20	--	40-50	30-40	20-30	8-20	--
Quantity	15	52	169	562	798	2	1	15	36	54
% Level Total	1.88	6.52	21.18	70.43	100	3.70	1.85	27.78	66.67	100
Decortification Flakes	6	10	21	25	62	0	0	2	6	8
% Size Total	40.0	19.23	12.43	4.45	--	0	0	13.33	--	--
Thick Shatter	3	0	0	0	3	0	0	3	8	11
% Size Total	20.0	0	0	0	--	0	0	20.0	--	--
Biface Reduction Flakes	6	25	47	N/A	78 of 236	0	1	5	N/A	6/18
% Size Total	40.0	48.08	27.81	--	--	0	100	33.33	--	--
Bipolar Reduction Flakes	0	1	2	N/A	3	2	0	4	N/A	6/18
% Size Total	0	1.92	1.18	--	--	100	0	26.67	--	--
Other	0	14	99	N/A	113 of 236	0	0	1	N/A	1/18
% Size Total	0	26.92	58.58	--	--	0	0	6.67	--	--

Notes: Qte=quartzite; Qu=quartz;

Unit N5E4

*Table 5.27. 44SX202, CACTUS HILL AREA D, PARTIAL ANALYSIS OF SQUARE N5E4; LEVELS 5 AND 7 ONLY**

Level	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comment
5	23.5	3.09	2,507 5.05	132 0.28	--	0.84	1.36	Kirk Serrated - east end of square
7	20.5	0.11	2,464 8.54	352 0.60	2.48	1.94	0.53	Decatur hearth - north end of sq.

Notes: * Abbreviated lithic analysis - unit excavated for recovery of floral and faunal remains and feature analysis, all lithics retained.
Qu=quartz; Qte=quartzite

Area B Archaeological Excavations

Excavation area B at Cactus Hill was investigated intermittently from 1989 through early 1993, intensively in October 1993, and again intermittently in 1994. The 1994 work was in most cases a salvage response to relic collecting/looting of the site, and in one case this work was a result of information provided to NRS by a single individual conducting private research on the site.

The earliest work conducted by NRS on the Cactus Hill Site was in area B (east end), and produced the sequence shown in Figure 5.35a within the upper region of the geological cut also shown as Figure 5.35b. This clearly indicated the potential of the Cactus Hill Site for establishing culture sequences in a stratified context. Other areas around the sand pit in area B produced similar results. As the sand pit moved to the west, the depth of cultural deposits appeared to vary from approximately 20 to 30 inches.

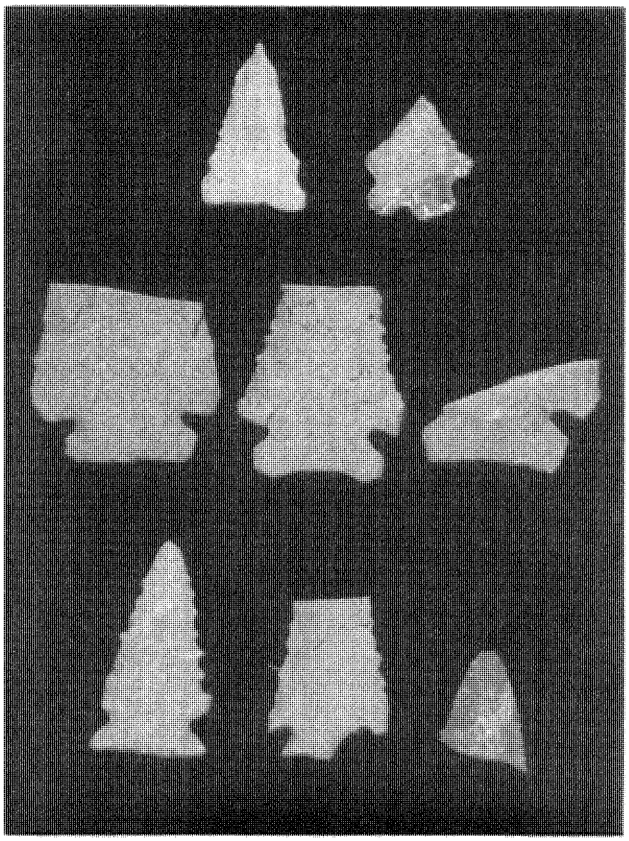


Figure 5.35a. Diagnostic artifact sequence as excavated in 1989 near the sand pit edge in area B, Cactus Hill Site. Initial Cactus Hill excavation. 15.00" below surface, bifurcate and untyped point; 22 to 26" below surface, Fort Nottoway point fragments; 30 to 31" below surface, Palmer point and fragments.

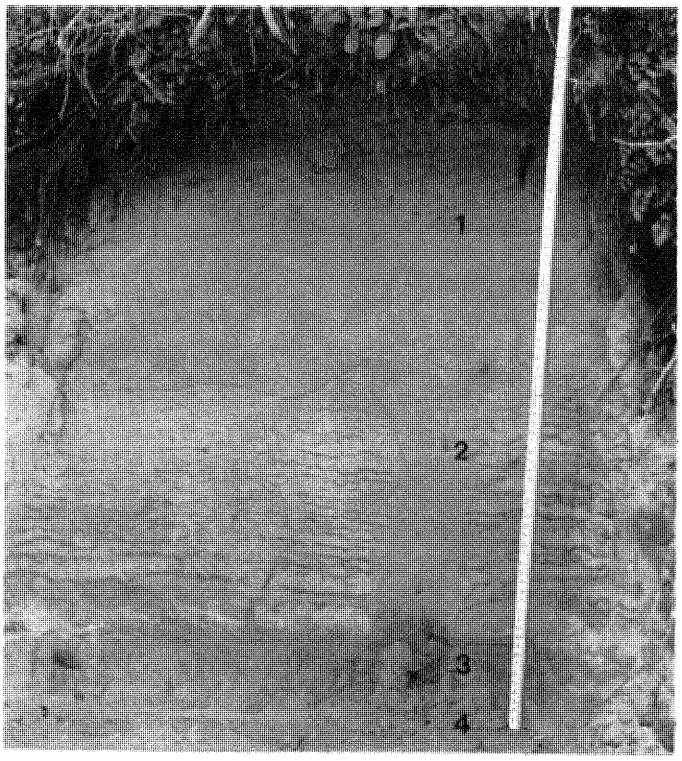


Figure 5.35b. Geological cut placed into the wall of the sand pit in area B of Cactus Hill, near the location of the excavation sequence shown in Figure 5.35a. Area 1 and above, cultural deposit 32" below surface (obscured by tree roots); area 2, lamellar (banded) eolian sand; area 3, paleosol (?), above clay unit; area 4, clay.

The previous section concerning excavation area D discussed in detail the culture sequence on Cactus Hill from approximately 5,000 B. P. to 9,500 B. P. Area D was discussed first to set the ground work for the area B excavation analysis. This approach was necessary because the integrity of the stratified deposits in area D of the site was higher than that observed by NRS anywhere else on Cactus Hill. Unfortunately, the span of occupation at area D was shorter than that observed on the south ridge in both area A and area B. To obtain a complete picture of the overall culture sequence both area D and area B (or A) required investigation. Johnson has investigated area A and this work, which appears as Appendix G, clearly indicates earlier site use than observed in area D. Johnson's work stands alone as an independent analysis of the site, and it will not be discussed here. The reader is referenced to Appendix G for analysis and conclusions concerning area A of Cactus Hill.

The duration of human use of the south ridge at area B of Cactus Hill clearly spans the time period from ca. 11,000 B. P. to ca. 250 B. P. (9,000 B. C. to 1,750 A. D.). Also, it is possible that the span of use of this area may be 1,000 to 4,000 years longer than that stated. The basic problems with the ridge top location of area B at Cactus Hill are the depth of the deposit (generally less than of 30 inches), and the very heavy prehistoric period use of this area of the site. These two issues, site depth and intensity of use, combine to greatly reduce the integrity of the cultural deposits here, and much of area B is simply an uninterpretable "till" of Archaic age material. Thus, the value of area D is clear in sorting out some of the culture sequence problems in area B.

Below the Archaic period till in area B there was a light Paleoindian occupation, perhaps 1,000 to 1,500 or more years before the onslaught of heavy Archaic age site use. In a few locations undisturbed remnants exist of the earlier Paleoindian use of the site. But, as the original site use by these people was very light, it was difficult to locate those few areas where anything remained in the correct sequence.

The cultural record in the time period from approximately 1,500 B. P. (500 A. D.) to 4,000 B. P. (2,000 B. C.) also was much better represented in area B of the site. Here, the culture sequence from this period was above the major Middle Archaic till, but historic period farming, tree farm activity, and artifact collecting have combined to destroy much of this. Overall, area B proved to be difficult to interpret, but this was compensated for in part by the excavation of more than 1,800 square feet (167 square meters). This large area aided in the location of less disturbed areas, particularly for the Paleoindian traditions.

Individual Excavation Units - Area B

This section describes the individual excavation units in area B shown in Figure 5.2. The detail in which individual units are described is based upon the nature of the field excavation, and the degree and depth of the laboratory analysis as outlined in Chapter 4. The units are described as encountered from the hill top proceeding west to the river. Very little of area B could be excavated as a large continuous unit. As a result of the discontinuous nature of the excavations, each unit is described, expanding upon the characteristics of deposit depth, artifact density, and features. The density of artifacts in area B varied greatly away from the ridge centerline, and this is clearly indicated in the data from these units. Plots of features from each level of each excavation unit are on the original excavation maps retained by NRS.

Excavation Unit 0/0

This 5 foot by 5 foot square was excavated in October 1993 in 10 levels below the plow zone. The 6 inch plow zone (soil zone 1) was mechanically stripped, and 9 levels of 2 inch thickness, and 1 level of 3 inch thickness were excavated. The excavated block was, therefore, 5 feet x 5 feet x 21 inches deep. Diagnostic artifacts were recovered in only levels 2, 3, and 4 and represented the Late Archaic and Middle Archaic periods. The total weight of all cultural lithic material from this unit was 56.58 pounds (25.72 kg) of which approximately 50% was fire cracked rock (FCR) hearth stones. Below level 5, FCR was not significant.

Table 5.28 presents a general analysis of all cultural materials from unit 0/0, and Table 5.29 describes formal artifacts. The finding of the six diagnostic projectile points in proper stratigraphic sequence suggests that levels 2, 3, and 4 of this excavation unit were relatively undisturbed. However, a single mortar was found in eight fragments from level 3 through level 5 which

Table 5.29. 44SX202, CACTUS HILL AREA B, SQUARE 0/0, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material
1	Projectile points (1): Savannah River/1/qte - broad blade.
2	Projectile points (1): Savannah River/1/qte - narrow blade.
3	Projectile points (2): Savannah River/1/qte, Halifax/1/qte; Biface fragments/3/qte; Utilized flakes/4/qte; Bifacial tools/2/qte; Mortar fragments/2/?; Flakes*: 1/green ss, 1/chert.
4	Projectile points (2): Guilford/1/qte, Morrow Mt. ?/1/qte; Edge used flakes/4/qte, Edge used flakes/4/qu; Mortar fragments/3/?; Bipolar cores/10/qu; End scraper-Side scraper/1/qu - pebble.
5	No projectile points; Edge worked tools/3/qu - roughly edged; Wedge/1/qu; Mortar fragments/3/?; Biface/1/qte - broken; Flakes*: 1/flint-like, 3/rhy.
6	No projectile points; Large pointed biface/1/qte; Bipolar wedge-like core/1/qte; Edge used flake/1/qte; Large cobble core (bipolar)/1/qu.
7	No projectile points; Biface/1/qte - thin, broken, Biface/1/rhy. - thin, broken; Cobble smoothing stone/1/qte; Flakes*: 1/argillite, 1/rhy., 1/rhy - speckled.
8	No projectile points; Flakes*: 1/black rhy., 1/chalcedony - flint-like, 1/green rhy.
9	No projectile points; Flakes*: 1/rhy., 1/chert.
10	Tabular scrapers/2/layered stone.

Notes: *Flakes other than quartz and quartzite.
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Excavation Unit 0/1

This 10 foot by 10 foot square was excavated in October 1993 in 8 levels below the plow zone. The 6 inch plow zone (soil zone 1) was mechanically stripped, and 8 levels of approximately 3 inch thickness were excavated. The excavated block was, therefore, 10 feet x 10 feet x 24 inches deep. The total depth of the deposit in this unit was 30 inches.

It was observed that at least 36 square feet of the 100 square feet of this unit had been disturbed by earlier digging by artifact collectors. A decision was made in the field to retain only ceramics, worked stone, and diagnostic artifacts from this greatly disturbed unit. Features were recorded only where it was clear that there was no disturbance. Four features were

Table 5.30. FEATURES, UNIT 0/1

Unit	Level	Feature #	Feature Description/location	Feature Size Orientation	Components and Associations
0/1	Level 3 - 4 Morrow Mt. II	0/1-3-F1	Surface hearth Northwest	27" x 23" x 3.5" circular	FCR Morrow Mt. II
0/1	Level 6 Morrow Mt. II	0/1-6-F1	Pit hearth Northwest	23" x 23" x (?) circular	FCR Morrow Mt. II
0/1	Level 6 Guilford ?	0/1-6-F2	Bottom (?) of pit hearth Southeast	31" x 22" x 3" (?) E-W orientation	Minor FCR Guilford
0/1	Level 8	0/1-8-F1	Bottom (?) of pit hearth {continuation of feature 0/1-6-F1(?)} Northwest	30" x 23" x 3" E-W orientation	FCR Morrow Mt. II (?)

indicates that there was some disturbance from pits (features) or external sources. Still, the fact that FCR was not present below level 5 would add some credibility to the argument for the integrity of this part of the cultural deposit. One edge (about 1 to 2 square feet) of this square had been disturbed by a pit dug to the southeast by artifact collectors.

One feature (0/0-3-F1), a very tight circular surface hearth with 37 FCR and dimensions of 24 x 26 x 2 inches deep was encountered undisturbed in level 3 with a narrow blade Savannah River point. The lowest level containing any significant number of artifacts was level 7. Excavation unit 0/0 appeared to be as undisturbed, and with as high a degree of stratigraphic integrity as any of the squares in area B. Unfortunately, the relatively few diagnostic artifacts, and the possible presence of undetected pits, precluded a detailed lithic analysis of this unit.

Table 5.28. 44SX202, CACTUS HILL AREA B, ANALYSIS OF SQUARE 0/0

Level	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comments
1	14.5	2..3	407 1.76	78 0.33	0.1	--	--	Late Archaic
2	7.5	3.8	712 2.88	172 0.72	0.1	--	--	Late Archaic
3	24.5	13.5	1,308 4.8	297 1.2	5.0	--	--	Middle Archaic and Late Archaic; fragments from same mortar levels 3, 4 and 5
4	9.5	2.4	349 1.6	111 0.4	3.0	--	1.5	Middle Archaic; large pieces of mortar, many bipolar cores
5	6.0	0.9	356 1.4	141 0.6	3.0	--	--	mortar fragments
6	3.0	0.1	280 1.1	120 0.47	0.25	--	0.40	No diagnostic artifacts
7	1.16	0.1	82 0.3	20 0.1	0.5	--	--	No diagnostic artifacts
8	0.28	--	40 0.14	9 0.06	0.1	--	--	No diagnostic artifacts
9	0.09	--	39 0.15	7 0.04	--	--	--	No diagnostic artifacts
10	0.25	--	16	3	0.20	--	--	No diagnostic artifacts
Totals	56.78 (25.80 kg)	23.1 (11.55 kg)	3,589 14.13 (6.42 kg)	955 3.92 (1.78 kg)	12.25 (5.56 kg)	Not recorded	1.9 (0.86 kg)	# Flakes=4,544 Flakes wt=18.05 lb. (8.20 kg)

Notes Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms

recognizable and recorded as noted in Table 5.30. This excavation unit appeared to have only a moderate degree of stratigraphic integrity as demonstrated by the projectile point distribution in Table 5.31 and Appendix A. Levels 1 through 4 contained intermixed Late Archaic and Middle Archaic material, and levels 6 and 7 contained intermixed Middle Archaic and Early Archaic material. The retained artifacts from excavation unit 0/1 are recorded in Table 5.31. This excavation unit provided some information on Middle Archaic features, indicated deposit depth, and provided spatial data concerning site use by Late, Middle, and Early Archaic cultures.

Table 5.31. 44SX202, CACTUS HILL AREA B, SQUARE 0/1, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material
1	Projectile points (3): Slade/1/qte; Guilford/1/qte; Morrow Mt. II/1/qte; Biface fragments/5/qte; Williamson chert flake/1/used, edge worn; Stony Creek cord marked pottery/2/small pieces.
2	Projectile points (3): Halifax/1/qte; Guilford/2/qte; Biface fragments/4/qte; Edge worked flake/1/qte; Pointed side scraper/1/qte; Flakes*: 1/chert, 1/green silicified slate (ss).
3	Projectile points (3): Savannah River/1/qte; Guilford/1/qte; Morrow Mt. II/1/qu; Biface fragments/9/qte; Biface/1/qte; Biface-small/1/qu; Flakes*: 1/dark rhyolite, 1/green ss.
4	Projectile points (3): Morrow Mt. II/1/qte; Morrow Mt. II/1/qu; Morrow Mt. I/1/qte; tip/1/ss; Clovis-like graver/1/FGC; Edge worked pointed flake/1/qte; Biface fragments/6/qte; Edge worked flake or core fragments/2/qte; Flakes*: 1/green ss, 1/crystal quartz.
5	Projectile point: serrated tip/1/qte; Hammerstone fragment/1/matches fragment from level 6; Edge worked flake/1/qte, /1/qu; Flakes*: 2/green ss.
6	Projectile points (4): Guilford/1/qte; Morrow Mt. II/2/qte; Palmer/1/qte; Biface fragments/4/qte, Side scrapers/2/qte; Large core/1/qte; Hammerstone fragment/1/matches fragment from level 5; Flakes*: 1/green ss, 1/blue rhyolite.
7	Projectile points (1): St. Albans/1/rhyolite; broken tip/1/green ss; Side scrapers/2/qte; Small thin biface/1/qte; Biface fragments/2/qte; Flakes*: 3/burned jasper, 2/green ss, 1/blue rhyolite, 1/speckled rhyolite.
8	Snapped graver (Early Archaic)/1/green rhyolite.

Notes: *Flakes other than quartz and quartzite.
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Excavation Units 0/4, 3/4 and 3/2

These three units, each approximately 5 foot by 5 foot square, were salvage excavations made on an *ad hoc* basis in March and April 1992. Unit 0/4 was excavated in five levels of approximately 3 inch thickness, below an 8 inch plow zone (soil zone 1). The total depth of the unit was 24 inches. Unit 3/4 was excavated in 3 levels of approximately 4.5 inch thickness, below a 6 inch plow zone. The total depth of the unit was 20 inches. Unit 3/2 was excavated in 4 levels of approximately 4 inch thickness, below a 6 inch plow zone. The total depth of this unit was 22 inches.

These three excavations were located between and adjacent to overlapping pits dug by artifact collectors. Only the diagnostic artifacts will be analyzed for adjacent salvage excavations 0/4, 3/4 and 3/2. Appendix A presents these results in the individual excavation unit tables. All units were greatly disturbed and there was a mix of Late Paleoindian through Middle Woodland period diagnostic projectile points throughout the depth of the deposits. This general area of the site was heavily occupied, and this fact partly accounts for the degree of mixing or "till" of the deposits.

The three squares represent approximately 75 square feet, and 39 diagnostic projectile points were recovered from this small area. Our records indicate that the total weight of all cultural materials from the three squares was 221 lb. (100.5 kg) and included numerous hearth stones, flakes, broken bifaces, and edged flakes. It was observed that fire cracked rock (FCR) extended to the bottom of the cultural deposits indicating extensive disturbance. These excavation units were valuable in providing spatial data for

diagnostic projectile points indicating the areas occupied by groups of Late Paleoindian through Middle Woodland age. Unfortunately, the degree of till in this area, as well as the modern disturbances, preclude any other meaningful observations.

Excavation Unit 0/5

This 10 foot by 10 foot square was excavated in October 1993 in 10 levels below the plow zone. The 6 inch plow zone (soil zone 1) was mechanically stripped, and 10 levels of average 2 to 3 inch thickness were excavated. Level 1 and part of level 2 represented soil zone 2 and the remaining levels were clearly soil zone 3. The excavated block was 10 feet x 10 feet x 22 inches deep. Therefore, the total depth of the deposit in this unit was 28 inches.

About 5 square feet of one corner of the square to the northwest had been disturbed by artifact collectors, but otherwise this square appeared to be relatively free of modern disturbances. Diagnostic artifacts were recovered in levels 1, 3 through 6, and level 9. No diagnostics were recovered in levels 2, 7, 8, or 10.

The 32 diagnostics projectile points represented the Late Archaic, Middle Archaic, Early Archaic, and Paleoindian periods. This excavation unit produced 286.3 lbs. (130.1 kg) of culturally associated lithic materials, including 18,071 quartzite and quartz flakes, with quartzite representing 86.7% of the total.

The projectile point analysis indicates a mixture or "till" of Late Archaic and Middle Archaic material in levels 1 through 5. Level 6 and deeper primarily represent the Early Archaic and Paleoindian periods with Middle Archaic Morrow Mountain I pit hearths penetrating into level 6. Hearth stones, or FCR, are common into level 7, indicating some pit hearths and mixing also into this level.

Excavation unit 0/5 clearly indicated small areas of undisturbed working surfaces in levels 5 and 6 where projectile points and tools were associated with debitage from the same occupation. The greater occupation and till in levels 1 through 4 precluded similar observations. Levels 1 through 4 were so intermixed that individual hearths could not be recognized, and there was only a dense, general scatter of FCR.

Level six produced the bottom of two circular pit hearths, with FCR, which were near the north wall of the square. These features (0/5-6-F1 and F2) were approximately 16 inches in diameter and the remaining depth was 3 inches. They probably initiated from levels 2 through 4, and both hearth areas were associated with a fire damaged Morrow Mountain I projectile point.

A weathered jasper fluted point (Middle Paleoindian?) was found in level 6, and a Palmer point and a fire damaged Decatur point also were recovered from this level. The two diagnostic artifacts found below this in level 9 (a Savannah River point base and a Fort Nottoway point fragment) drifted into the lower level through disturbances. The Fort Nottoway point fragment apparently was in a pit of that period, but the broken Savannah River point was found in the area disturbed by artifact collectors on the north edge of the excavation unit. Level 10 produced a small chert polyhedral blade core and a similar chert core blade, possibly the oldest artifacts in excavation unit 0/5. Tables 5.32 and 5.33 describe the artifacts recovered from unit 0/5.

Table 5.32. 44SX202 CACTUS HILL, AREA B, ANALYSIS OF SQUARE 0/5

Level	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifacts Weight (lb.)	Pebbles and Cobbles (lb.)	Cores (nonbifacial) (lb.)	Comments
1	16.5	7.2	2,016 7.2	230 0.8	1.0	0.2	0.2	Middle Archaic artifacts
2	31.5	16.5	2,324 8.3	204 0.7	4.0	1.0	1.0	No diagnostic artifacts
3	73.5	50.0	2,080 11.0	165 1.0	5.0	4.0	2.0	Middle Archaic and Late Archaic
4	54.5	38.25	1,523 5.3	212 1.5	4.5	2.0	3.0	Many qte flakes, fire reddened; much shatter; very little bipolar flake reduction; Middle Archaic and Late Archaic artifacts
5	40.0	8.0	3,542 19.0	746 4.7	4.0	3.5	1.0	Many bipolarized pebbles, bipolar core fragments and shatter, also many smaller size flakes; Early Archaic and Middle Archaic artifacts
6	29.5	4.25	1,493 6.5	275 1.5	6.0	3.0	8.0	Paleoindian, Early Archaic, Middle Archaic
7	24.0	3.0	1,807 7.0	390 2.2	6.5	1.0	4.0	No diagnostic artifacts
8	10.0	0.25	430 3.5	76 0.5	3.0	1.0	2.0	Modern disturbed areas, and downdrift from Early Archaic activity observed in this level.
9	5.0	0.25	240 2.0	80 0.5	1.0	0.5	0.5	All flakes very small, 1" (25 mm) or less
10	1.8	0.15	213 0.89	25 0.11	0.15	0.5	0.2	Polyhedral blade core and core blade - Early Paleoindian (?)
Totals	286.3 (130.1 kg)	127.9 (58.1 kg)	15,668 70.69 (32.13 kg)	2,403 13.5 (6.14 kg)	35 (15.9 kg)	16.7 (7.59 kg)	21.9 (9.95 kg)	Total flakes=18,071 Flakes wt=84.19 lb. (38.27 kg) Qte=86.7%

Notes: Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms

Table 5.33. 44SX202, CACTUS HILL, AREA B, SQUARE 0/5, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material
1	Projectile point (1): Guilford/1/qu; Bifaces/2/qte - broken; Flakes*: 1/jasper, 1/weathered Williamson chalcedony, 2/weathered rhy, 1/porous chalcedony, 2/chert.
2	No diagnostic projectiles points; Edge used flakes/3/qte; Biface/1/qte - thin, oval; Biface fragments/2/qte; Flakes*: 1/cobble chert, 2/jasper, 1/pink chert - heated, 2/ Williamson chert.
3	Projectile points (7): Small stemmed/1/qte; Rowan/1/qte; Guilford/4/qte; Morrow Mt. II/1/qte; Tip/1/rhy; Biface fragments/8/qte; Edge worked flakes/8/qte; Red paint stone/6/iron oxide (ore) - burned, fragments; Flakes*: 8/argillite - weathered, 1/porous chalcedony, 12/green ss, 2/speckled rhy, 1/cobble chert, 6/fired chert, 1/Williamson chalcedony.

Table 5.33. 44SX202, CACTUS HILL, AREA B, SQUARE 0/5, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material
4	Projectile points (10): Small stemmed/1/qte; Slade/2/qte; Halifax/1/qu; Guilford/2/qte; Morrow Mt. II/2/qte; Morrow Mt. I/1/arg; LeCroy/1/qu; Bifaces/2/qte; Hammerstone/1/ ?; Flat slab grinding stone/1/ ? - oxide stained; Red paint stone/7/iron oxide (ore) - burned, fragments; Edge used flakes/4/qte; Flakes*: 3/cobble chert, 2/fibrous chalcedony.
5	Projectile points (7): Halifax/1/qte; Morrow Mt. II/3/qte; Morrow Mt. I/1/argillite; Kirk Stemmed/2/qte; Biface/1/qte; Edge worked flakes/5/qte; Chipped ax/1/greenstone-like; Wedges or bipolar cores/3/qu; Red paint stone/4/burned iron oxide (ore) - fragments; Snapped flake graver/1/green ss; Snapped flake graver/1/chalcedony; Flakes*: 1/chalcedony, 1/speckled rhy, 4/porous chalcedony, 3/cobble chert, 5/green ss.
6	Projectile points (5): Morrow Mt. I/1/qte; Morrow Mt./1/chert; Decatur/1/chert; Palmer/1/qte; Fluted point/1/jasper, tip/1/chert; Biface/1/qte; Hammerstones/2/?; Red paint stone/1/iron oxide (ore) - burned and rubbed; Flakes*: 5/chert, 7/rhy, 4/green ss.
7	No diagnostic projectile points; Bifaces/2/qte; Unifacial flake knife/2/qte; Unifacial worked flakes/16/qte; Flat ground stone/1/dibase; Unifacial side scraper/2/qte; Anvil stones/2/?; Smoothing stone/1/dibase; Large core choppers/3/qte; Hammerstone/1/qte; Flakes*: 8/chert, 6/rhy, 6/green ss, 5/jasper, 6/argillite, 10/speckled rhy, 2/crystal qu, 1/Bolster's Store chert - burned, 1/Bolster's Store green chert, 4/weathered yellow rhy.
8	No diagnostic projectile points, Tip/1/qte - deeply serrated; Biface tips/3/qte; Large side scraper/1/weathered metavolcanic material; Anvil stone/1/qte; Smoothing stone/1/qte; Unifacial flake knives/4/qte; Flakes*: 8/green ss.
9	Projectile points: Savannah River/1/qte; Fort Nottoway/1/qte - small fragment (both disturbed into this level); Flakes*: 3/green ss, 3/rhy, 9/speckled rhy.
10	No diagnostic projectile points; Polyhedral blade core/1/chert; Polyhedral blade/1/chert; Edged tool fragment/1/qte; Flakes*: 1/fibrous chert, 1/black rhy, 3/blue chert, 1/jasper, 5/speckled rhy, 1/yellow rhy, 2/crystal quartz.

Notes: *Flakes other than quartz and quartzite.
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Excavation Unit 2/7

This 10 foot by 10 foot square was excavated over a three day period in March 1992 in 6 levels below the plow zone. Areas to the east, north, and south of this square were heavily damaged by pits from artifact collecting at the time this square was excavated. Small areas on the south and east edge of this square had been disturbed, which represented about 8 square feet. For unit 2/7 the 8 inch plow zone (soil zone 1) was removed by hand and 5 levels of approximately 2.5 inch thickness and one level of 3.5 inch thickness (level 6) were excavated. The excavated block was therefore 10 feet x 10 feet x 16 inches. The total depth of the deposit in this unit was 24 inches. The original excavation notes divided level one into two sublevels each 2.5 inches thick. In evaluating the excavated material in the laboratory, level 1B was redesignated as level 2 and each successive level was renumbered accordingly.

This heavily occupied block produced diagnostic artifacts in each level and a total of 32 identifiable hafted bifaces. The total weight of all culturally associated lithic materials was 250.5 lbs. (113.9 kg) of which 109 lbs. (49.5 kg) was fire cracked hearth stone (FCR). There was no significant amount of FCR below level 4. There was a total of 32,422 flakes of quartzite and quartz in excavation unit 2/7 of which 88.0% was quartzite.

An analysis of the diagnostic artifacts revealed that level 1 (soil zone 2) contained Middle Woodland and Late Archaic material; level 2 (soil zone 3 as are all successive levels) contained Late Archaic and Middle Archaic material; level 3 contained Late Archaic, Middle Archaic, and Early Archaic material; level 4 contained, Middle Archaic and Early Archaic material; level 5 contained Early Archaic material; and level 6 contained Paleoindian artifacts. While the excavated depth of cultural material in this unit was shallow (16 inches), the cultural stratigraphy in this unit was good for area B of the Cactus Hill Site, and suggested that all mixing probably was associated with the long and intensive use of this area of the site. The upper level and very lowest two levels of the square were relatively undisturbed. As was noted for adjacent excavation unit 0/5, levels 1

Table 5.35. 44SX202, CACTUS HILL AREA B, SQUARE 2/7, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
1	Projectile points (3): Large triangular/1/qte, Tapered stemmed/1/qte, Slade/1/qte; Bifaces/2/qte - wide, broken tips; Bipolarized cobble/1/qu; Roughly edged flake/1/qu; Flakes*: 1/heated red jasper, 1/heated Williamson chert, 1/weathered Mitchell chert, 1/yellow rhy - snapped edges.
2	Projectile points (7): Perkiomen/1/rhy, Small stemmed/1/qu, Savannah River - broad/2/qte, Slade/1/qte, Halifax/1/qte, Guilford/1/qu, tip/1/qte; Bifaces/16/qte, 2/qu - mostly thick and crude early stage; Flakes*: 2/chert, 1/jasper, 4/ss, 1/rhy, 1/arg, 1/yellow rhy.
3	Projectile points (10): Small stemmed/1/qte, Halifax/1/qte, 1/qu, Morrow Mt. II/2/qte, Small Stanley-like/1/qte, Kirk serrated/1/qte, Fort Nottoway/1/qte, Kirk Corner-Notched/1/qte, 1/rhy, Tip/1/153; Bifaces/12/qte, 2/qu - most wide, thick crude early stage; Chopper/1/qte, Side scraper/1/rhy, Edge worked flake/1/green ss; Cache blades/5/qte, 1/qu - excavated together - thin, wide triangular, avg. 50 mm long; Red paint stone/2/burned iron oxide (ore) - fragments; Flakes*: 6/chert - dark, 5/yellow chert, 8/jasper, 6/green ss, 1/gray arg, 1/green arg, 1/speckled rhy, 2/schist.
4	Projectile points (7): Halifax/1/qte, Guilford/1/qte, Morrow Mt. I/1/arg, Small Stanly-like/1/qu, Kirk Serrated/1/qte, 1/rhy, St. Albans/1/qte; Bifaces/9/qte, 4/qu; Thin Biface/1/qte; Serrated biface/1/qte; Bipolar cores/3/qu; Pecked tool fragment/1/greenstone; End scraper/1/jasper; Large side scrapers/2/qte; Drill tip/1/qu; Side scrapers/3/qte, 1/green ss; Edged flakes/3/qte; Edge used flakes/4/qte; Chopper/1/qte; Smoothing stone/1/qte; Abrading stone/1/sandstone; Red paint stone/1/burned and ground iron oxide (ore); Yellow paint stone/3/unheated iron oxide (ore) - small pieces; Flakes*: 4/yellow chert, 7/red jasper, 1/yellow jasper, 1/silicified wood, 1/translucent chalcedony - grainy, 2/speckled rhy, 8/translucent black rhy, 13/green ss, 1/gray coarse rhy, 1/purple speckled chert-like qte.
5	Projectile points (4): Kirk stemmed/2/qte, Kirk S-N/1/green ss, Palmer/1/Bolster's Store chert - green; Bifaces/10/qte, /1/qu, Thin biface/1/qte; Chopper/1/qte; Edge used flakes/6/qte, Wedge/1/qte; Tabular scraper/1/sandstone; End scrapers/1/red jasper, 1/qte; Side scrapers/1/yellow jasper, 1/fibrous chert, 1/Williamson chert; Red paint stone/1/burned iron oxide (ore); Large core fragment/1/gray silicified wood; Flakes*: 5/Mitchell chert, 5/jasper, 1/Bolster's Store green chert, 2/mottled dark chert, 3/black rhy, 2/speckled rhy, 2/fine grained chert-like qte
6	Projectile points (1): Early triangular/1/rhy; Polyhedral core/1/qte; Core blades/4/qte; Edged flake/1/qte; Slab-grinding stone/1/sandstone; Flakes*: 1/rhy.

Notes: *Flakes other than quartz and quartzite.
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Excavation Units 1/9 plus 2/9

These units were excavated together as a single unit 15 feet by 10 feet, and they were part of a larger block measuring 25 feet by 20 feet excavated in October 1993. As shown in Figure 5.36c, all 500 square feet of this larger block, made up of squares 1/9, 2/9, 4/9 1/11, 2/11, and 4/11, were under excavation over the same three week period, but by different volunteer crews. Squares 1/11 plus 2/11 will be considered together, as are 1/9 + 2/9, and squares 4/9 and 4/11 will be considered separately.

Excavation block 1/9 + 2/9 received the greatest detailed field attention given to any of the Cactus Hill area B excavation units. A very impressive total of 51 diagnostic projectile points/hafted bifaces was recovered from this 150 square foot excavation. The 8 inch plow zone (soil zone 1, Figure 5.1) was removed mechanically, and the remaining 22 inch deep cultural deposit was excavated in seven levels. The total depth of cultural deposits in this unit was 30 inches.

Level 1, which contained soil zone 2, was approximately 3 inches in depth and produced artifacts of the historic period (ca. 1701 to 1750), Middle Woodland, Transitional Late Archaic, and Late Archaic periods. The concentration of debitage and FCR was very heavy and continuous across the unit. No individual features could be recognized.

Level 2, soil zone 3, was excavated in units 2A and 2B, each approximately 2.5 to 3 inches thick. The density of debitage and FCR was almost as heavy in this level as in level 1, but the mixture of cultural materials was from the Late Archaic through Early Archaic periods. Still, an analysis of the diagnostic artifacts (Appendix A) revealed that most of the projectile points were of Middle Archaic age with 2 points from the later part of the Early Archaic period. Only three of the points were of Late Archaic

through 4 of unit 2/7 produced such a heavy concentration of FCR that individual features were very difficult to distinguish. One circular hearth was observed in the northeast area of level 2 which contained two fire damaged quartzite Savannah River broad spears. The feature (2/9-2-F1) was a circular surface hearth filled with 28 pieces of FCR and the dimensions were 21 x 26 x 3 inches deep. There were several pieces of calcined bone (one deer toe bone) remaining among the hearth stone, but carbonized wood and nut shell were absent from the feature.

Level 4 produced small bipolar cores and shatter which probably were associated with the Morrow Mountain I period. While level 5 produced only Early Archaic projectile points, one area of the square, near the northwest corner of unit 0/5, produced several Clovis-like unifacial tools including end scrapers and side scrapers. Level 6 produced one of the few Early Paleoindian (?) triangular points from the site, a polyhedral blade core, and several core blades. Square 2/7, therefore, was identified as one of the areas of the site where there was Paleoindian occupation. It is extremely unfortunate that much of the adjacent area was destroyed without recovery of data. Tables 5.34 and 5.35 describe the artifacts recovered from unit 2/7.

Table 5.34. 44SX202, CACTUS HILL, AREA B, ANALYSIS OF SQUARE 2/7

Level	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Pebbles and Cobbles (lb.)	Cores (nonbifacial) (lb.)	Comments
1	20.75	15.5	1,140 4.2	152 0.5	0.25	0.3	--	Late Archaic and Middle Woodland
2	51.5	28.5	4,016 14.7	351 1.3	2.0	5.0	--	Middle Archaic and Late Archaic
3	70.4	32.0	8,324 26.5	1,371 4.0	2.2	5.7	--	Early Archaic, Middle Archaic and Late Archaic
4	65.5	30.0	8,140 24.0	1,162 3.5	3.5	4.0	0.5	Early Archaic and Middle Archaic
5	37.75	3.0	9,469 25.0	1,270	2.75	2.0	1.0	Early Archaic and Paleoindian
6	4.5	0.063	984 2.85	43 0.15	0.44	1.0	0.25	Paleoindian - Early triangular biface, core blades, polyhedral blade core
Totals	250.5 (113.87 kg)	109 (49.5 kg)	32,073 97.25 (44.20 kg)	4,349 13.45 (6.11 kg)	11.14 (5.06 kg)	18 (8.18 kg)	1.75 (0.80 kg)	Total flakes =36,422 110.7 lbs. (50.32 kg) 88.06% qte

Notes: Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms

age. Of the total of 25 diagnostic points from this level, 20 represented the Middle Archaic and some were associated with circular pits filled with FCR. See Appendix A for the sequence of diagnostic projectile points from units 1/9+2/9.

Only four pit hearths could be seen clearly, and these were oriented north to south across the square, with centers at approximately 1 foot, 8 feet, 11 feet, and 14 feet from north. These features were 16, 15, 15, and 19 inches in diameter respectively, and extended into levels 4 to 5. The traditions associated with the pit hearths appeared to be Halifax and Morrow Mountain. These features were recorded as 1/9+2/9-2-F1 through F4 and are shown in Figure 5.37.

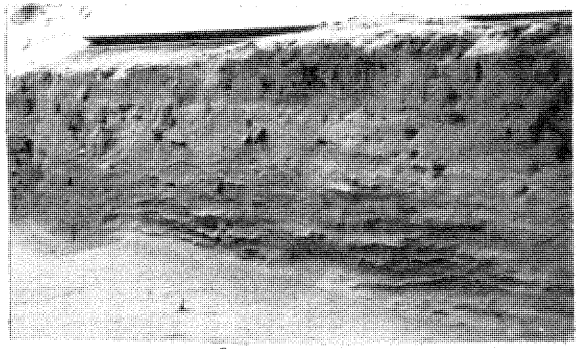
Level 3, also soil zone 3 (as were all succeeding levels), was only 1.5 to 2.0 inches in thickness and produced the highest density of debitage and a fairly heavy concentration of FCR. This level produced 11 projectile points which were divided as 6 Early Archaic and 5 Middle Archaic. There was significant till in this level with artifacts of Middle Archaic through apparent Paleoindian age intermixed. No features could be distinguished except the four pit hearths which originated in level 2. Most of the hearth stone (FCR) was randomly scattered across the level and appeared to have drifted downward from levels 1 and 2.

Level 4 was 2 inches in thickness and represented the last level in which any significant FCR was encountered, and this was associated mostly with the pit hearths. Debitage was still fairly heavy in level 4 and apparently primarily represented the Early Archaic, but some of the debitage and the FCR was drift from Middle and Late Archaic periods. Significantly, three of the seven projectile points were Palmers, and the other four points represented different types from the Middle and Late Archaic periods (see Appendix A). Level 4 produced a wide range of early tool types including gravers, wedges, end scrapers, side scrapers, and edge worked flakes. Some of these are probably of Paleoindian age, but most appear to be associated with the early corner notched point (Palmer) occupation of the site.

Level 5, excavated as three 2 inches deep units (a, b, and c), produced only two large fragments of FCR, and two associated Middle Archaic projectile points in bottoms of pit hearths. Much of the debitage, the tools, and the diagnostic projectile points from this level represented the Palmer period of the Early Archaic, or the fluted point traditions of the Paleoindian period. This was particularly evident in several areas of relatively undisturbed working surfaces of the Palmer and fluted point periods. Figure 5.36 (a-e) shows square 2/9 under excavation in October 1993, and Figure 5.38 shows the Palmer and Paleoindian artifact distribution across units 1/9, 2/9, 1/11, and 2/11, as well as parts of 2/7, 0/5, and 4/9. The primary working surfaces which remained only as remnants were small areas and generally no more than 25 to 50 square feet. The most common artifacts on the Paleoindian working surface were fluted point fragments, side scrapers, utilized flakes, edge worked flakes, and gravers (see Figure 5.39). End scrapers were fairly rare as were biface reduction flakes and cores.

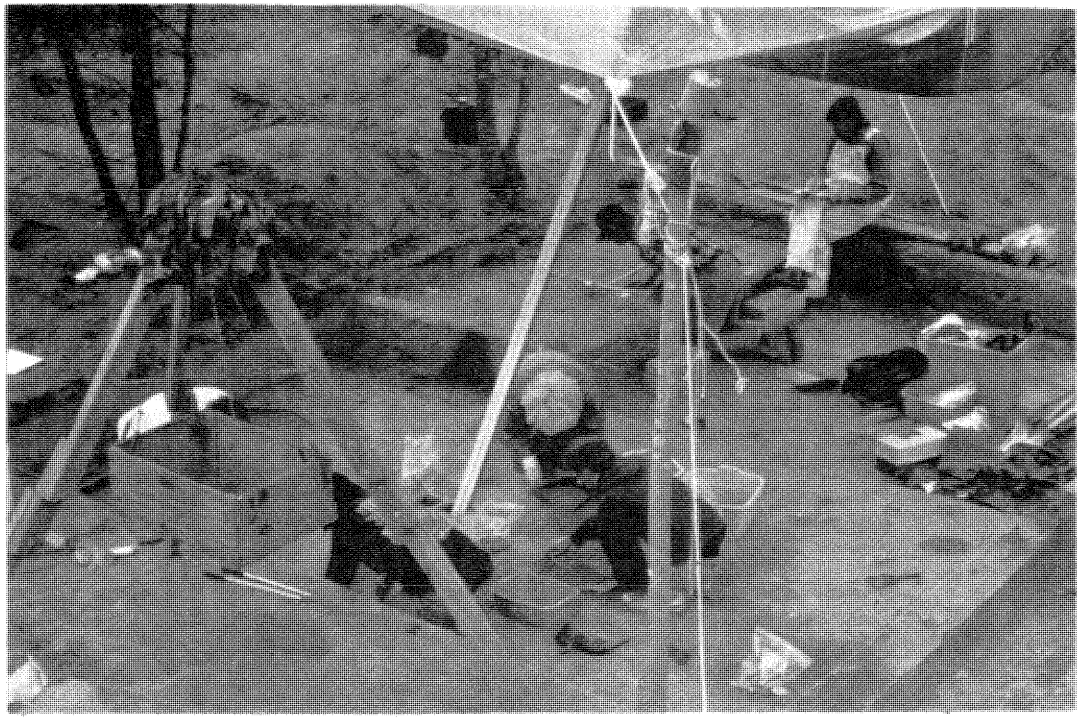
A wider range of tools was found associated with the Palmer working surfaces including Palmer points, side scrapers, end scrapers, snapped flake gravers, bifaces, choppers, many biface reduction flakes, and cores (see Figure 5.40). Carbon samples for 14C dating were removed from the bottom and walls of level 5 in unit 2/9 in an attempt to determine the general age of the level. Several hundred wood charcoal samples recovered on a grid basis across the floor of levels 5, 6, and 7 of unit 2/9 were submitted for identification. A small faunal assemblage, primarily calcined bone, also was collected from unit 2/9 for identification. The results of all of the dating and identification work are presented in Chapter 6.

Level 6 of unit 1/9+2/9 was 2 to 3 inches thick and was defined as below the general Palmer and fluted point working surfaces. This level produced only two small fragments of FCR and very few flakes. The western edge of unit 1/9 produced one Palmer point which had drifted below level 4 or 5. The general area of the fluted point cluster produced a few small chert flakes, a worked rhyolite flake, and a side scraper and wedge of quartzite. Directly under the center of the fluted point tool cluster, to the northwest of the square, a hearth-like scatter of a few fragments of wood charcoal over an area of 12 by 16 inches by no more than 1 inch deep was encountered. This scatter was designated feature-1(2/9-6-F1) of level 6, and is shown in Figures 5.37(top) and 5.41C. The only artifacts associated with this feature were 7 quartzite flakes and three quartzite core blades.



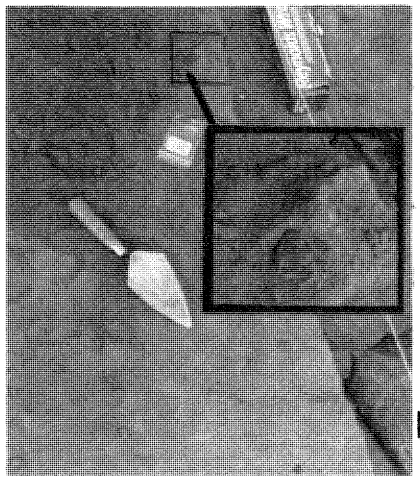
A

B



C

E



D

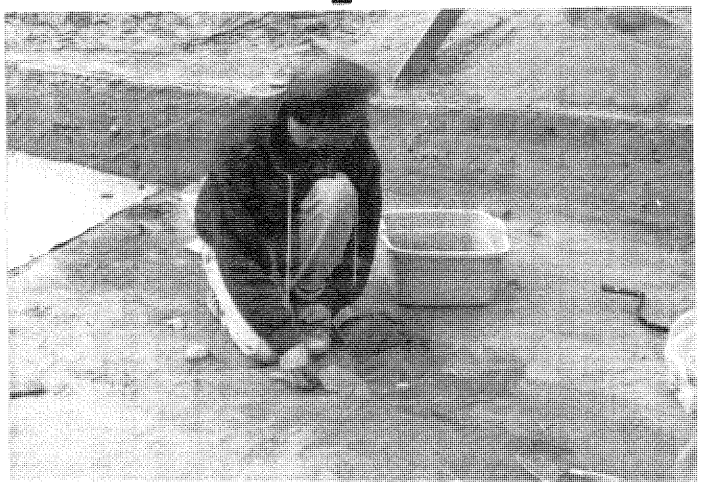


Figure 5.36.

A. Lamellar banding east wall of square 2/9, area B.

B. Removing balk between squares 1/9 and 1/11.

C. Squares 1/9, 2/9 (foreground) , and 1/11 and 2/11 (background).

D. Fluted point tip in situ, square 2/9.

E. Excavating across the Clovis level 5, square 2/9 area B.

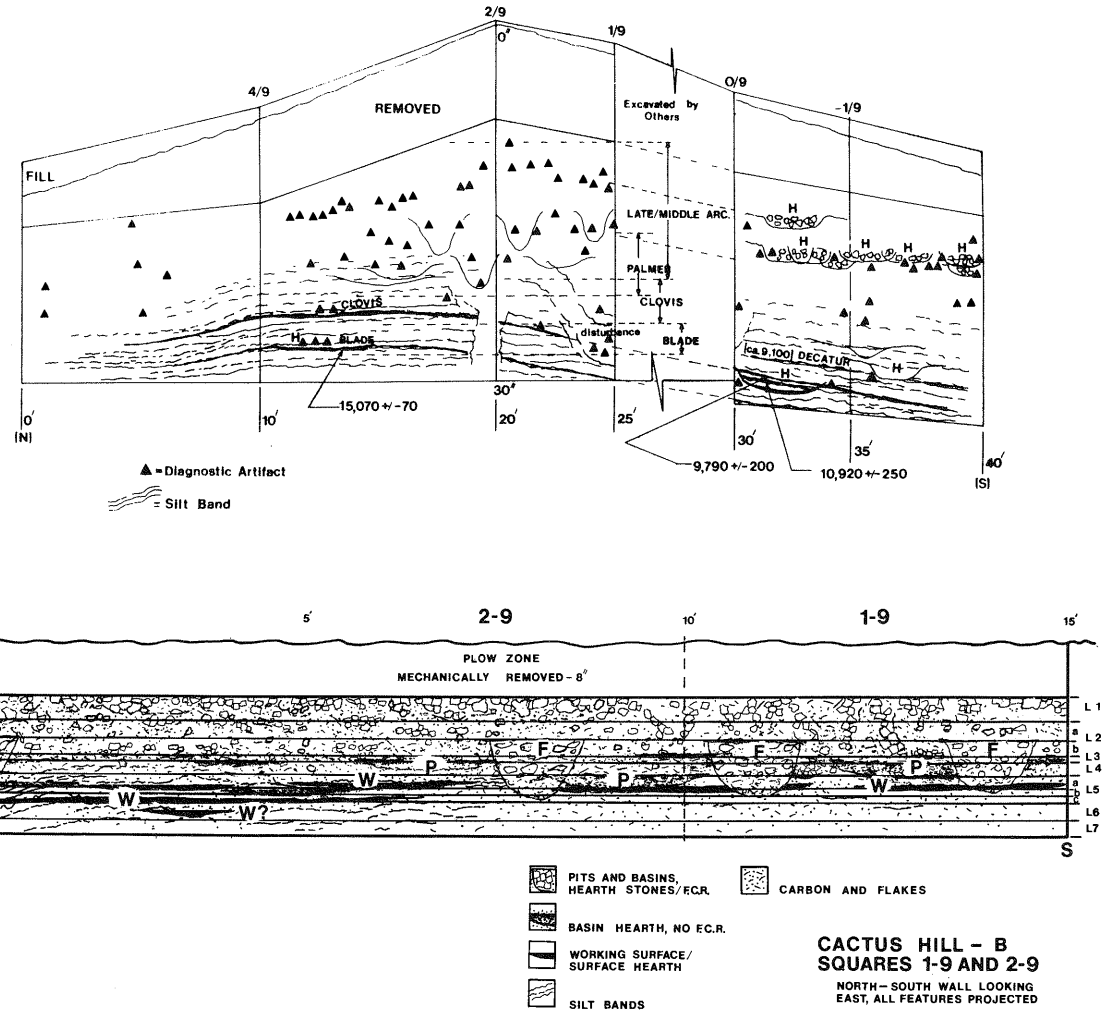


Figure 5.37. Top, excavation units 1/9 + 2/9 on Cactus Hill (October 1993), shown in relation to adjacent units 4/9, 0/9, and -1/9 with compressed horizontal scale; Clovis and possible pre-Clovis levels are indicated. Bottom, features 1/9+2/9-2-F1 through F4 (denoted by F), possible features (P), and working surface locations(w) in excavation units 1/9+2/9; features, possible features, and working surfaces, are projected to the east wall, looking through the excavation units from the west.

The charcoal from this cluster was submitted for identification and then dating. The wood charcoal was white pine (McWeeney, Appendix D (1)), and this dated 15,070 ±70 B. P. These results are presented in more detail in Chapter 6. The core blades were similar to the examples recovered from the lower levels of excavation units 0/5 and 2/7, and salvage excavations B and C excavated in 1994. Most of these artifacts are shown in Figure 5.42.

Level 7 was the last formal level in units 1/9+2/9 and was 2 inches in depth. This level produced three projectile points, all in the most southern area of unit 1/9 near the wall. The points, a Middle Archaic type and two Early Archaic types apparently drifted into this lower level from disturbances. It should be noted that these artifacts were not close to the major fluted point working surface. The north end of the square produced several artifacts including a side scraper of cobble rhyolite, a graver of Mitchell chalcedony, and a piece of rubbed (burned red) iron oxide paint stone. These artifacts are apparently of Early Archaic or Paleoindian age, and the chalcedony graver is typical of this artifact type in assemblages of the fluted point traditions. The general area of the fluted point and Palmer working surfaces in unit 2/9 was excavated an additional 12 inches in depth, but this produced no additional artifacts, and no hearth features.

The geology of unit 2/9 was investigated by use of a wall profile as shown in Figures 5.36 and 5.41 which specifically examined the integrity of the lamellar banding of the deposit. It was determined that the iron rich silt bands were present but broken and missing in many areas. This would suggest disturbances in the deposit. The bands, which (greatly simplified) represent moisture/dry-out zones in the soil, also appear to reflect slopes and possibly old surface contours. The lamellae of Figure 5.41b suggest that the slope in the Paleoindian period rapidly dropped off to the north approximately at the line between our squares 2/9 and 4/9. In simple terms, this area seems to have been the edge of an old terrace. This might explain the high density of Paleoindian and Early Archaic material just beyond (north of) the edge of square 2/9 and the sudden disappearance of artifacts of this period in the north end of square 4/9.

Excavation units 1/9+2/9 produced a total of 433.46 lbs. (197 kg) of culturally associated lithic materials, of which 182.2 lbs. (83.1 kg) was fire cracked hearth stones. There were 62,158 flakes and shatter fragments of quartzite and quartz, of which 88.4% were quartzite. The total weight of this debitage was 212.8 lbs. (96.7 kg). This excavation unit was one of the most interesting areas examined on Cactus Hill. It is unfortunate that so much of this area was heavily utilized and "tilled" throughout the Middle and Late Archaic periods. Otherwise, there may have been much more information to be derived from a detailed analysis of the debitage from each level of the excavation, and more datable features may have been preserved.

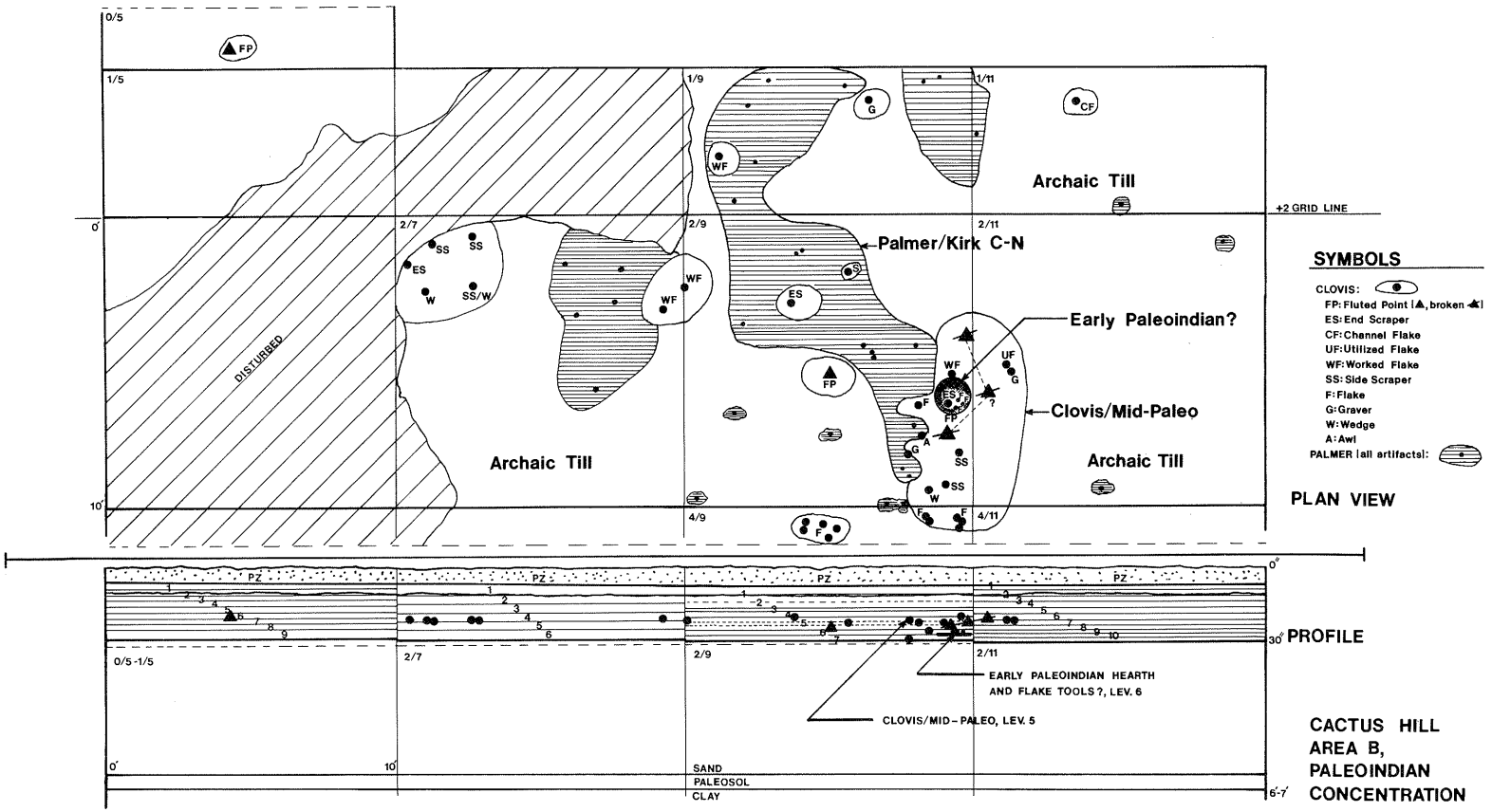


Figure 5.38. Plan and profile views of Paleoindian use areas in units 1/9, 2/9, 4/9, 1/11, 2/11, 0/5, and 2/7 of area B of the Cactus Hill Site. Also shown in plan view are Palmer use areas. Locations of artifacts indicated by letter symbols are of Paleoindian age.

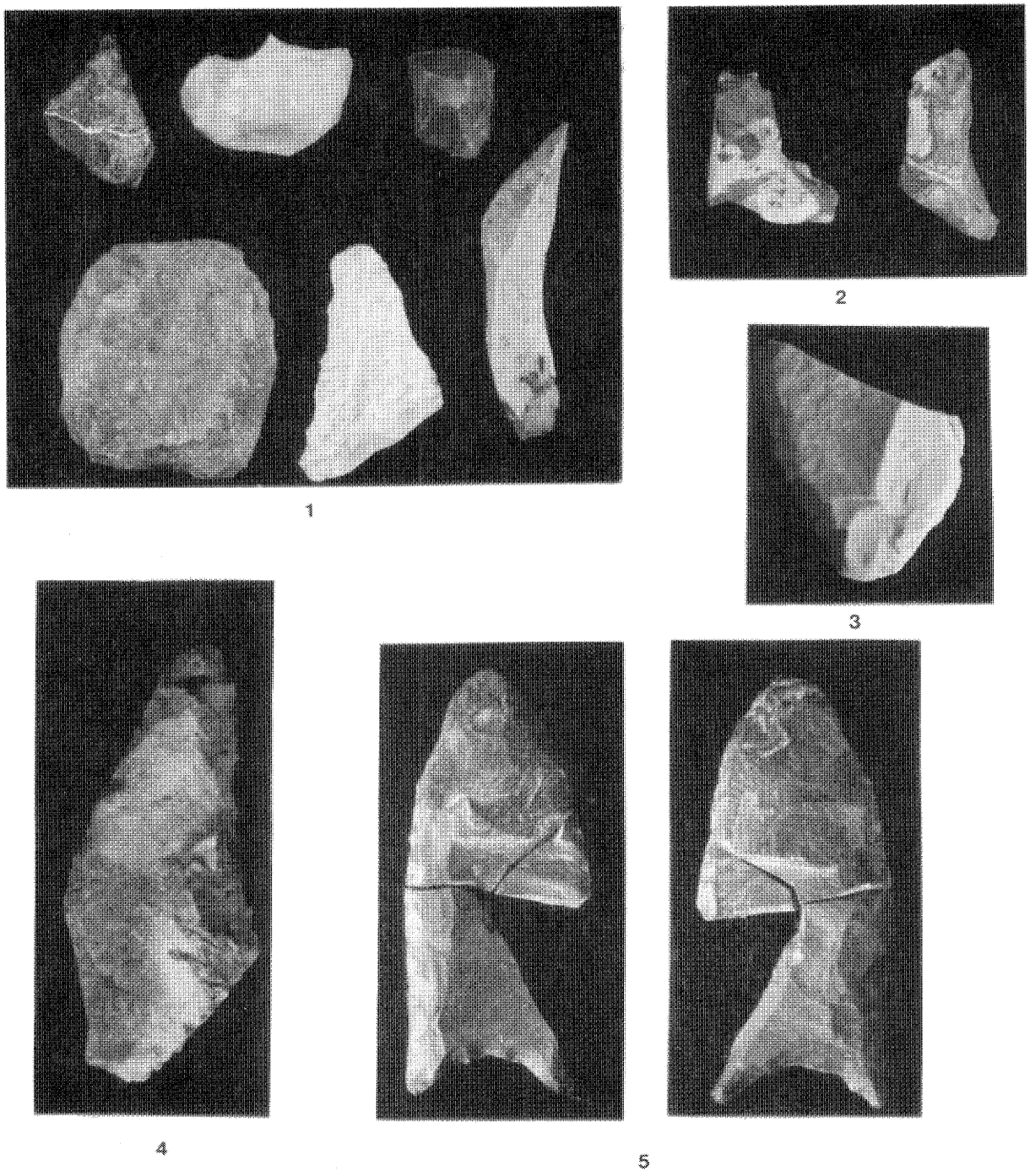


Figure 5.39. Artifacts from the fluted point working surfaces in area B, units 1/9, 2/9, 0/9, -1/9, and 2/11. 1, (top row from left) awl, graver, end scraper, (bottom row) wedge, side scraper, awl; 2, graver, edge worked flake; 3, side scraper on core blade; 4, unifacial knife; 5, fragmentary fluted point (enlarged). (3 and 4 from Clovis hearth, square 0/9 plus-1/9).

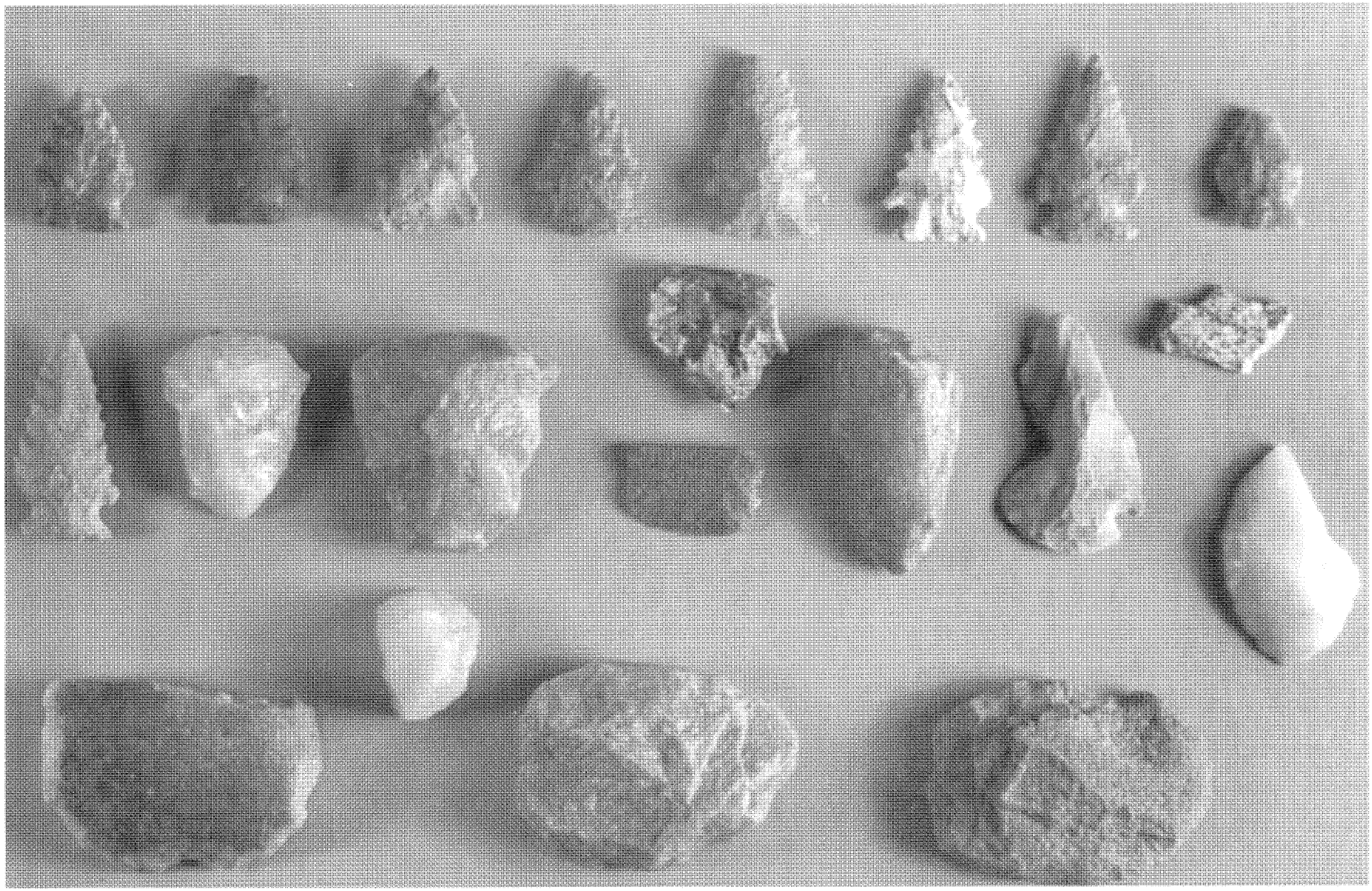


Figure 5.40. Palmer tradition artifacts from Cactus Hill area B, units 1/9, 2/9, and 2/3. Artifacts include Palmer points, end scrapers, edged flakes, bifaces, side scrapers, and a snapped flake graver.

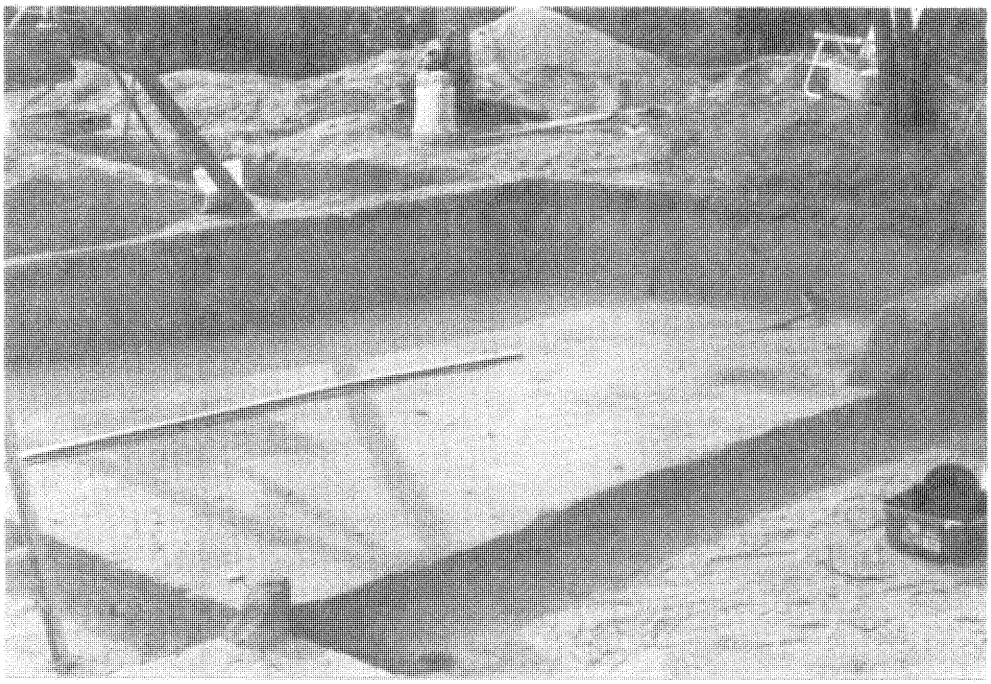


Figure 5.41a. Cactus Hill, excavation area B, squares 1/9 and 2/9, top of level 6. Foreground is completed square 2/11 and background, to southeast, is square 1/7. October 1993 excavation.

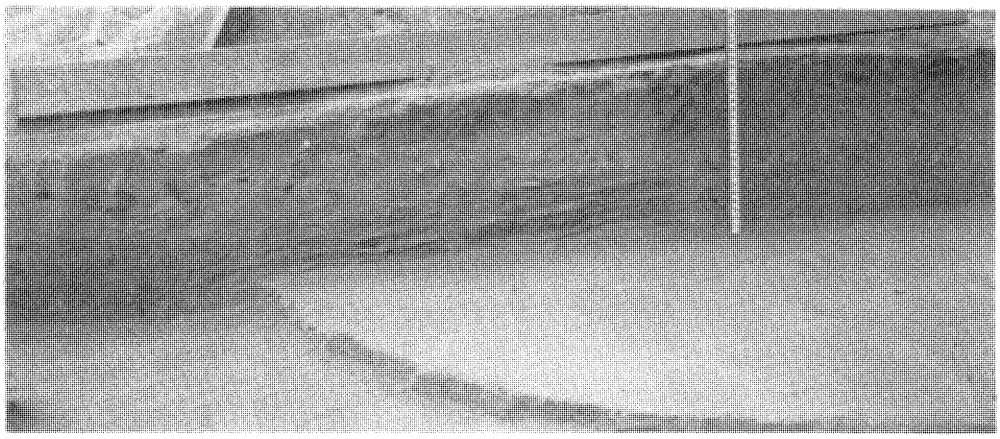


Figure 5.41b. Cactus Hill, excavation area B, square 2/9 southeast wall at bottom of level 6. Top eight inches of soil in plowzone mechanically removed prior to excavation. Clovis artifacts were encountered "in situ" in a band (stratum) from location 3" to location 6" shown on the scale. Undisturbed silt bands have been highlighted in the wall by brushing.

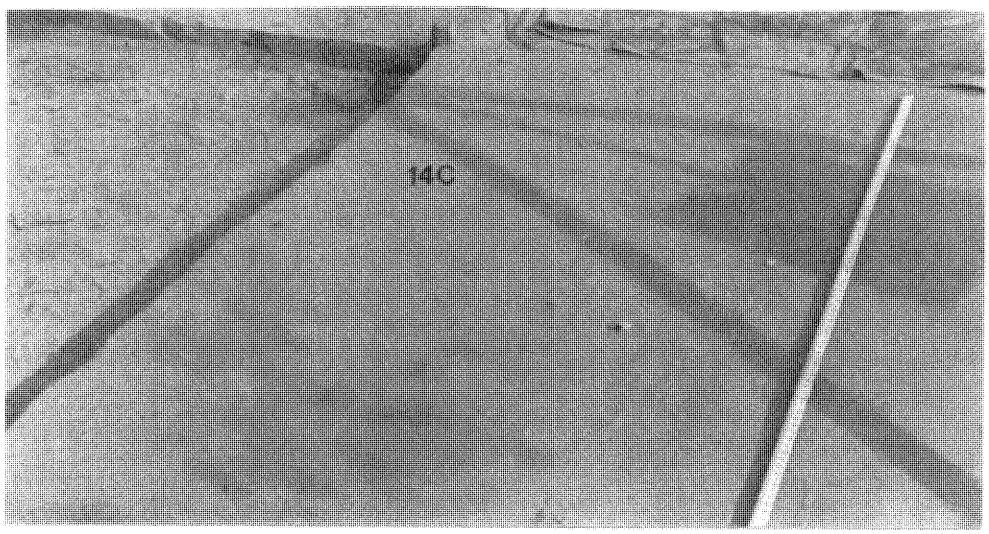


Figure 5.41c. Cactus Hill, excavation area B, square 2/9 (right) and square 2/11 (left), looking north. Carbon sample (white pine) collected in area marked "14C", 1/2" below surface near interface of level 6 and level 7.

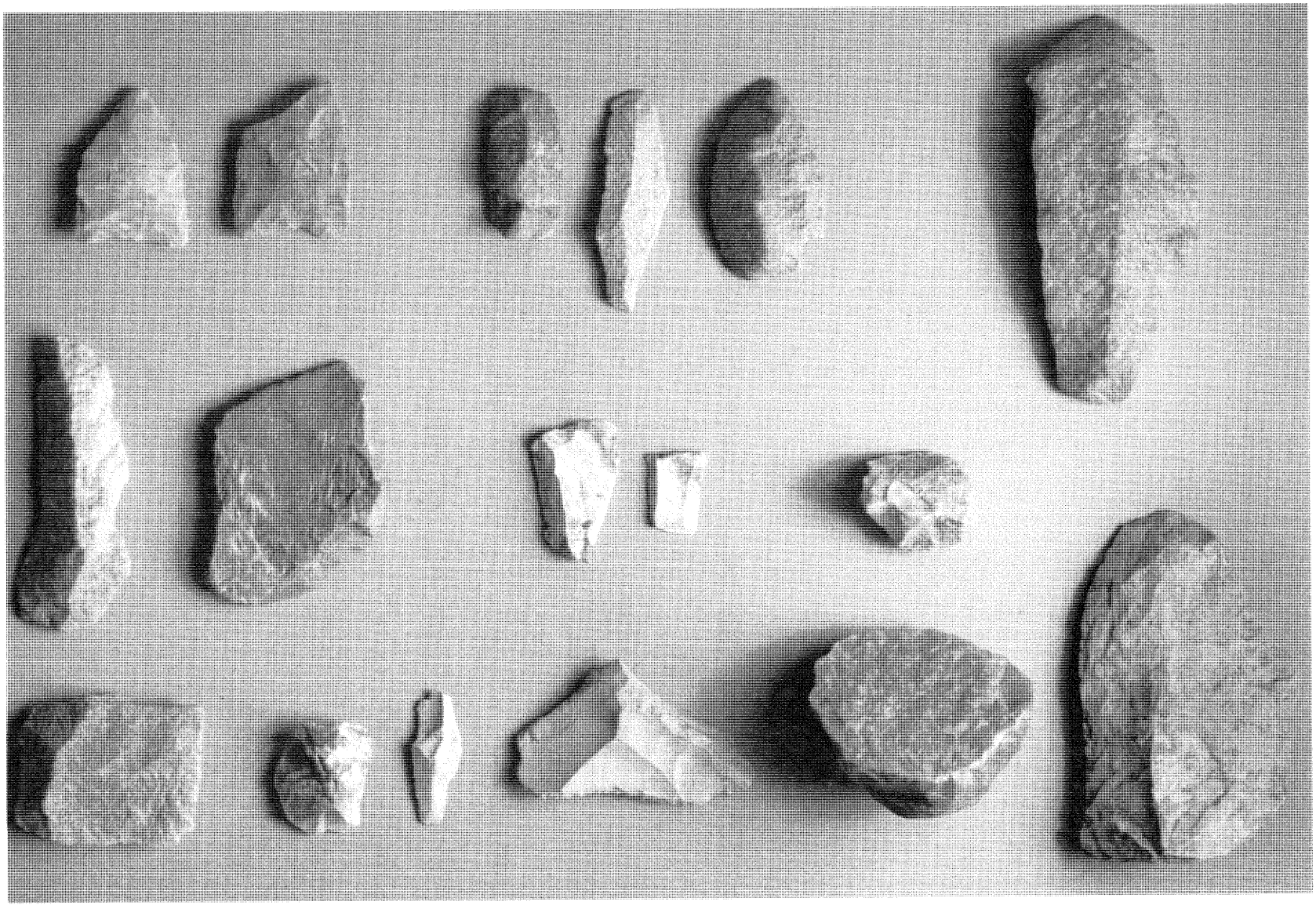


Figure 5.42. Artifacts recovered below Clovis from Cactus Hill area B, units 2/9, 0/5, 2/7, and salvage excavation B. Artifacts include early triangular points, core blades, blade cores, and edged flakes. Three blades (top row center) were recovered with carbon scatter in unit 2/9, level 6 which dated 15,070 +/-70 B. P.

Table 5.36. 44SX202, CACTUS HILL, AREA B, ANALYSIS OF SQUARES 1/9 PLUS 2/9

Level	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.).	Comments
1	150.1	89.0	14,945 54.25	1,521 4.75	1.4	0.4	1.5	Late Archaic, plus transitional Late Archaic, plus Middle Woodland, plus historic (ca 1740) - general till
2	141.3	75.0	15,723 55.0	2,111 6.5	5.08	1.0	3.0	Early Archaic, plus Middle Archaic, plus Late Archaic - general till
3	75.7	16.0	13,158 44.0	2,224 7.0	5.07	3.0	4.0	Early Archaic, plus Middle Archaic, plus feature bottoms from Late Archaic - general till
4	34.9	2.5	7,487 25.2	821 2.8	1.85	2.0	2.0	Paleoindian, plus Early Archaic, plus Middle Archaic, plus Late Archaic feature bottoms - general till
5	15.6	0.12	3,225 10.5	458 1.5	1.56	1.0	2.0	Paleoindian, plus Early Archaic, plus pit bottoms from Middle Archaic features, and general downdrift
6	2.7	0.12	308 0.8	29 0.07	0.2	1.0	0.5	Early Paleoindian, plus downdrift from upper levels
7	1.84	0.05	132 0.35	16 0.04	0.2	1.0	0.2	All downdrift from upper levels
Totals	433.46 (197.0 kg)	182.8 (83.1 kg)	54,978 190.1 (86.4 kg)	7,180 22.7 (10.3 kg)	15.36 (6.98 kg)	9.4 (4.27 kg)	13.2 (6.0 kg)	Total flakes=62,158 Flakes total wt=212.8 lbs. (96.7 kg) Qte=88.45%

Notes: Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms

Table 5.37. 44SX202, CACTUS HILL, AREA B, SQUARES 1/9 + 2/9, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
1	Projectile point (1): Savannah River wide blade/1/qte; Steatite bowl fragment/1/; Rubbed stone/2/1 fragment dibase, 1 fragment slate; Mussel shell/1/; Bifaces/14/qte - thick early stage; Flakes*: 7/jasper - heated, 2/chert - heated, 5/weathered rhy.
2	Projectile points (25): Savannah River narrow blade/2/qte, Bare Island/3/qte, Slade/1/qte, Halifax/1/qte, Halifax/1/qu, Guilford/2/qte, Guilford/3/qu, Morrow Mt. II/6/qte, Morrow Mt. II/1/qu, Morrow Mt. I/1/qu, Stanly/1/qte, LeCroy/1/qu, St. Albans/1/rhy, Kirk Stemmed/1/qu; Biface fragments/28/qte - 2/thin Savannah River-like, Biface fragments/3/qu - most all biface fragments were thick and narrow, and much like those identified with the Middle Archaic; Hammerstones/1/non-local dibase-like; Edge used flakes/6/qte; Unifacial worked cobble fragments used as tools/4/qu; Side scraper/1/qte - roughly edged; Bifacial tool/1/qu; Bipolarized cobble core/1/qu; Tabular scraper fragments/2/layered schist; Flakes*: 4/striped gray and black ss, 3/green ss, 12/fine texture gray rhy, 4/black translucent rhy with specks, 7/blue and white rhy - weathered, 3/yellow weathered rhy, 1/unknown green rhy, 2/blue, gray and white coarse rhy, 2/weathered greenstone, 10/jasper-heated, 10/chert - heated, 1/chert - weathered Williamson, 1/chalcedony, 1/crystal quartz, 1/river cobble chert, 10/Bolster/s Store blue chert, 1/dark black schist-like.

Table 5.37. 44SX202, CACTUS HILL, AREA B, SQUARES 1/9 + 2/9, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
3	Projectile points (11): Halifax/2/qte, Guilford/1/qu, Morrow Mt. II/1/qte, Kirk Serrated/1/qte, St. Albans/1/green ss, St. Albans/1/rhy, Kirk Stemmed/1/qu, Fort Nottoway/1/qte, Decatur/1/qte, Palmer/1/qte, Tip/1/qte - thin and wide.; Biface fragments/10/qte - 2 thin and 8 thick, Biface/1/Bolster's Store blue chert; Ax/1/flaked - weathered metavolcanic; Oblong hammerstone/1/qte; Graver/1/chert - weathering amber chalcedony (Clovis, sq. 1/9); End scraper/1/qu - Palmer-like, End scraper/1/qte - Palmer-like; End scraper/1/qte - roughly edged; Flake knives/4/Mitchell chert or chalcedony, Flake knives/5/qte; Edged thick tools/6/qte, Edged thick tool/1/qu; Smoothing stone/1/qu; Beak-graver/1/qu - heavy, Manuports/10/qte; Circular edged scrapers (Turtle backs)/2/qte, 2/qu; Flakes*: 1/striped gray and black ss, 12/fine texture gray weathered rhy, 13/black translucent rhy, 4/rhy - weathered yellow with oxide spots, 1/rhy or chert-like - unknown type, 1/blue, gray and white coarse rhy, 4/soft weathered greenstone, 1/coarse green volcanic material, 16/jasper - red and brown heated, 4/ heated chert, 2/Williamson chert - weathered, 1/Bolster's Store chert - weathered, 15/blue and brown Bolster's Store chert with pyrite, 1/Mitchell chert - weathered, 3/crystal qu.
4	Projectile points (7): Savannah River wide blade/1/qte, Bare Island/1/qu, Morrow Mt. II/1/qte, Morrow Mt. I/1/chert, Palmer/2/qte, Palmer/1/chert; Bifaces/3/qte - thin with flat bases - broken; Side scrapers/3/qte, Wedges/2/qu; Edge worked flake knives/5/qte, 2/qu, 1/ss; Snapped gravers/2/chert, 1/Bolster's Store, 1/Mitchell chert; End scraper/1/Mitchell chert, 1/qu, 1/qte; Chopper-scraper/1/qte; Tabular scraper/1/schist; Red paint stone fragment/1/iron oxide (ore) - burned; Flakes*: 10/fine texture weathered gray rhy, 11/black translucent rhy, 3/green ss, 1/rhy - weathered yellow with oxide spots, 2/soft weathered greenstone' 14/jasper red-brown heated, 2/burned chert, 1/Williamson chert - weathered, 1/Bolster's Store green chert, 12/Bolster's Store blue and brown with pyrite, 3/river cobble chert, 3/crystal qu - very clear.
5	Projectile points (6): Halifax/1/qte, Morrow Mt. I/1/qte, Palmer/1/qte, Palmer-like/1/rhy, Fluted point/1/chert-like dark rhy, Fluted point/1/clear qu; Bifaces/3/qte - thin, 1/qu; End scraper/1/fossiliferous gray chert - Clovis, Side scraper/6/qte, 1/qu; Spokeshave/1/Mitchell chert - burned, 1/chert; Wedge/1/qte, 1/qu; Awls/2/chert; Edge used flakes/3/qte; Flakes*: 14/fine textured gray rhy, 33/rhy - dark black with white weathered areas, 4/rhy - weathered yellow with oxide spots, 9/green ss, 1/speckled rhy, 1/rhy - dark fine grained striped, 5/rhy - dark green translucent with fine grain, 22/jasper - red and brown heated, 5/chert - burned, 5/unknown chert, 5/fibrous Mitchell (?) chert, 1/oolitic qte, 3/flint-like, 6/crystal qu - clear, 4/cobble chert, 28/Bolster's Store blue and brown with pyrite.
6	Projectile point (1): Palmer/1/qte - disturbed downward from level 4 or 5 (?); Wedge/1/qte; Side scraper/1/qte; Edge worked flake/1/rhy; Core blades/3/qte - all in undisturbed zone associated with a hearth-like scatter of carbonized wood and under a fluted point working surface; Flakes*: 3/rhy - translucent black, 1/rhy - weathered yellow, 3/jasper - burned, 1/chert - burned - possibly WAC, 1/Bolster's Store chert. Note: All flakes were very small.
7	Projectile points (3): Morrow Mt. I/1/qte, St. Albans/1/green ss, Kirk Corner Notched/1/river cobble chert (Note: All are from a possible disturbed area near southeast wall in square 1/9.); Side scraper/1/cobble rhy; Graver/1/Mitchell chalcedony - Clovis; Red paint stone/1/iron oxide (ore) - burned and heavily rubbed; Flakes*: 4/rhy - translucent black, 3/green ss, 1/chalcedony - WAC, 1/Bolster's Store chert, 1/chert - unknown - partly worked. Note: Most of these flakes were very small.

Notes: *Flakes other than quartz and quartzite.
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate; WAC=weathering amber chalcedony

Excavation Units 1/11 Plus 2/11

These adjacent units were excavated in the same time period, but they were not excavated as a single unit. They will be analyzed as a single unit because the 10 levels in each excavation were of nearly equal thickness and because these two areas were adjacent to units 1/9 plus 2/9. Units 1/9 plus 2/9 were analyzed as a single excavation unit and were just to the east of 1/11 plus 2/11. Units 1/11 plus 2/11 together measured 10 feet by 15 feet. The 8 inch plow zone (soil zone 1) was removed mechanically, and the units were excavated in 10 levels of approximately 2 inch thickness. Diagnostic artifacts were encountered in levels 1 through 6 for unit 1/11 and levels 1 through 8 for unit 2/11. This is indicated for the individual units in Appendix A. The excavation units combined produced a total of 43 diagnostic projectile points and a total weight of lithic cultural materials of 320 lbs. (145.4 kg). The quartzite and quartz debitage (flakes plus shatter) total for the units was 58,154, of which 86.85% was quartzite. The degree of mixing or till in these units was quite large. Level 1 produced material ranging in age from Early Archaic through Late Archaic; level 2, Middle Archaic and Late Archaic; level 3, Early Archaic through Late Archaic; level 4, Middle Archaic and Late Archaic; level 5, early in the

Middle Archaic; level 6, Paleoindian through Late Archaic; level 7, Middle Archaic; and Level 8, Early Archaic and Middle Archaic. The numbers of projectile points from levels 1 through 8, by level, of the combined units is irregular, and was 9, 8, 9, 5, 1, 7, 1, and 3. Even so, at level 6 and level 7 of unit 2/11, the Paleoindian fluted point working surface seemed to occur over a small area at the same deposit depth as in adjacent square 2/9.

Identifiable features were minimal in unit 1/11, but several well defined hearth features were recorded in unit 2/11. The features are identified in Table 5.38.

Table 5.38. FEATURES, UNIT 1/11+2/11

Unit	Level	Feature #	Feature Description/location	Feature Size/orientation	Components and Associations
1/11	1	1/11-1-f1	surface hearth northeast	38" x 22" x 3" E-W	53 FCR, 1" to 4" size; two broken qte bifaces
2/11	1	2/11-1-f1	surface hearth southeast	20" x 13" x 2" E-W	26 FCR, 1.5" to 2.5" size, adj. to Morrow Mt. II point
2/11	1	2/11-1-f2	surface hearth northwest	circular 12" x 10" x 2"	21 FCR, 1" to 2" size, qte biface
2/11	3	2/11-3-f1	pit hearth southeast	circular 11" x 13" x 3"	11 FCR, 1" to 2" size, Morrow Mt. II point
2/11	3	2/11-3-f2	pit hearth southwest	circular 13" x 13" x 4"	13 FCR, 1"-2" size, no association
2/11	3	2/11-3-f3	pit hearth northwest	16" x 12" x 4" E-W	14 FCR, 1"-3" size, Morrow Mt. II point
2/11	3	2/11-3-f4	surface hearth northeast	24" x 12" x 2" E-W	21 FCR, 1.5"-3" size, no association
2/11	3	2/11-3-f5	surface hearth northwest	20" x 18" x 2.5" NW-SE	16 FCR 2"-3" size, Bare Island-like point
2/11	4	2/11-4-f1	pit hearth southwest	circular 11" x 11" x 3"	8 FCR, 1"-1.5" size, no association
2/11	5	2/11-5-f1	surface hearth ?, and working surface southeast	24" x 14" x 3" N-S	7 cobbles (heated) 2"-4" dia., large tabular schist scraper, St. Albans point (adjacent in unit 1/11), worked quartzite flakes

Most of the features were associated with the Middle Archaic Morrow Mountain II tradition, but at least one feature in level 5 appeared to be of Early Archaic age, tentatively St. Albans. This is based upon identification of the large tabular schist scraper and St. Albans point (square 1/11) found near the feature. Similar scrapers were identified by NRS in 1991 with St. Albans points upon the Stith Site about 10 miles upriver in Sussex County and in area D at Cactus Hill. The distribution of tools of similar form and distribution of similar foreign materials (flakes) throughout the deposit depth support the conclusion that there was quite a bit of disturbance. The disturbances, however, were localized, and some general areas within the combined excavation seemed to retain the proper chronological sequence of diagnostic artifacts. The small fragment of the black (chert-like) rhyolite fluted point found in the northwest corner of level 6 fit with the two fragments of the same artifact found in level 5 (similar depth in deposit) of square 2/9. And, the graver and edge used flake found in unit 2/11, with the fluted point fragment, are assumed to be part of the Paleoindian working surface extending from unit 2/9 into unit 2/11. This is shown in Figure 5.38.

Based upon the depth of the artifacts found in unit 2/9, it is unlikely that any remnants of working surfaces extended below levels 7 or 8 of unit 2/11. Also, most artifacts below level 6 in the combined unit 1/11 plus 2/11 excavation probably represent downdrift from disturbances. There are 42.5 lbs. (19.3 kg) of lithic cultural materials, or about 13.3% of the total unit weight, below level 6. While relatively undisturbed remnants of working surfaces, and some undisturbed features, were encountered throughout the excavation unit, no individual working surface of the Archaic period could be identified with enough certainty to a particular

temporal marker to suggest that detailed debitage analyses would be meaningful. A few general observations may be made form the quantity of debitage and FCR in the individual (arbitrary) levels. There are significant increases in quantity of debitage around level 2 and level 5, but the relative age of these concentrations is unknown. Quartz seems to increase slightly in popularity in the deeper levels, probably representing an increase in popularity of this material by one or more traditions of the Early Archaic period. Fire cracked hearth rock decreases significantly in level 5, and almost disappears below level 5. The number of flakes of materials other than quartzite or quartz (non-local ?) in the levels from 1 through 8 are noted as: 8, 12, 27, 30, 40, 49, 14, and 20 respectively. There seem to be plateaus in use at levels 1 plus 2, levels 3 plus 4, and possibly levels 5 plus 6. These data suggest there is a general decrease in the occurrence of non-local materials, from earlier to later times; however, several of the unique materials are recognizable across more than two levels of the excavation. The general tabulation of artifacts by level for units 1/11+2/11 is presented as Tables 5.39 and 5.40.

Table 5.39. 44SX202, CACTUS HILL, AREA B, ANALYSIS OF SQUARES 1/11 PLUS 2/11

Level	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifact (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comments
1	37.5	22.6	3,684 12.2	648 1.82	0.6	0.3	--	Early, Middle and Late Archaic
2	79.0	44.0	8,843 29.4	1,259 3.6	1.4	0.5	--	Middle and Late Archaic
3	56.0	25.9	6,931 21.5	1,136 3.5	3.2	0.7	1.2	Early, Middle and Late Archaic
4	49.5	16.1	7,895 26.4	1,172 3.6	2.4	1.0	--	Middle and Late Archaic
5	43.0	6.45	9,886 26.1	1,441 3.9	4.8	1.5	0.25	Early in the Middle Archaic
6	26.5	1.5	6,461 17.2	629 1.8	4.7	1.0	0.3	Paleoindian, Early, Middle and Late Archaic
7	14.0	1.7	3,263 8.4	507 1.6	1.8	0.5	--	Middle Archaic
8	8.5	0.7	2,177 5.7	480 1.3	0.6	0.2	--	Early and Middle Archaic
9	5.0	0.7	1,269 3.3	287 0.7	--	0.1	--	No diagnostic artifacts
10	1.0	0.65	99 0.22	15 0.03	--	0.1	--	No diagnostic artifacts
Totals	320.0 (145.4 kg)	120.3 (54.7 kg)	50,508 150.4 (68.4 kg)	7,574 21.85 (12.7 kg)	19.5 (8.9 kg)	5.9 (2.7 kg)	1.75 (0.8 kg)	58,154 flakes wt=172.25 lb. (78.3 kg)

Notes: Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms

Table 5.40. 44SX202, CACTUS HILL, AREA B, SQUARES 1/11 + 2/11, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material, Description
1	Projectile points (9): Savannah River - wide/1/qte, Savannah River - narrow/1/qte, Bare Island/1/qte, Slade/1/qte, Morrow Mt. II/2/qte, 1/qu, Morrow Mt. I/1/arg, Palmer/1/qte; Bifaces/6/qte; Utilized core fragment/1/qu; Flakes*: 1/chert, 3/burned jasper - red, 2/argillite, 1/translucent green rhy, 1/weathered black and white rhy.
2	Projectile points (8): Untyped stemmed/1/qu, Bare Island/1/qte, Slade/2/qte, Guilford/2/qte, Morrow Mt. II/2/qte; Bifaces/13/qte, 1/qu - all narrow and thick - Middle Archaic; Spokeshave/1/chert; Edged thick flakes/2/qte; Pendant fragment/1/schist; Wedge/1/qu; Edge used flake/1/chert; Flakes*: 3/burned chert, 2/gray translucent rhy, 4/green ss, 3/translucent green rhy.
3	Projectile points (9): Bare Island/1/qte, Halifax/2/qte, Morrow Mt. II/4/qte, Kirk Serrated/1/rhy, Palmer/1/qte, Tip/1/qte - serrated; Bifaces/6/qte; Chipped adz blade/1/qte; Edged flake/1/qte, Flake knife fragment/1/red chert - burned; Thick edged flakes or core fragments/3/qte, 1/qu, Thick bifacial tool/1/qu; Cores/3/qte - cobbles, cores/2/qu - bipolar; Wedge/1/qu; Red paint stone/1/iron oxide (ore) burned; Flakes*: 3/weathered translucent gray rhy, 5/green ss, 5/weathered arg, 1/green chert, 1/light green rhy, 4/burned chert, 3/yellow weathered rhy, 2/blue chert, Fire fractured chert cobble/1/red, 2/gray slate fragments.
4	Projectile points (5): Small stemmed/1/qte, Halifax/1/qte, Guilford/1/qte; Morrow Mt. II/1/qte, Morrow Mt. I/1/arg; Bifaces/12/qte - thick elongated Middle Archaic, Biface/1/qu - long narrow; Thick edged flake or core tools/2/qte, 2/qu (one qte tool also used as a smoothing stone); Edged tabular scrapers/3/qte; Edge worn flakes/2/qte; Core blades/2/green ss, core blade/1/qte; Flakes*: 1/coarse gray rhy, 3/weathered gray fine texture rhy, 3/yellow rhy with oxide spots, 3/soft arg - weathered, 4/yellow jasper, 4/burned chert - red (shatter), 3/heated jasper - red, 2/green chert, 1/green ss, 2/metavolcanic - coarse green, 3/schist fragments, 1/crystal qu.
5	Projectile points (1): Kirk Serrated/1/qte; Bifaces/9/qte, 2/qu, 1/qu - circular and thin; Large unifacial end scraper/1/qu; Heavy bifacial tools/2/qte; Heavy unifacial tools/4/qte; Snapped flake graver/1/translucent gray rhy; Smoothing stones/2/qte; Cores/1/qte; Edged flake/1/rhy; Edged flakes/3/qte; Edge used flakes/2/qte; Bipolar cores/2/qu; bipolar core flakes/5/qu; Edge used bipolar core flakes/2/qu; Flakes*: 10/fine texture weathered gray rhy, 3/yellow rhy with oxide spots, 10/heavily weathered arg or rhy, 6/red chert - burned, 5/red jasper - burned, 3/chert, 2/crystal qu, 1/black schist - fragment.
6	Projectile points (7): Small Stemmed/1/qu, Morrow Mt. I/1/qu, Morrow Mt. I/1/chert, St. Albans/1/qte, Fort Nottoway/1/qte, Kirk C-N/1/qte, Palmer/1/qte, Clovis/1/rhy - fragment - matched fragments from sq. 2/9; Bifaces/6/qte - thinner than level 5 bifaces, 1/qte - triangular and thin; Large tabular scraper/1/schist, Large end scraper/1/qte; Wedge/1/jasper, 1/qu, Unifacial tool/1/qte - triangular scraper; Used flakes/1/qte, 2/qu; Red paint stone/2/iron oxide (ore) - burned; Pendant fragment/1/gray schist; Anvil or mortar stone/1/qte; Cobble core/1/qte - struck blades; Notched cobble net sinker/1/qte; Flakes*: 10/fine textured gray weathered rhy, 5/weathered arg, 2/yellow rhy with oxide spots, 3/green ss, 4/burned chert, 14/red jasper - heated, 3/chert, 1/fibrous chert, 2/green chert, 2/crystal qu, 3/schist.
7	Projectile point (1): Morrow Mt. /1/qte; Bifaces/3/qte, 1/qu - thick, 1/rhy - fragment; End scraper/1/qu - Palmer-like; Wedge/1/jasper - fragment; Graver/1/jasper; Edge used flake/1/jasper; Thick unifacial edged tools/4/qu; Flake knife/1/green ss; Edged flake/1/chert; Edged used flake/1/qte, large edge used cobble fragment/1/qte; Flakes*: 2/weathered gray rhy, 2/fine grained light gray rhy, 1/green ss, 3/burned chert, 1/jasper, 4/yellow chert, 1/crystal qu.
8	Projectile points (3): Morrow Mt. I/1/chert - burned fragment, Kirk Serrated/1/qte, Decatur/1/qte, Tip/1/jasper; Biface/1/qte; Drill tip/1/qu; Wedge/1/qu; Notched pendant/1/gray schist, Pendant/1/gray schist; Edge used flakes/2/qte; Edged thick core tool/1/qu; Flakes*: 3/fine grain weathered gray rhy, 8/fine grain yellow-green weathered rhy, 1/soft arg, 1/speckled rhy, 2/burned jasper, 3/burned chert, 1/crystal qu, 1/schist fragment.
9	No formal artifacts recovered
10	No formal artifacts recovered

Notes: *Flakes other than quartz and quartzite.
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Excavation Unit 4/9

This 10 foot by 10 foot square just north of unit 2/9 was excavated in October 1993. Unit 4/9 was excavated during the period units 1/9 and 2/9 were excavated, but 4/9 was worked by a different crew. This unit was undisturbed by artifact collectors, and there were no modern disturbances indicated in the field notes. The 8 inch thick plow zone was removed mechanically, and the remaining deposit was excavated in 10 levels. Levels 1 through 9 were excavated in thicknesses of 1.5 to 2 inches and the final level 10 was later excavated to a depth of 3 inches. The entire excavation block was therefore 10 feet by 10 feet by 18 inches deep. The total thickness of cultural materials in this unit was 26 inches.

Diagnostic artifacts were encountered only in levels 1, 4, 5, and 7 and the total number of diagnostic artifacts was fairly low at 9. Level 1 and level 4 produced Middle Archaic material in the south end (upslope) of the square, while levels 5, 6, and 7 produced Middle Archaic material in the north end (downslope) of the square. This was the first square excavated which clearly showed the effects of slope across the square. No hearth features were recorded for square 4/9, although there were 63.35 lbs. (28.8 kg) of fire cracked rock distributed across levels 1 through 5. Level 8 at the southeast end (upslope) produced a large working surface with hammerstones, abrading stones, edged flakes, scrapers, broken bifaces, a concave base hafted bifacial knife, and numerous large biface reduction flakes. Although no diagnostic artifacts were recovered, the hafted concave base knife and the tools appeared similar to those of Decatur, Fort Nottoway, or Kirk design.

The extreme southwest edge of this square was considered to be part of the Paleoindian fluted point working surface which was located primarily in excavation unit 2/9. In unit 4/9 no Paleoindian projectile points or tools were found, but this area did produce large biface reduction flakes of oolitic quartzite and weathering amber chalcedony which are lithic types associated with the fluted point tradition use of the site. One gray-white oolitic quartzite biface was reduced in this square producing 18 discarded biface reduction flakes. These flakes with unusual fossilized shell inclusions were unique in the lithic assemblage at Cactus Hill and allowed an analysis of the degree of disturbance of the deposit. The flakes by level were recorded as follows: level 5, 1 flake; level 7, 11 flakes; level 8, 1 flake; level 9, 5 flakes. This clearly indicates that the flakes were distributed throughout at least 3 or 4 inches of deposit depth (level 7 to level 9), but movement into higher levels was minimal.

Adjacent upslope excavation units 1/9 + 2/9 totaled 150 square feet and produced 51 diagnostic projectile points, while the 100 square feet of unit 4/9 produced only 9. This was clearly a result of the lower desirability of the sloped ground in the area of unit 4/9, and this added credibility to the argument for the terrace-edge nature of adjacent unit 2/9. The sudden drop in elevation into unit 4/9 was indicated by the slope of the lamellar silt banding shown in Figure 5.41b. The oldest diagnostic projectile points recovered in this unit were two St. Albans points (one was badly broken with only a tentative identification). The unit produced a total of 198.5 lbs. (90.29 kg) of culturally related lithics of which 117.4 lbs. (53.4 kg) were quartzite and quartz flakes. Quartzite was 88.8% by weight. The total number of such flakes was 32,805. There was a general increase in quartz in the lower levels. Tables 5.41 and 5.42 present the artifacts recovered from unit 4/9 by level.

Table 5.41. 44SX202, CACTUS HILL, AREA B, ANALYSIS OF SQUARE 4/9

Level	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comments
1	11.1	7	1,126 3.8	53 0.2	0.10	--	--	Late Archaic
2	6.65	4.2	507 1.9	26 0.1	0.25	0.2	--	No diagnostic artifacts
3	35.9	17	4,701 15.3	497 1.7	1.9	--	--	No diagnostic artifacts

Table 5.41. 44SX202, CACTUS HILL, AREA B, ANALYSIS OF SQUARE 4/9

Level	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comments
4	26.8	10.8	4,192 13.4	467 1.6	1.0	--	--	Middle Archaic
5	41.25	19.85	4,823 17.3	403 1.7	1.6	--	0.8	Early Archaic plus Middle Archaic
6	21.5	3.2	5,074 15.8	378 1.2	1.3	--	--	No diagnostic artifacts
7	20.9	1	3,724 14.75	639 2.25	0.9	2.0	--	Middle Archaic
8	24.6	0.2	3,590 15.8	697 3.2	4.4	--	1.0	Early Archaic
9	9.1	0.1	1,481 5.8	321 1.2	2.0	--	--	Early Archaic
10	0.7	none	91 0.32	22 0.08	--	0.3	--	No diagnostic artifacts
Totals	198.5 (90.29 kg)	63.35 (28.3 kg)	29,309 104.2 (47.4 kg)	3,503 13.23 (6.0 kg)	13.45 (6.1 kg)	2.5 (1.1 kg)	1.8 (0.82 kg)	Total flakes=32,805 Total flake wt=117.4 lbs. (53.4 kg) (88.8% are qte)

Notes: Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms

Table 5.42. 44SX202, CACTUS HILL, AREA B, SQUARE 4/9, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material
1	Projectile point (1): Slade/1/qte; Biface/3/qte-tips; Edged flake/1/qte; Flake*: 1/crystal quartz.
2	No projectile points; Bifaces/2/qte-oval, one thin; Edged flake/1/qte-roughly edged.
3	No projectile points; Bifaces/13/qte; Biface/1/qu (most bifaces thick elongated ovals, 2 wide thin); Edged flakes/3/qte - roughly edged; Red paint stone/1/iron oxide (ore) - burned; Smoothing stone/1/qte; Flakes*: 1 chert (Bolster's Store green), 1/chert (Bolster's Store), 1/greenstone.
4	Projectile point (1): Morrow Mt. II/1/qte; Bifaces/11/qte; Quartz core/1/cobble; Edge worked flake/1/Mitchell chert; Red paint stone/1/iron oxide (ore) - burned; Flakes*: 1/red jasper - heated, 2/Bolster's Store chert, 1/yellow weathered rhyolite with oxide spots, 4/blue layered chert, 1/green argillite, 1/blue oolitic qte, 1/green schist fragment.
5	Projectile points (5): Halifax/1/qu, Morrow Mt. II/2/qte, St. Albans/1/rhy., Kirk C-N/1/qte, tip/1/qte; Bifaces/9/qte, /1/green ss, (most bifaces are narrow and thick); Edged flakes/3/qte; Edge used flake/1/qte; End scraper/1/qu - thick core fragment; Wedge/1/qu; Core/1/qte - used as chopper; Flakes*: 1/argillite, 1/green translucent rhy, 1/gray coarse rhy, 1/green ss, 5/Bolster's Store chert - blue and red, 2/cobble chert, 1/gray-white oolitic quartzite, 2/weathering amber chalcedony.
6	No identifiable projectile points; Tip/1/qte; Bifaces/8/qte - 4 thin triangular and 4 thick elongated ovals; Side scraper/1/qte - unifacial; Side scraper/1/qte - bifacial; Edged flake/1/qte; Edged flake/1/qu; Core/1/qu - crystal, Red paint stone/3/burned iron oxide (ore); Flakes*: 1/yellow rhyolite - weathered with oxide spots, 1/blue rhyolite, 1/crystal quartz.
7	Projectile points (2): Guilford/1/qte; Kirk Serrated/1/qte; Bifaces/2/qte - one thin and one thick elongated oval; Edged flakes/5/qte - roughly edged; Edged flake/1/qu; Edge damaged or used flakes/4/qu; Tabular stone fragment/1/schist; Flakes*: 11/gray-white oolitic quartzite, 7/Bolster's Store chert, 1/Mitchell chert, 3/red jasper - heated, 4/gray weathered translucent rhy, 1/weathered argillite, 1/green ss, 2/green translucent rhy., 2/layered cobble chert.
8	No identifiable projectile points; Tip/1/qte - wide and thin - serrated; Bifaces/5/qte - thick early stage; Biface/1/qte - circular - thin; Biface/1/qu - thick elongated oval; Bifacial knife/1/qte; Edged flake or core fragments/4/qte - thick; Edged flakes/7/qte; Edged flake knife/1/qte - thin delicately worked; Edged flake/1/qu; Bipolar core

	fragments/2/qu; Cobble core/1/qte; Hammerstones/3/soft sandstone; Mano/1/qte - also used as a hammer; Tabular slabs used as smoothing stones/2/sandstone and greenstone; Pitted stone/1/sandstone - fragment; Flakes*: 1/very clear crystal quartz, 3/crystal quartz, 3/waxy yellow chalcedony, 2/jasper, 1/green translucent rhy, 3/green ss, 1/gray weathered fine grain rhy, 1/layered cobble chert, 1/gray-white oolitic qte, 1/yellow weathered rhy.
9	Projectile point (1): Fragment of a bifurcated base biface/1/rhy; Bifaces/3/qte - wide and thin; Biface/1/qte - thick, early stage; Worked heavy cobble fragments/3/qte; Edged cobble/1/qte; Edge worked flake/2/qte; Edge worked flake/1/qu - burned crystal; Flakes*: 5/gray-white oolitic qte, 1/gray fine grain rhy, 1/white chert, 1/Bolster's Store chert, 1/black flint - mountain type, 1/cobble chert, 1/green argillite, 3/weathered yellow rhy.
10	No projectile points; Flakes: 1/blue rhy - coarse.

Notes: *Flakes other than quartz and quartzite.
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Excavation Unit 4/11

Unit 4/11 was excavated in October 1993. This 10 foot by 10 foot unit was excavated in seven levels below an 8 inch plow zone. The plow zone was stripped mechanically. The upper 5 levels were excavated in thicknesses averaging 2.5 inches, level 6 was 4 inches in thickness, and level 7 was 3 inches thick. The excavated unit was therefore 10 feet by 10 feet by 19.5 inches thick. The total depth of cultural material in this unit was 27.5 inches.

This unit was downslope to the north of the ridge center, and clearly was not as heavily utilized as the higher ground 15 to 20 feet to the south. Excavation 4/11 produced 140.4 lbs. (63.8 kg) of culturally related lithics, and 61.30 lbs. (29.9 kg) of this was fire cracked hearth stone. The 16,234 quartzite plus quartz flakes weighed 64.5 lbs. (29.3 kg) and 85.7% of this was quartzite.

The 14 diagnostic projectile points from the square were 8 Middle Archaic, 2 Early Archaic, and 4 Late Archaic types. No hearth features were recorded and the FCR was primarily a random scatter across levels 1, 2, and 3. The two recorded features were a mortar and associated core/hammer in the southeast corner of levels 5 and 6 (feature 4/11-5/6-F1), and an Early Archaic working surface fairly well preserved in the north end of level 6 (feature 4/11-6-F1). Levels 1 through 5 produced a mixture or till of Middle Archaic and Late Archaic artifacts quite typical of that observed in many of the excavation units in area B of Cactus Hill. Some of level 4 and level 5 was probably a Morrow Mountain I working surface, as a higher percentage of the debitage was bipolar shatter, and a Morrow Mountain I point was found among these flakes.

Deep in level 6 at the north end of the square a working surface was encountered which appeared to be a continuation of the scatter of tools encountered in adjacent square 4/9 at level 8. These two squares were excavated at different times by different crews, and level 6 of 4/11 matched level 8 of 4/9. The total working surface in units 4/9 plus 4/11, which was associated with two Decatur points, measured over 15 feet (4.6 m) east-to-west, and apparently was 4 feet (1.2 m) or more wide north-to-south. It may have extended up to 2 feet further into square 6/11 which is directly north of unit 4/11. The area north of unit 4/9 was not excavated due to previous disturbances.

The unit 4/11 level 6 working surface was littered with broken bifaces, biface reduction flakes, edge used/worn flakes, heavy flake and core tools, hammerstones, smoothing (abrading) stones, and wedges. Except for the two Decatur points and two unifacial flake knives, there were no finely worked tools, end scrapers or other delicate small tools. This feature was interpreted as a heavy work area where biface reduction, coarse work in wood and stone, and possibly butchering were accomplished. The level below this surface (level 7) contained no diagnostic artifacts, and most of the material appeared to be downdrift from the above levels. The artifacts recovered in square 4/11 are presented by level in Tables 5.43 and 5.44.

Table 5.43. 44SX202, CACTUS HILL, AREA B, ANALYSIS OF SQUARE 4/11

Level	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/weight (lb.)	Qu Flakes and Shatter #/weight (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comments
1	21.75	17.5	577 2.5	109 0.44	0.8	0.5	--	Middle Archaic plus Late Archaic
2	33.25	24.0	1,658 602	214 0.8	0.75	1.5	--	Middle Archaic
3	21.40	11.0	1,923 7.7	367 1.3	1.4	--	--	Middle Archaic plus Late Archaic
4	9.60	4.0	1,130 4.35	176 0.65	0.6	--	--	Middle Archaic plus Late Archaic
5	20.20	4.0	2,798 12.8	557 2.2	1.21	--	--	Middle Archaic
6	30.40	0.7	5,103 19.65	890 3.35	3.45	2.0	1.25	Early Archaic
7	3.80	0.1	604 2.1	128 0.4	0.2	1.0	--	Down drift
Totals	140.4 (63.8 kg)	61.30 (29.9 kg)	13,793 55.3 (25.1 kg)	2,441 9.15 (4.1 kg)	8.4 (3.8 kg)	8.4 (3.8 kg)	1.25 (0.57 kg)	Total flakes=16,234 Flake wt=64.5 lbs. (29.3 kg) Qte=85.7%

Notes: Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms

Table 5.44. 44SX202, CACTUS HILL, AREA B, SQUARE 4/11, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material
1	Projectile points (2): Slade/1/qte, Stanly/1/qte, tip/1/qu; Bifaces/7/qte, /1/qu - thick oval; Hafted bifacial drill(?)/1/qte; Edged flake/1/qte; Edge used flakes/4/qte; Wedge/1/qu; Flakes*: 1/coarse blue rhyolite, 2/fine grain translucent gray rhy, 1/green argillite, 1/burned chert - pink, 1/Bolster's Store blue chert, 2/brown jasper, 1/crystal quartz.
2	Projectile points (2): Guilford/1/qte, Morrow Mt. II/1/qte, Broken base/1/qte; Bifaces/3/qte - thin small ovals; Biface/1/qu - thick triangular; Edged flake/1/qte; Edge used flake/1/qte, /1/qu; Bipolar core/3/qu; Bipolar cores/1/qte; Edged flake-awl/1/Bolster's Store green chert; Flakes*: 1/silicified wood, 2/heated jasper - red, 1/layered cobble chert, 2/schist fragments.
3	Projectile points (5): Bare Island/2/qte, Morrow Mt. II/2/qte, Morrow Mt. II base (?)/1/rhy; Edged flakes/5/qte; Edge used flake/1/cobble chert, /1/qu; Large flake chopper/1/qte; Bipolar core/1/crystal quartz - small; Bipolar core/1/qte; Red paint stone/1/burned iron oxide (ore); Flakes*: 2/green ss, 2/fine structure translucent gray rhy, 4/blue and red chalcedony, 1/weathered gray and white rhy, 1/dibase.
4	Projectile points (2): Bare Island/1/qte, Guilford/1/qte; Bifaces/4/qte - thick elongated oval; Edged flake/1/qte; Edge used flakes/2/qte; Bipolar cores/2/qu; Flakes*: 1/fine structure green translucent rhy, 1/white chalcedony.
5	Projectile points (1): Morrow Mt. I/1/qu; Bifaces/4/qte - 3 thin and wide, one thick and wide; Thick edged flake or core fragment tools/2/qte - unifacial; Thin edged tools/4/qte - unifacial and bifacial; Bipolar cores/2/qu; Polyhedral blade core/1/qu; Flakes*: 2/crystal quartz, 1/silicified wood (same as level 2), 1/Bolster's Store chert, 1/red jasper - heated.
6	Projectile points (2): Decatur/1/qte, Decatur/1/green ss with oxide spots; Bifaces/10/qte - wide thick with square base; Edged thick flakes and core fragments/4/qte; Fine edged flake knife/1/rhy; Fine edged flake knife/1/qte; Edge used flakes/8/qte; Wedge/1/qu - small; Smoothing (abrading) stones/4/qte; Cores/2/qte; Large mortar/1/qte - flat slab type - near core; Flakes*: 3/green ss, 1/fine structure weathered gray rhy, 1/red jasper - heated, 2/crystal quartz, 1/silicified wood
7	No projectile points; Edge used flakes/2/qte; Edged flake knife/1/qu; Blade-like flakes/2/qte; Small bipolar core/1/qu; Flakes*: 2 crystal quartz, 1/green ss, 1/blue-white Bolster's Store chalcedony, 1/cobble chert, 1/schist fragment.

Notes: *Flakes other than quartz and quartzite.
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Excavation Unit 6/11

This 10 foot by 5 foot unit was excavated in October 1993 in Area B at Cactus Hill down slope (north) of unit 4/11 and about 25 feet north of the major concentrations in unit 1/11. The 6 inch plow zone was stripped mechanically, and this unit was excavated in 8 levels of 2.5 to 3 inch thickness. The total thickness of strata containing cultural material in this unit was 28 inches. This was one of the first units excavated by volunteers in area B in the October 1993 excavation, and for reasons not explained in the field notes only those flakes, shatter and FCR greater than approximately 15 mm in size were retained. Therefore, the resulting numbers of flakes and weights of flakes in Table 5.45 for unit 6/11 are low. The retained number of flakes is 1,240 which is estimated to be lower than the number recovered by a factor of 4 to 6. The weight of retained flakes is 12.2 lbs. and this is estimated to be low by a factor of 1.5 to 2. Even with these considerations, there is a significant decrease in the amount of culturally related lithic materials in this down-slope area of the site. The number of diagnostic artifacts recovered, however, is 8 which is higher, per square foot excavated, than recovered in either units 4/9 or 4/11 which are upslope of unit 6/11.

There were no features recorded in the field notes for this unit, but the location of the Decatur projectile point in unit 6/11 was close to the two recorded in upslope unit 4/11. It is probable that the large Decatur working surface observed in units 4/9 plus 4/11 extended into unit 6/11 as a few similar heavy tools, smoothing stones and broken bifaces were recorded in levels 4 through 6 of unit 6/11. The general sequence of projectile points from excavation unit 6/11 indicated a mix or till of Middle Archaic and Late Archaic artifacts in levels 1 through 3, and a mix of Early Archaic material in levels 4 to 6. The lower levels are known to have been mixed as the Decatur point was found 2 levels above the later period Fort Nottoway point.

The estimated total number of flakes from this unit is 5,000, or an estimated 10,000 per 100 square feet. This is less than 25% of the number of flakes occurring 20 feet south in square 2/11 on the ridge top. The estimated total weight of all culturally related lithic materials is 60 lbs. (27 kg) or about 120 lbs. per 100 square feet. This is approximately 85% of that recorded in adjacent unit 4/11. However, compared to unit 2/11, on the ridge top, only 38% of that quantity was recovered per 100 square feet excavated. These values (estimated) clearly indicate the rapid decrease in total lithics observed in area B of Cactus Hill on the north slope away from the center of the ridge. Tables 5.45 and 5.46 present the artifacts recovered from unit 6/11 by level.

Table 5.45. 44SX202, CACTUS HILL, AREA B, ANALYSIS OF SQUARE 6/11

Level	Total Weight (lb.)	FCR (lb.)	Qte Flakes and Shatter #/wt (lb.)	Qu Flakes and Shatter #/wt (lb.)	Formal Artifacts (lb.)	Cobbles and Pebbles (lb.)	Cores (nonbifacial) (lb.)	Comments
1	4.5	2.0	179 1.3	41 0.2	0.95	0.05	--	Middle Archaic
2	11	6.5	277 2.39	43 0.25	1.5	--	0.36	Middle Archaic plus Late Archaic
3	8.4	6.1	121 1.03	24 0.23	0.25	0.19	0.63	Late Archaic
4	8.0	3.0	176 1.3	18 0.08	2.0	1.63	--	Early Archaic
5	7.0	1.6	143 1.9	13 0.16	1.95	0.18	1.2	No diagnostics
6	6.5	0.72	112 2.36	8 0.13	1.79	--	1.5	Early Archaic
7	0.84	--	51 0.69	5 0.015	0.09	0.05	--	No diagnostics
8	0.16	--	21 0.13	8 0.03	--	--	--	No diagnostics
Total	46.4 (21.1 kg)	19.92 (9.05 kg)	1,080 11.1 (5.05 kg)	160 1.095 (0.5 kg)	8.53 (3.9 kg)	2.1 (0.95 kg)	3.69 (1.68 kg)	Total flakes=1,240 Total wt= 12.2 lbs. (5.54 kg)

Notes: Weights are low - see text.
Qte=quartzite; Qu=quartz; #=number of flakes; wt(lb.)=weight in pounds; kg=kilograms

Table 5.46. 44SX202, CACTUS HILL, AREA B, SQUARE 6/11, FORMAL ARTIFACTS

Level	Key Artifacts/Number/Material
1	Projectile points (1): Halifax/1/qte; Bifaces/3/qte, Biface/1/qu; Edge worked flake/1/qte; Edged spall or core fragment/1/qte - roughly edged; Core or chopper/1/qte - coarse; Flake*: 1/silicified wood, 1/chalcedony - burned.
2	Projectile points (4): Halifax/1/qte, Savannah River - narrow blade/1/qte, Morrow Mt. II/1/qte, Stanly/1/qte; Bifaces/3/qte - narrow elongated ovals, Biface/1/Morrow Mt. II-like, Biface/1/qte - thin, final stage, Biface/1/qu - thin final stage, Biface/2/qte - fragments, Biface/1/qu - fragment; Side scraper/1/qte - roughly edged, Side scraper/1/qu - roughly edged.
3	Projectile point (1): Bare Island/1/qu; Biface/1/qte - thin final stage, Bifaces/2/qte - thick early stage - elongated; Wedge-like item/1/qu; Flakes*: 1/blue rhyolite.
4	Projectile point (1): Decatur/1/qte; Manuport/1/qte; Side scraper/1/qte - roughly edged; Flake knife/1/rhy.
5	No projectile points; Large edged flakes or core fragments/4/qte, 1/qu - very roughly edged tools.
6	Projectile point (1): Fort Nottoway/1/qte, Tip/1/qu - drill?; Biface/1/qte - large used as smoothing stone; Biface fragment/1/qte; Edge used flakes/2/qte; Cores/2/qte - large; Flake*: 1/blue oolitic quartzite.
7	No projectile points; Edge used flakes/3/qte; Flake*: 1/blue oolitic qte - same core as flake in level 6.
8	No Projectile points, no tools - flakes only, qte and qu.

Notes: *Flakes other than quartz and quartzite.
Qte=quartzite; Qu=quartz; arg=argillite; rhy=rhyolite; ss=silicified slate

Additional Excavation Units - Area B

The following excavation units in area B will be described in an abbreviated format. These units were typically downslope of the primary excavation units which have been described previously. In those instances where significant findings were made, such as for salvage excavation A (unit 0/9 and -1/9 on grid) level 5, which produced a Clovis hearth, more detail will be presented. Otherwise, the format for these units will be a brief description of the excavation technique and unit depth, a description of the diagnostic artifacts or a reference to the Appendix A tabulation, and an overall tabulation of the total weight of culturally associated lithics.

Excavation Unit 7/14

This 10 foot by 10 foot square was excavated in October 1993 in six levels of 2 inch thickness below a 6 inch plowzone downslope to the northwest of the ridge centerline. The unit, which was 18 inches in total depth, produced only 31 pounds of lithics, 17 pounds of which was fire cracked rock (hearthstones).

Diagnostic artifacts were recovered in level 1 only, and were two Savannah River points (wide blade) and a Susquehanna-like point, all three were of quartzite. There was no foreign lithic material in this unit. Weights recorded by level: level 1, 5.5 lbs.; level 2, 6.0 lbs.; level 3, 9.5 lbs.; level 4, 4.5 lbs.; level 5, 3.5 lbs.; and level 6, 2.0 lbs. No features were recorded. This unit was not recorded in Appendix A due to the very low diagnostic count.

Excavation Unit 0/8W (Southwest)

This 7 foot by 7 foot excavation was made upon the centerline to the southwest slope in June 1991 by NRS. The 6 inch plow zone was removed by hand and six levels of approximate 3 inch thickness were excavated. The total unit depth was 24 inches. This unit produced a total of 23 diagnostic projectile points/hafted bifaces and a chipped celt with a highly ground and polished blade. The celt appears to have been associated with the Early Archaic St. Albans tradition.

The distribution of diagnostics by level and lithic materials is presented in Appendix A. There was minor mixing of cultural materials in this unit, with level 1 producing Late Archaic artifacts; levels 2 and 3, Late Archaic to Middle Archaic with one intrusive Early Archaic artifact; level 4 producing primarily Early Archaic artifacts; level 5 producing no diagnostic artifacts; and level 6 producing two fire damaged Morrow Mountain II bifaces in the bottom of a fire pit. The total weight of lithics from this unit was recorded as 127.5 lbs. (58 kg), of which 53.5 lbs. (24.3 kg) was fire damaged hearth stone (FCR). This excavation unit was similar to units 0/5, 2/7, and 1/9, and appeared relatively undisturbed, although there was no well defined microstratigraphy.

Salvage Excavation Unit A, Positioned on the Grid as Unit 0/9 Plus -1/9W (Southwest)

This asymmetrical excavation unit was determined to represent approximately 80 to 85 square feet and was placed on the southern (southwest) slope of area B at Cactus Hill in mid 1994. The odd shape of the unit was dictated by the presence of excavations made by others, including relic collecting pits. While the unit was set up on 90 degree angles to the maximum extent possible, this resulted in some disturbed areas enclosed in the excavation plan.

This unit was excavated based upon information received from Mr. Tim Shelor, of Prince George Virginia who excavated a trench between this unit, and units 1/9 and 1/11 to the north. Relic collectors had dug pits to the east, west, and south of this area. Tim had recovered a yellow chert, Clovis-like, side scraper on a faceted core blade (Figure 5.39, item 3) in his trench, and informed NRS of this discovery and the potential of this area. We have no information on discoveries which may have been made by the relic collectors.

The 8 inch plow zone of this unit was stripped by hand, and 5 levels averaging 3.5 inches in thickness were excavated below this surface. The total depth of this unit was 26 inches. The lithics by level were recorded as follows: level 1, 25.5 lbs.; level 2, 37.5 lbs.; level 3, 51.5 lbs.; level 4, 38 lbs.; and level 5, 6.5 lbs. The unit total of 158.5 lbs. (72 kg) would be equal to approximately 200 lbs. of lithics for a 10 foot by 10 foot unit. Fire cracked rock (FCR) was present into level 5, but was insignificant below level 3. In levels 1, 2 and 3 FCR averaged 50% of the total weight of these levels of

114 lbs. In level 5, only 0.52 lb. of FCR were recorded which represented 8% of the total weight of this level.

Salvage unit A produced 23 diagnostic projectile points/hafted bifaces. Levels 1 and 2 produced a total of 14 Late Archaic and Middle Archaic period diagnostics. Level 3 produced 7 projectile points ranging in age from Middle Archaic to Early Archaic with one possible Late Paleoindian Dalton-like point. Level 4 produced only one Stanly-like point in a pit. Level 5, and the very lowest part of level 4 produced Clovis tools. A surface hearth was encountered in level 5 with, and below, Clovis tools and small chert trim flakes. The tools were of Williamson chert (Williamson Site quarry area, Dinwiddie County, Virginia), and Mitchell quarry chert, and a narrow fluted preform of red quartzite was found in level 5. The Clovis hearth, feature 0/9 plus-1/9-5-F1, was an oval scatter of carbonized wood approximately 20 x 14 x 1.5 inches deep (Figure 5.37 top). The contents of the hearth were collected as an upper zone 0.75 inch thick, and as a lower zone also 0.75 inch thick which contained less carbonized wood. The upper zone was submitted for dating and produced a corrected date of 9,790± 200 B. P. Remnants of the sample were determined by L. McWeeney (Appendix D(1)) to contain some partly carbonized wood (commonly found in many samples from area B of the site), as well as completely carbonized wood. The lower part of the feature (which was marked at position N-10W7 on the carbon sample grid - see McWeeney's report) was determined to contain completely carbonized hard southern pine and produced a corrected date of 10,920± 250 B. P. This represented our only acceptable date for Clovis from the Cactus Hill Site. This feature is shown as use area 8 of Figure 5.66.

A detailed analysis of the lithics from level 5 from salvage unit A revealed the following: 21 small fragments of FCR, weight=0.516 lb. (downdrift); 472 small pebbles, weight=1.42 lbs.; 158 quartz flakes/shatter, weight=0.559 lb.; 1,076 quartzite flakes/shatter, weight=3.72 lbs.; formal artifacts weight=0.3 lb.; 33 flakes of foreign materials, 15 of which were white chert and yellow-brown jasper.

Most of this material was considered to be downdrift from the upper Archaic levels, but some Clovis age debitage, primarily the chert flakes, also was recognized. Several of the white chert flakes were burned in the Clovis hearth.

Excavation Unit 2/12W (Southwest)

This 10 foot by 10 foot square was excavated in March 1993 by NRS on the south slope near the ridge centerline area B. The 6 inch plow zone was stripped by hand, and six levels were then excavated at an average thickness of 3.5 inches per level. A total of 35 diagnostic artifacts were recovered, and the lower levels produced six similar Clovis-like side scrapers of the same type of oolitic quartzite. This brown oolitc quartzite matched one of the fluted points from the site. This unit, therefore, was recognized as containing a lightly used Paleoindian working surface. This is shown as use area 9 in Figure 5.66. No Paleoindian projectile points were recovered in this unit.

Levels 1, 2, 3, and 4 of unit 2/12 produced 27 diagnostic projectile points of the Late and Middle Archaic periods. There was no culturally significant stratigraphy to the positioning of most of these artifacts, and significant intermixing or till was evident throughout the first three of four levels. Level 4 contained only Middle Archaic age material. Level 5 produced 8 diagnostic projectile points of the Early Archaic period and the six Clovis-like side scrapers. No diagnostic artifacts were recovered in level 6; however, debitage (downdrift) from the upper levels was recovered here. Appendix A presents the diagnostic artifacts by type and lithic materials for all levels. The total of 35 projectile points/hafted bifaces from this unit was quite high, and was supported by the total weight of lithics from this unit which was recorded as 271.5 lbs. (123.4 kg). This unit was excavated as an attempt to salvage some of this area of the site between large collecting pits to the east and west.

Excavation Unit 0/14W (Southwest)

This 13 foot by 9 foot unit was excavated by NRS in April 1994 near the ridge centerline in area B of Cactus Hill. The position (size and location) of the unit was a result of large adjacent collecting pits positioned to the east, south, and north. The 6 inch plow zone was stripped by hand and five levels averaging 3.2 inches in thickness were excavated below this level. The depth of cultural material below the plowzone in this area was only 16 inches, and this represented one of the more shallow areas of the site.

Unit 0/14 produced 42 diagnostic projectile points/hafted bifaces, and this large number is partly explained by the 117 square foot size of this excavation. Only five of the 42 diagnostic artifacts were of Early Archaic age, and most were of Middle Archaic age. This is shown in more detail in Appendix A. One large feature, a surface hearth which measured 20 x 22 x 3 inches deep, feature 0/14-2-F1 in level 2, produced 28 fragments of fire cracked hearth stone and nine Morrow Mountain II projectile points. The total weight of all lithics from this unit was 324 lbs. (147.3 kg), of which 61% was fire cracked hearth stone.

Level 2 produced 28 diagnostic artifacts and represented a till of Late and Middle Archaic material. Level 3 and level 4 produced a till of Middle and Early Archaic material. One possible Dalton point was recovered in level 3, which was out of position. This unit was typical of the very heavily utilized areas near the ridge centerline in area B. Only a very general cultural stratigraphy was observed.

Excavation Unit 2/16W (Southwest)

This 8 foot by 8 foot square was excavated by NRS in March 1993 on the ridge centerline downslope and to the southwest of the area of the primary excavations conducted in October 1993. A 6 inch plow zone was removed by hand, and three levels of average 4 inch thickness were excavated below this surface. The entire deposit was only 18 inches in depth at this location which marked the most shallow area on the ridge centerline on area B. There was more of a slope in the area of square 2/16W than normally observed on the ridge centerline. This short sloped area seemed to connect a flatter lower region (salvage excavation B plus C - southwest) on the slope centerline to a flat upper region (salvage excavation A and the 1/9+2/9 block of units - northeast).

The number of diagnostic projectile points/hafted bifaces (14) from this unit was abnormally low for an area of 80 square feet on the ridge centerline. Most of the diagnostic artifacts were recovered from levels 1 and 2 of the unit and were observed to be in the proper general sequence from Late Archaic to early in the Middle Archaic (LeCroy). No Early Archaic material was recovered which probably accounts for at least 3 to 4 inches of cultural deposit depth not present in this unit. The total weight of all lithics recovered in 2/16W was 72 lbs. (32.7 kg) of which 45.5 lbs. (20.6 kg) was FCR. No individual features were recorded and the hearth stones were a general scatter throughout levels 1 and 2. Large pits dug by artifact collectors were northwest and southeast of this excavation unit.

Salvage Excavation Unit D (Southwest Slope)

This unit undertaken in 1994 was a 5 foot by 5 foot square placed to the southwest of the primary excavations to the northeast of the ridge centerline. Salvage area D was surrounded by artifact collecting pits and was an attempt to salvage something of this area of the site. Unfortunately, the unit was looted after the plowzone and level 1 had been excavated. No data were recorded for this excavation below level 1. See Appendix B for Woodland artifacts recovered.

Excavation Unit 0/16W

A 7 foot by 7 foot square, designated unit 0/16W, was excavated in November 1993 by two students from a local university as a school project. Some of the resulting data was shared with NRS. As these individuals have stated their desire to publish their results in detail at a later time, we will simply make a few general observations and reference the data set for unit 0/16 in Appendix A of this work. One Paleoindian artifact, a very "Clovis-like" yellow chert end scraper, was recovered in level 5 of their excavation below a Palmer point. This find, which matched the stone material of the Clovis point in use area 3, is shown as part of Paleoindian use area 10 , Figure 5.66. This unit was excavated in six levels of 3 inch thickness below a 6 inch thick plowzone. The total depth of the cultural deposit was reported to be 24 inches. Diagnostic artifacts were reported from levels 1, 2, and 5, and represented a mixture of 16 identifiable projectile points from the Late, Middle, and Early Archaic periods. The total weight of lithics, and flake count, were not reported to NRS.

Excavation Unit 0/20W

Unit 0/20W was excavated by NRS in March 1993. This excavation was an 8 foot by 11 foot area placed just to the north of the ridge centerline in area B, and downslope 100 feet west from the starting unit 0/0. Unit 0/20W was observed to be on a slope just

above and north of the last flat or terraced area of the site before the steeper drop west to the river. This very shallow unit was excavated as three levels of average 4 inch thickness below a 9 inch thick plowzone. The plowzone was stripped by hand.

Level 1 produced only two Late Archaic projectile points, but it produced 8 Middle Archaic projectile points. Levels 2 and 3 produced 5 projectile points, and four of these were of Early Archaic age. In the lowest region of level 3, a well made jasper knife on a blade-like flake was recovered. This artifact was made of identical brown, yellow, and white mottled jasper as was the fluted point recovered in level 6 of unit 0/5 upslope. No artifacts or debitage were recovered below the knife. The location of the find of the knife is shown as part of Paleoindian use area 11 of Figure 5.66. Unit 0/20 produced a total of 15 diagnostic projectile points which is a fairly low number for a unit near the ridge centerline. This probably reflects the unit slope down and to the north. The total weight of all lithics recovered from unit 0/20 was 134 lbs. (60.9 kg) of which 55 lbs. (25 kg) was FCR (hearth stones). Site areas to the east, west and north of this unit were heavily damaged by artifact collectors.

Excavation Unit 3/20W (Southwest)

Unit 3/20W was a 5 foot by 5 foot square placed to the south of the ridge centerline at a location approximately opposite unit 0/20 to the north. The excavation was made by NRS in February 1993. Seven diagnostic artifacts were recovered in three levels averaging 4 inches in thickness. The top 8 inches was plowzone and was removed by hand. The total depth of the deposit was only 20 inches. Diagnostic artifacts represented the Late, Middle, and Early Archaic periods, and the sequence of excavated material was fairly accurate chronologically as shown in Appendix A. The total weight of all lithics recovered from this unit was 48 lbs. (21.8 kg), of which 25.8 lbs. (11.7 kg) was FCR (hearth stone). No features were recorded. This area of the site has been totally destroyed by looting.

Excavation Unit 0/22

This was a 9 foot by 8 foot excavation placed on a flat terrace 110 feet west and downslope, from the initial square 0/0 to the east on the hill top. The excavation was made by NRS in June 1992 in an area to the north of a large pit dug into the site by artifact collectors. The unit was excavated as five levels of 2.6 inch average thickness below a 6 inch deep plowzone. The plowzone was removed by hand. Level 1 produced no diagnostic artifacts, but a surface hearth, feature 0/22-1-F1, with 2 FCR and dimensions of 19 x 13 x 2 inches was recorded. This feature was in the west end of the square, and directly east of this feature, in the unit wall, was a Middle Woodland pit, feature 0/22-1-F2, which contained Stony Creek cord marked sherds and a broken two-hole, black slate gorget. Level 2 produced five diagnostic artifacts of Middle Archaic age, including two Stanly points and a round base hafted Stanly knife. A pit hearth bottom, measuring 12 x 10 x 3 inches deep, was recorded as feature 0/22-2-F1 in the northeast corner of the unit.

Level 3 and level 4 produced two St. Albans points and six Fort Nottoway points around a dark reddened hearth-like area (feature 0/22-4-F1) in the southeastern area of the unit. The hearth-like area measured 32 x 27 x 2 inches and contained some carbonized material and burned flakes. It appeared that the hearth area, or at least this spot on the site, had been used by people of both the St. Albans and Fort Nottoway traditions in the same general time period. Level 5 produced only the tip of a small Decatur or Palmer-like projectile point, but nothing diagnostic.

This area of the site was quite shallow with a total deposit depth of 19 inches. The 72 square feet (6.7 square meters) encompassed within the excavation produced a total of 117 lbs. (53.2 kg) of lithics of which 47 lbs. (21.4 kg) was fire cracked rock. The 40.2% FCR is a low percentage for this area of the site. Overall, the sequence of artifacts from unit 0/22 was extremely accurate, based upon the observed and accepted sequence from area D of the site. This area of the site now has been completely destroyed artifact collecting.

Excavation Unit 4/22W (Southwest)

The most westerly located of the excavation units on the terrace above the river in area B on Cactus Hill was square 4/22. This 9 foot by 9 foot unit was excavated in a wooded area in six levels of approximate 4.5 inch thickness below an 8 inch thick root mat and plowzone. The total depth of the cultural deposit in this area was 36 inches, and was the deepest deposit investigated near the ridge top in

area B of the site. The soil here was very sandy, and seemed to lack the high silt content noted just 20 feet upslope. The depth of the deposit in this unit reflected a downward slope on the ridge. Levels 1 through 3 produced 15 projectile points in fairly good sequence from Late Archaic through early Middle Archaic. A zone of sterile sand 2 to 3 inches thick separated level 3 artifacts from a light scatter of Palmer period material in level 5.

Overall, unit 4/22 produced 16 diagnostic projectile points over 81 square feet. This is a fairly low artifact count for the ridge centerline area, and reflects the less desirable downslope location. The quantity of Early Archaic material was low, while the quantity of Late Archaic Savannah River material and FCR (hearth stone) was high. A concentration of Kirk Serrated material also was present in this area. The total weight of lithics from this unit was 124.5 lbs. (56.6 kg) of which 80 lbs. (36.8 kg) was FCR. This entire area of the site had been destroyed by looters as of December 1995. This excavation and a small excavation made here by Johnson in April 1995 represent all of the data recovered in this downslope area.

Salvage Excavation Units B and C

These two connected asymmetrical excavation units were excavated by NRS in late May and early June, 1994. They were placed to the center of an area with large relic collecting pits to the southeast and northwest in an attempt to salvage something from this lower ridge centerline area. The units were observed to represent a flat or terrace location on the lower ridge centerline.

The total area excavated was 227.5 square feet which represented 117 square feet in salvage unit B and 110.5 square feet in unit C. Some of the edge locations in both units were disturbed soil from the relic pits, but the central regions of these units were undisturbed. Because of the continuing severe looting problem at the site, both units were excavated over a period of two weeks by a group of four volunteers.

Unit B produced 346.3 lbs. (159.4 kg) of lithics, and unit C produced 246 lbs. (111.8 kg). Evaluated as units of to 100 square feet, the units B and C would have produced 296 and 223 lbs. of lithics respectively. Unit B contained 204.3 lbs. (59% of total lithics) of FCR hearth stones, while unit C contained 128 lbs. (52% of lithics) of FCR. There was a slope to the modern surface of unit C, but unit B was relatively flat and represented the edge of the lower terrace adjacent to a steeper drop toward the river.

The total weight of lithics was quite high for these two units and was a direct reflection of the desirable location and surface contour of this area of the site.

Unit B was excavated as six levels approximately 3 inches thick below an 8 inch thick plowzone removed by hand. The total unit thickness was 26 inches. Unit C was excavated as five levels approximately 4 inches thick below an 8 inch plowzone, also removed by hand. The total thickness of this unit was 28 inches. Salvage unit B produced 58 diagnostic artifacts (projectile points/hafted bifaces), and unit C produced 33.

This lower terrace on the ridge centerline was identified as a major site use area. Taken together, these two units represent a fairly complete picture of the typical diagnostic artifact types recovered on this site, and they are shown, with a few other tools, by detailed drawings (Figures 5.43 and 5.44). Both units represent a till of Archaic age materials, with the two upper levels producing a mixture of primarily Late Archaic and Middle Archaic artifacts, and the lower two levels Middle Archaic, Early Archaic, and Paleoindian age artifacts. Level 4b and level 5 of salvage unit B produced a Clovis point and Early Paleoindian (?) triangular point respectively. The disturbance and downdrift in these lower levels appeared minimal, and the stratigraphic relationship between two biface types seems correct.

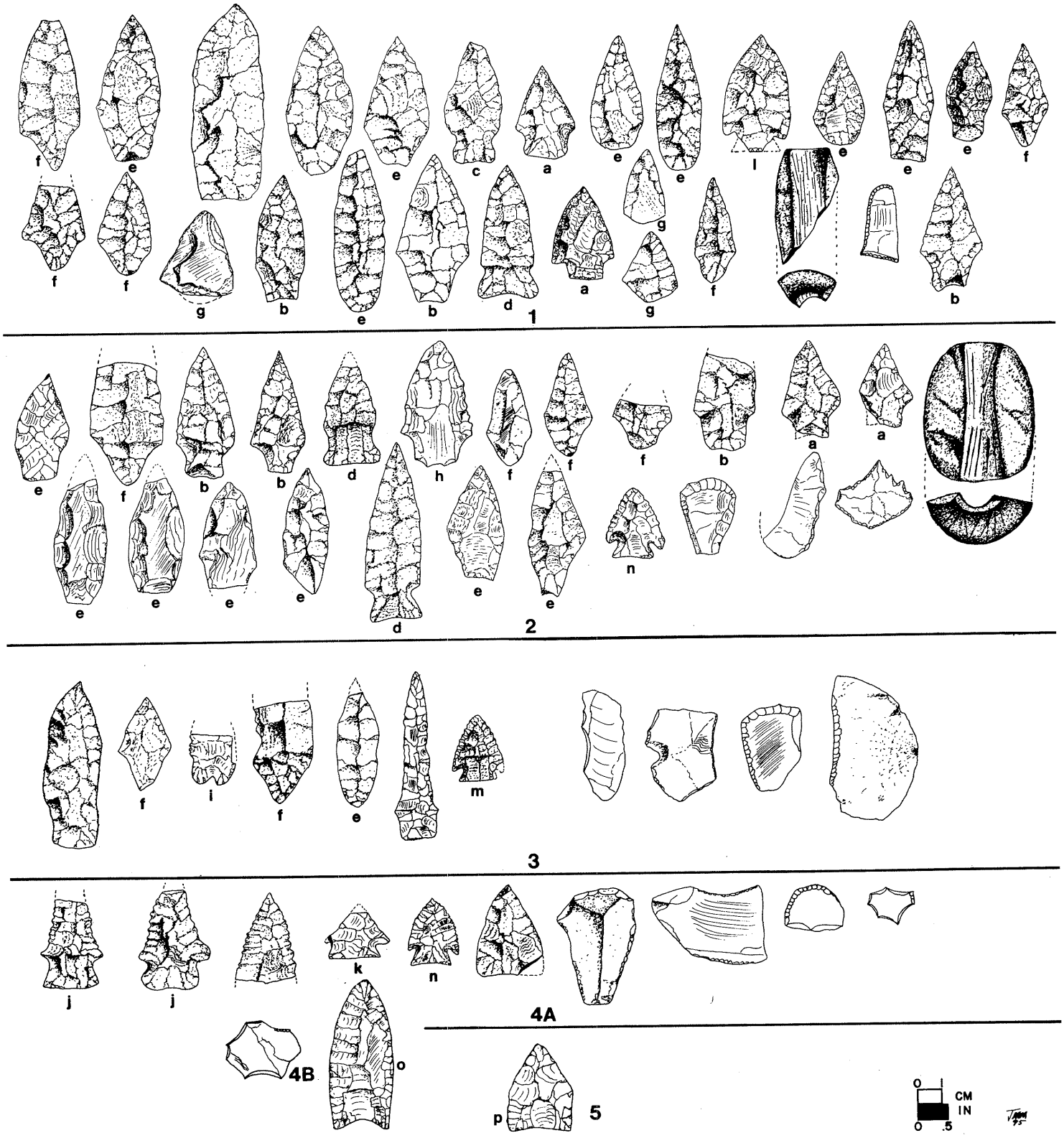


Figure 5.43. Artifacts from levels 1 through 5 of excavation salvage unit B. a, small stemmed; b, Savannah River narrow; c, Halifax; d, Rowan; e, Guilford; f, Morrow Mt. II; g, Morrow Mt. I; h, Kirk Serrated; I, LeCroy; j, Kirk Stemmed; k, Decatur; l, Kirk Corner-Notched; m, Palmer corner notched; n, Palmer, deep notched; o, Clovis; p, Early triangular.

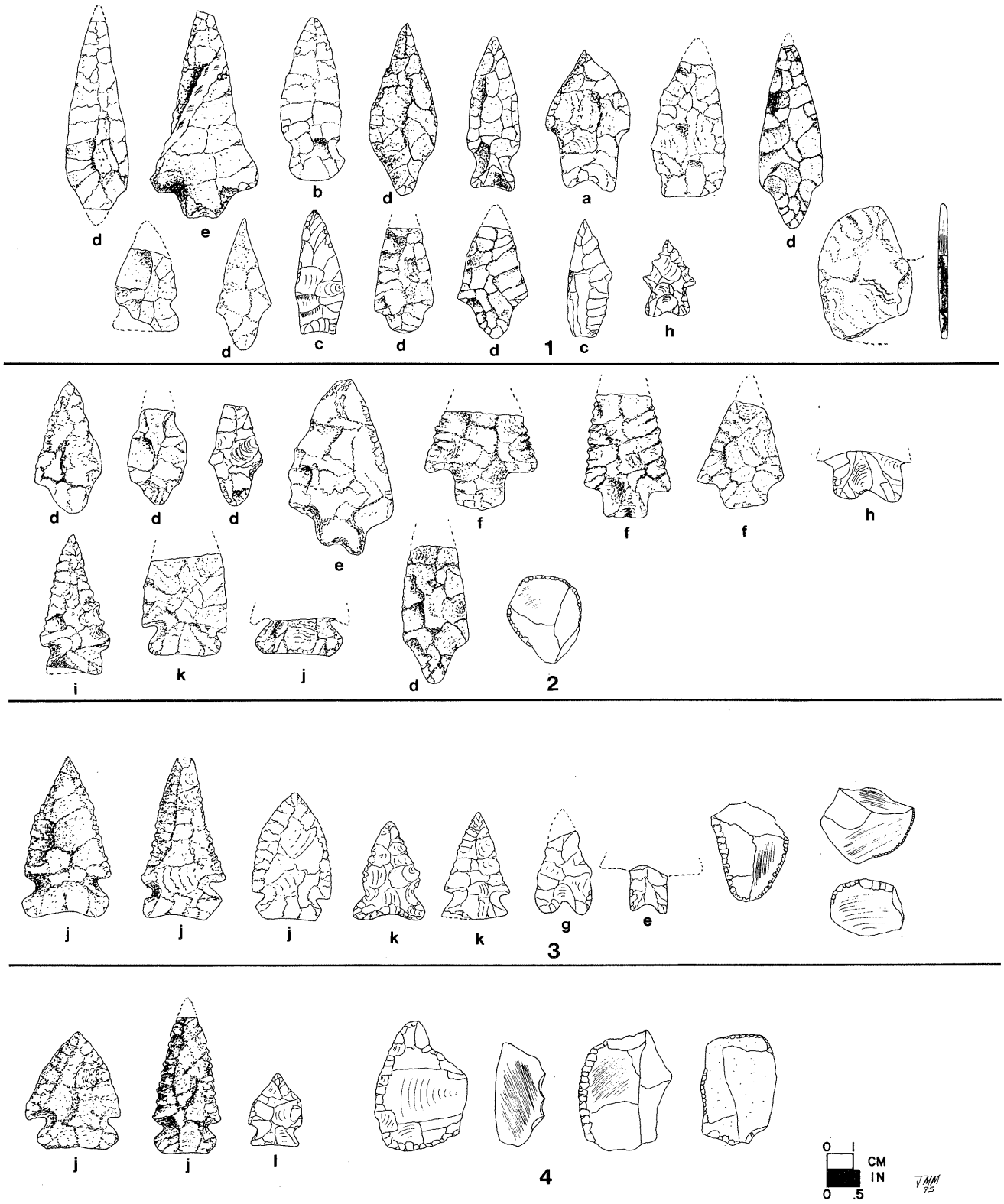


Figure 5.44. Artifacts from levels 1 through 4 of excavation salvage unit C. a, Savannah River wide; b, Lamoka-like; c, Guilford; d, Morrow Mt. II; e, Stanly; f, Kirk Serrated; g, LeCroy; h, St. Albans; I, Kirk Stemmed; j, Fort Nottoway; k, Kirk Corner-Notched; l, Palmer corner notched.

Detailed tabulations of the projectile point types by level and lithic materials for salvage units B and C are presented in Appendix A.

Several items of interest concerning these two excavations, beside the Paleoindian point finds noted above, should be discussed. Unit B produced a single tubular atlatl weight fragment in level 1, and a single fragment in level 2 from two separate siltstone weights (Figure 5.43). Both items were from atlatl weights of similar size, and both are similar to one green serpentine fragment recovered eroding from the sand pit wall near area D, apparently with Morrow Mountain II projectile points. Only four atlatl weight fragments have been recorded from this site - the three tubular shaped weight fragments (described above) recovered by NRS, and a broken half section of a thick wing shaped weight recovered by Johnson in area A. Atlatl weights are rare on this site, and rare upon all of the Nottoway River sites in this area.

Unit B produced one feature of interest. In level 2 and extending slightly into level 3 a circular fire cracked rock hearth (Figure 5.45) was encountered as feature Ex.B-2/3-F1, near four shouldered Guilford projectile points. Carbonized wood from the hearth produce a 14C date of 4,980 ±170 B. P. which probably represents an intrusive Halifax feature from level 1 or 2 into a Guilford working surface low in level 2.

Unit C, levels 3 and 4, produced a Fort Nottoway period working surface (Figure 5.46) which also contained a surface or basin hearth. Five Fort Nottoway points (two fire reddened), tools, bifaces and cores were recovered from this feature, which was designated Ex.C-3/4-F1, and appears to have been oval with dimensions of approximately 50 x 35 x 4 inches deep. The last (deepest) levels in units B and C were relatively undisturbed by later site use. These units were quite typical of the areas of heavy site use on the ridge centerline at area B on Cactus Hill.

Downslope to River, Test Units 3/34, 3/44, and 3/52

In October 1993 three test units were placed downslope toward the river from unit 0/0 at distances of 170, 220, and 260 feet (Figure 4.1). These excavation units have the designations 3/34, 3/44, and 3/52. The test units were small with dimensions of 6 feet by 6 feet for unit 3/34, 5 feet by 10 feet for unit 3/44, and 5 feet by 10 feet for unit 3/52. Each unit was excavated to a depth of one level below cultural lithics. Only unit 3/34 produced a diagnostic projectile point/hafted biface, and this was an unidentified thin stemmed or side notched point in level 9 of the 12 levels.

The recorded cultural materials from these excavation units are presented as follows in an abbreviated format due to the low number of diagnostic artifacts recovered:

Unit 3/34 was on the slope to the river and was dug in 12 levels. Thickness was 2 inches per level below an 8 inch thick plowzone, with a total thickness or depth of 32 inches.

Level 1, 0.016 lbs., flakes plus a ceramic sherd (see Appendix B)

Level 2, 0.031 lbs., flakes

Level 3, 0.88 lb., flakes, FCR, plus a ceramic sherd (see Appendix B)

Level 4, 0.36 lb., flakes, FCR no formal artifacts

Level 5, 0.42 lb., flakes, FCR, no formal artifacts

Level 6, 0.094 lb., flakes, no formal artifacts

Level 7, 1.59 lbs., flakes, FCR, no formal artifacts

Level 8, 0.79 lb., flakes, FCR, no formal artifacts

Level 9, 2.1 lbs., flakes, FCR, Notched/stemmed projectile point/hafted biface - quartz

Level 10, 2.05 lbs., flakes, FCR, no formal artifacts

Level 11, 1.48 lbs., flakes, no formal artifacts

Level 12, 0.0 lb., no cultural materials

Total wt.=10.22 lbs. (4.65 kg)

Unit 3/44 was also on the slope to the river and was dug in five levels below a 6 inch plowzone. Level thickness was 3-4 inches per level with a total depth of 22 inches below the surface.

Levels 1-3, 1.08 lbs., flakes, FCR, broken in-process early stage bifaces intermixed with iron nails, long bolts and modern sawmill debris, ceramic sherds (see Appendix B).

Level 4, 6.45 lbs., flakes, FCR, broken in-process bifaces

Level 5, no recorded lithics

Total wt=7.53 lbs. (3.42 kg)

Unit 3/52 was on the first terrace above and very near the river, and it was dug in one 6 inch level below a 6 inch plowzone. Below level 1, the sandy soil coarsened into small gravel at 18 inches below the surface. There were no cultural lithics below level 1.

Level 1, 14.4 lbs., flakes, FCR, broken in-process early stage bifaces, ceramic sherds (see Appendix B).

Site Use Areas by Tradition - Area B

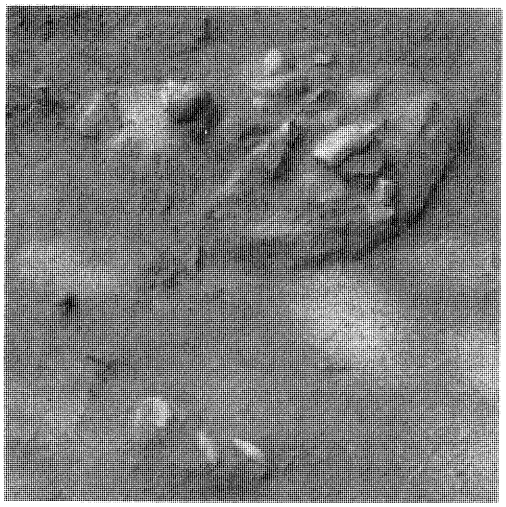
Based upon the excavation units in area B at Cactus Hill discussed in the above section and presented in Appendix A, culture or tradition use area drawings have been constructed. These use area drawings appear among Figures 5.47 through 5.66.

Some of these drawings were referenced from the previous culture sequence section for area D. Others were not previously referenced as they represent diagnostic artifact types or temporal markers recovered only in area B. This section discusses these use areas in their approximate chronological sequence. Some of the diagnostic artifact types presented in Appendix A occurred in such small numbers that meaningful observations, as to use area, were not possible. These projectile points/hafted biface types included: Type 1, large triangular (n=1); Type 2, thin side notched (n=1); Type 3, tapered stemmed (n=1); Type 4, fishtailed (n=1); Type 5, Perkiomen (n=1); Type 6, Island Swamp (n=2); Type 12, Lamoka-like (n=2); Type 22, Kanawha-like (n=3); Type 26, Kirk Side-Notched (n=2); Type 29, Plevna (n=0 in area B, n=2 in area D); and Type 34, Dalton-like (n=2). Other types defined in this work as small Stanly-like, and Sharp's Mill Kirk Serrated were included within the primary description type for use area analysis.

The following types as defined in Appendix A were encountered in numbers, or circumstances, sufficient to define use areas: Type 7, small stemmed (n=21); Type 10, Bare Island (n=22); Type 8, Savannah River wide blade (n=15); Type 9, Savannah River narrow blade (n=24); Type 11, Slade (n=13); Type 13, Halifax (n=36); Type 14, Rowan (n=11); Type 15, Guilford (n=84); Type 16, Morrow Mountain II (n=107), Type 17, Morrow Mountain I (n=33); Type 18, Stanly (n=9), Type 19, small Stanly-like (n=3); Type 20, Kirk Serrated (n=20); Type 21, Sharp's Mill Kirk Serrated (n=3); Type 23, LeCroy (n=9); Type 24, St. Albans (n=18); Type 25, Kirk Stemmed (n=10); Type 30, Kirk Corner-Notched (n=15); Type 27, Fort Nottoway (n=32); Type 28, Decatur (n=9 in area B, n=19 in area D); Type 31, Palmer (n=24); Type 32, deep notched Palmer (n=3); Type 33, Hardaway Side-Notched (n=1); Type 35, Middle Paleoindian (?) fluted projectile points (n=3); Type 36, Clovis fluted projectile points (n=1), and Type 37, Early triangular (n=2).

Type 7, small stemmed is included on the same drawing with Type 10, Bare Island, Figure 5.47. Five use areas were defined for the Type 7, small stemmed points. These use areas were on the ridge centerline, and they represent areas of approximately 100 to 200 square feet. The general appearance of these use areas was small isolated campsites. The excavation units and levels in which the points (numbers) occurred are noted in detail in Appendix A and summarized here: salvage excavation B, level 1 (2), level 2 (2); excavation unit 0/14, level 1 (1), level 2 (4); excavation unit 2/12, level 1 (3); excavation unit 2/7, level 2 (1), level 3 (1); excavation unit 0/5, level 3 (1), level 4 (1). The stratigraphic position of these points in the excavation units suggests a Late Archaic time period, but the fairly low integrity of the vertical positioning of artifacts in area B of Cactus Hill allows no further analysis of relative age. The four points from salvage excavation B are shown as drawings in Figure 5.43. The small stemmed type resembles the Iddins type (ca. 1,500 B. C.) reported by Chapman (1981) on the Little Tennessee drainage.

The Bare Island point (Ritchie 1961), Type 10 is similar in general shape to the small stemmed, but is a larger point. The spatial distribution of these points also is shown in Figure 5.47. Bare Island points occurred over a continuous area of 500 to 600 square feet in a north-south orientation centered around excavation units 2/9 and 2/11. They were not normally recovered in the same excavation units with the small stemmed points, which seems to support



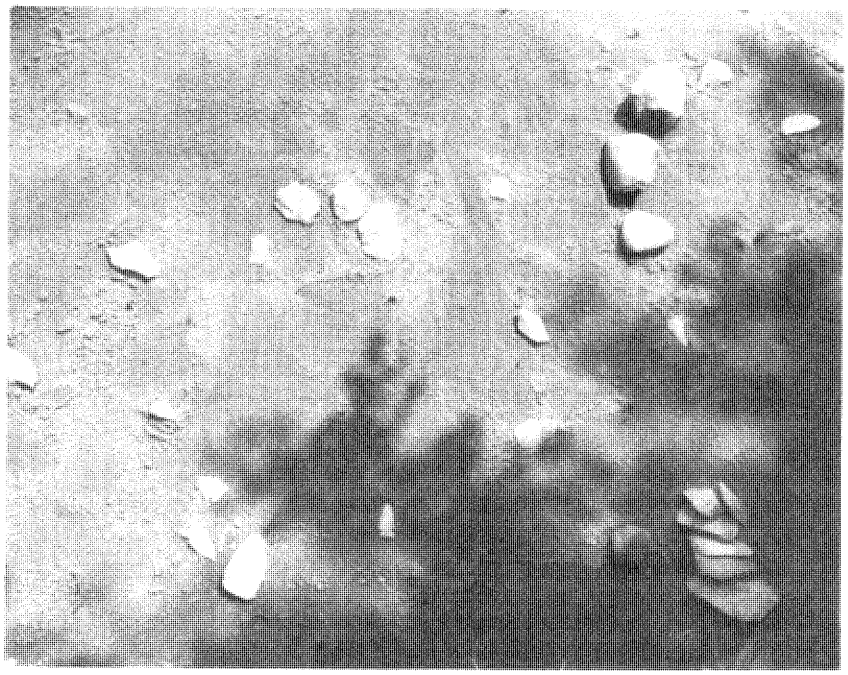


Figure 5.45. Excavation salvage unit B, level 2/3, Guilford surface hearth looking north (top) and south (bottom).

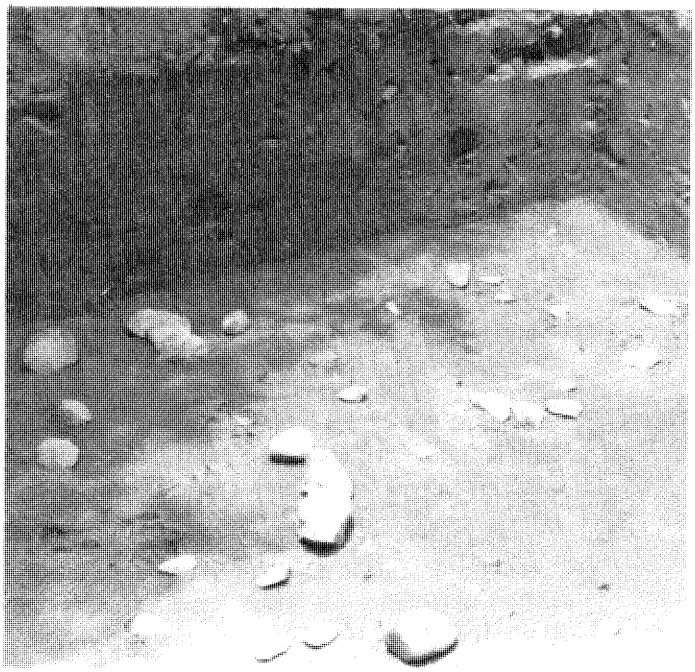


Figure 5.46. Excavation salvage unit C, levels 3/4, Fort Nottoway working surface with five projectile points, cobble cores, early stage bifaces, hammerstones, and a cache of large flakes. Top looking down, bottom looking west.

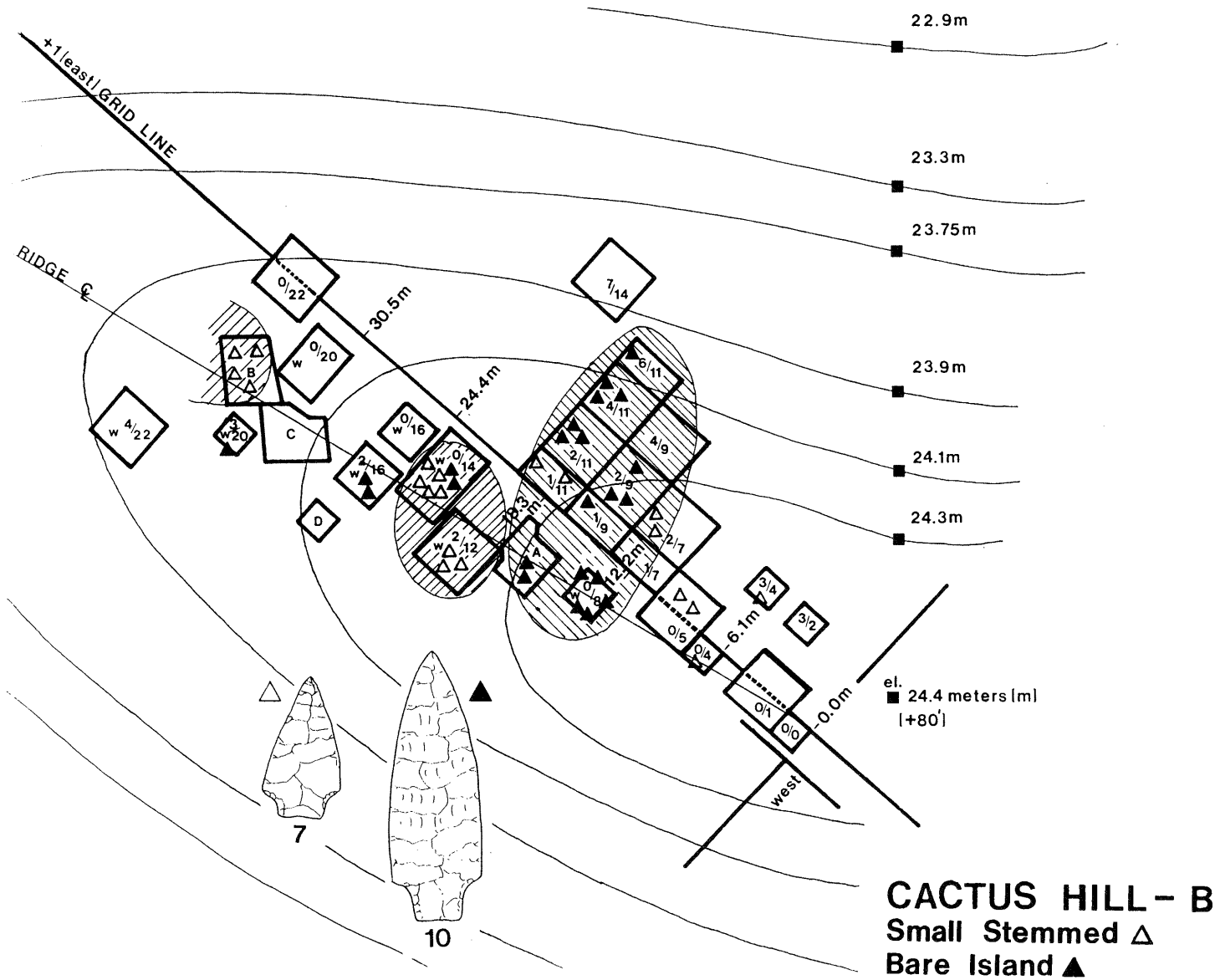


Figure 5.47. Cactus Hill area B excavations, small stemmed and Bare Island traditions use areas.

the position that the two types are unrelated. A review of the Appendix A data for the excavation units producing most of the Bare Island points (units 2/9, 2/11, 4/11, and 0/8), shows the relative depth in most excavations to be fairly inconsistent except for excavation unit 0/8. Unit 0/8 suggests a Late Archaic position for this type. Neither the small stemmed or the Bare Island point type was recovered in the major excavations of October 1993 and 1994 in area D of the Cactus Hill Site.

Type 8 and Type 9, Savannah River wide blade and narrow blade respectively were combined together for analysis of the general type on the same drawing with the Slade point, Type 11, Figure 5.48. From an analysis of the data of Appendix A, it was determined that Savannah River wide blade (SRW) occurred in area B in 12 of 26 total units, and occurred in 5 units with Savannah River narrow blade (SRN), and in 6 units with Slade. However, the Slade type occurred in 11 units, and the SRN also occurred in 11 units, but they occurred together in only 3 units. Only 5 of 26 units produced none of these three types, and 4 of these 5 units were small (approximately 25 square feet). The significance of this is that broad blade points seem to occur frequently with the narrow blade or Slade types, but the narrow blade and Slade types do not occur together as often. It is unknown at this time whether these data are chronologically significant, or merely reflect problems with typology. The three point types are represented by 54 points total (counting square 7/14 which is not in Appendix A). There is a fairly general scatter of these points across area B, with combined use areas of 600 to 900 square feet. Most of these points were recovered in the upper two levels of the excavation units, often around small hearths. There is no consistent difference in recovery depth of the three types which might serve as an indication of relative age. Based upon the Cactus Hill data, these types can be classified only as Late Archaic.

The Bare Island point (Type 10, previously discussed) also seems to fit into the Late Archaic age group cluster and occupies two of the major use areas occupied by the other types.

The largest concentration of the two Savannah River types appears to have been around excavation units 4/22 and salvage excavation B to the western end of the site near the river. Still, Cactus Hill would be considered only an average size Savannah River period site by comparison with other sites (such as Slade or Fannin) on the Nottoway River. The fairly narrow ridge defined as area B at Cactus Hill may not have been an adequate site for a large, long term Late Archaic settlement, and it appears that this is reflected in the excavation data.

Site size restriction may be an adequate explanation for limited space use of area B, but area D has produced even less Late Archaic material and site size restriction should not have been a problem here. Site use areas on Cactus Hill, for Late Archaic traditions producing a dense concentration of diagnostic artifacts, debitage and hearth stones, are more restricted in size and number than are the heavy use areas for some of the Early Archaic traditions. This was an unexpected finding, and appears consistent based upon NRS data for areas B and D of the site.

Type 13 Halifax and similar Type 14 Rowan, are shown on the same drawing, Figure 5.49. The area B Halifax tradition use areas were discussed previously in the area D excavation analysis section. Rowan points, Appendix A Type 14, were not recovered in area D, but 11 fairly good examples were found in area B. Two locations, excavation unit 0/14 and salvage unit B, produced 7 of the points. These two occurrences were small clusters with hearth stone in the immediate area. In unit 0/14, the four examples were from level 2 (2) and level 3 (2), and may have been associated with a pit hearth. The salvage unit B examples were from level 1 (1), and level 2 (2), and are shown as drawings in Figure 5.43. The excavated position of these artifacts is consistent with the Middle Archaic, but there was no observation of a direct association with similar shaped Halifax points which are thought to be of similar age. The occurrence of this point type on the Nottoway River is much rarer than the occurrence of Halifax points, and upon Cactus Hill the individual use areas associated with Rowan are no more than 100 square feet. Such use areas probably represent small transient camps and are very small in comparison with the size of Halifax use areas.

Type 15, Guilford, use areas are shown as Figure 5.50. The use areas of this tradition were discussed earlier in the area D analysis under the general Morrow Mountain section. One of the areas of heavy Guilford point concentration in area B was salvage

unit B, and the Guilford points from this excavation are shown by drawings in Figure 5.43. There are several forms of this point type including round base, flat base, concave base and weakly shouldered.

Type 16, Morrow Mountain II; and Type 17, Morrow Mountain I: Figures 5.51 and 5.52 show use areas for these traditions. Area B use areas for these two traditions were reviewed previously in association with the area D analysis. Morrow Mt. II and I points from salvage unit B are shown as drawings in Figure 5.43.

Type 18, Stanly; Type 19, small Stanly-like; Type 20, Kirk Serrated; and Type 21, Sharp's Mill Kirk Serrated: shown by use areas in Figure 5.53. Area B use areas for Stanly and Kirk Serrated were reviewed previously in association with the area D analysis. The three small Stanly-like (Type 19) points were considered with the general Stanly type. The location of recovery of two of the three points was unit 2/7 which did not produce a large Stanly type. The third example was recovered some distance away in unit 0/20 adjacent to salvage unit C which produced two Stanly points. No use area observations could be made for the small points. The three Sharp's Mill Kirk Serrated points (Type 21) were recovered low on the slope to the river in units 0/20 (1), 3/20 (1), and 4/22 (1), over a distance of approximately 30 to 40 feet. This general area of the site also produced a number of typical Kirk Serrated points, and was identified as one of two major use areas for the Kirk Serrated tradition.

Type 23, LeCroy; and Type 24, St. Albans: Figure 5.54 shows use areas for these traditions. Area B use areas for these two traditions were reviewed previously in association with the area D analysis. Four use areas were identified with St. Albans and two with the LeCroy tradition.

Type 25, Kirk stemmed; and Type 30, Kirk Corner-Notched: Figure 5.55 shows the use areas for these two traditions. Both traditions were generally discussed in the area D analysis but neither tradition was well represented in area D. They have been placed on the same drawing for area B to investigate the relationship between the two types. Enclosed areas highlighted with horizontal lines represent the cluster use areas of Kirk Corner-notched, and diagonal lines the Kirk stemmed use areas. Six general use areas were identified, ranging in size from approximately 10 feet by 10 feet to 25 feet by 25 feet. The use areas associated with Kirk Corner-Notched may be larger, but this is not clear. Expressed as a ratio of Kirk Corner-Notched to Kirk stemmed projectile points, the six use areas from east to west produced the following ratios: 0:2; 4:4; 1:2; 3:1; 3:0; and 5:3. Therefore, there is an overlap of the two point types in 4 of 6 use areas. A use area is defined as 2 or more points in an area of 100 square feet or less. This is a fairly high number of overlaps considering that the combined number of points of both types is less than 30. The number of overlaps seems to indicate a commonality between the two types, and it is possible that many of the points in the Kirk stemmed type, as defined on Cactus Hill, are resharpened forms of the Kirk Corner Notched. The use areas for the two Kirk traditions closely match the Fort Nottoway use areas, but not the Decatur use areas.

Type 27, Fort Nottoway: Figure 5.56 shows the use areas for this tradition. Area B use areas for Fort Nottoway were reviewed previously in association with the area D analysis. Six use areas were recognized, and some information related to use areas 3, 4, and 5 was provided by others working on the Cactus Hill Site in 1993 and 1994. Fort Nottoway points are shown in Figure 5.57.

Type 28, Decatur: Decatur points are shown in Figure 5.58. Figure 5.59 shows the use areas for this tradition. Area B use areas for Decatur were reviewed previously in association with the area D analysis. Three use areas were recognized producing a total of 13 projectile points (9 recovered by NRS), and some information on use areas 1 and 3 was provided by others.

It is interesting that in area B of the site, Decatur and Fort Nottoway use areas generally do not overlap. Overlap was noted in area D, but in area D there was as much as 2 to 3 inches of sand separating the working surfaces of these traditions in some excavation units. Site build rates, or sand accretion rates, in area B of the site were generally lower than in area D, and may not have resulted in complete coverage of earlier debitage in area B during the 50 years to 300 years probably separating the two traditions.

Type 31, Palmer; and Type 32, Deep Notched Palmer: Figure 5.60, shows the combined use areas for these traditions. The Palmer tradition use areas in area B were generally described in the area D

analysis section of this chapter. Four major use areas were identified in area B of the site, and the NRS received significant information from one other investigator to help define these areas. All of the Palmer use areas are clustered near the ridge centerline (±20 feet). While isolated point finds were recorded, most of the 44 Palmer points recorded on Figure 5.58 (based on all available information) were in clusters. Use area 4 produced 9 points, use area 3 produced 13 points (8 in a small area), use area 2 produced 5 points in a small area, and use area 1 produced at least two tight clusters of 3 and 5 points.

Generally, the clusters of points were of either the flat base type (31a) or the convex base type (31b) as follows: use area 1 - flat base type (31a); use area 2 - 4 of 5 were the convex base type (31b); use area 3-10 of 13 were convex base (type 31b); use area 4 - 7 of 9 were flat base types (31a). There was little intermixture of the two Palmer point types, and it is possible that they represent two separate traditions, perhaps separated by several hundred years.

The deep notched Palmer type generally fell within the flat to concave base definition in area B, but was more like the convex base form in area D. On Cactus Hill, most of the numerous convex base Palmers were made of fine grain quartzites, while about 50% of the rarer flat base Palmers were observed to be made of chert, jasper or rarely the metavolcanics. The maximum use area (size) for both types on area B of the site appears to be encompassed in a block about 30 feet by 30 feet. Palmer points are shown in Figure 5.61.

Type 33, Hardaway Side-Notched; and Type 37, Early Triangular: these two traditions were plotted together as Figure 5.62. Neither type was recovered in area D, although the Hardaway Side-Notched type was recovered in area A of Cactus Hill. Half of the data concerning Hardaway Side-Notched in area B was supplied by one other investigator, and represents one location which produced two artifacts together. They were recovered between NRS units 2/7 and 3/4. NRS recovered one Hardaway Side-Notched point in unit 3/4, but there were few associated artifacts. The artifacts associated with this tradition from the ridge at excavation area B are shown as Figures 5.63 and 5.64. The artifacts which were recovered in controlled excavations are presented in Table 5.47. These artifacts are notched bifaces, an unnotched triangular knife (?), and several scrapers. See Johnson's work in Appendix G for other data concerning this tradition. The two apparent use areas in area B (1a and 2a) are easily encompassed within 10 foot squares, and are separated by 20 feet. They are about 15 feet north of the modern day centerline of the ridge.

Type 37, Early Triangular, an early Paleoindian point type (?), was plotted with the late Paleoindian Hardaway side-notched type in Figure 5.62 to determine if the use areas were related. While an Early Triangular point was excavated in one square (salvage excavation B) below a Clovis point, and in another square (2/7) below Clovis-like unifacial tools, the appearance of this biface form is similar to an unnotched Hardaway side-notched point. The two were thought possibly to be related. The use areas of the two traditions do not overlap, but they may be separated by no more than 15 feet in one and possibly two cases (squares 0/5 and 2/7).

The artifact types recovered below Clovis-like points and tools in several excavation units (salvage B and C, 0/5, 2/7, 2/9, and 2/11) include two thin triangular lanceolate bifaces, polyhedral blade cores, core blades, edge worked and edge used flakes, and abrading stones. This group of artifacts, Figure 5.65, either may be directly related, or related only in their common location of excavation below Clovis. Clovis age artifacts generally are made of different lithics materials and are of different form than the early triangular "assemblage". It cannot be proven at this time, however, that at least some of these artifacts are not of Clovis age or perhaps even later.

The single hearth-like feature below Clovis in square 2/9, which produced a pre-Clovis date, has not yet been duplicated (as of this writing in 1995). Still, no other period/tradition on Cactus Hill produced an assemblage of artifacts which are exactly of the type associated with the early triangles. It may not be appropriate at this time to define a pre-Clovis (or concurrent with Clovis) tradition on Cactus Hill based on these data, but other excavations are planned which may add to the data base.

The use areas associated with the Early Triangles and the blade cores/core blade tools appear to be no larger than 10 to 15 feet by 10 feet, and they were found in some of the areas of the site where Clovis artifacts also were recovered. The Early Triangles were recovered in area B within ± 20 feet of the ridge centerline. More discussion on this discovery

appears in summary Chapter 7.

Type 35, Middle Paleoindian (?) fluted projectile points; and type 36, Clovis fluted projectile points: Figure 5.66, presents the distribution (use areas) of these artifact forms from area B on Cactus Hill. The division of the fluted point tradition into at least two projectile point forms and presumably two temporal periods is based upon stylistic and lithic considerations. Also, the use area (cluster) data tend to support the division. There are no stratigraphic data to support this division as the accretion rate of area B of the site was slow, and no distinct depth differences were noted. It is unlikely that the age difference is more than 500 to 700 years at the most extreme range which reasonably could be postulated (11,200 B. P. to 10,500 B. P.). The Clovis points and Middle Paleoindian fluted points from area B are shown natural size in Figure 5.67.

The Clovis fluted points (Type 36) from Cactus Hill are represented by two points recovered by another investigator in use area 3 of Figure 5.66, a resharpened reject stage Mitchell chert example and the tip of a large green metavolcanic point. All of the Clovis artifacts are presented in Table 5.48, except the preform discussed below from use area 2 which was unavailable. Use area 3 also produced several edge worked blade-like flakes associated with the points, and the total area in which this assemblage was recovered was reported to be approximately 25 to 50 square feet. A large Clovis preform of a rust red chalcedony or chert was found in adjacent use area 2, but the collector who excavated this artifact reported no other Clovis tools, and he has subsequently left this area of Virginia. The artifact was unavailable for measurements and photography. A Clovis-like graver and an end scraper were recovered in use areas 4 and 5 respectively. A Clovis point of white quartz was recovered in use area 11 within 10-15 feet of a jasper knife. A large Clovis point of Williamson chert was recovered earlier (1987) in area A.

These artifacts were isolated tools, or occurred with a few flakes or other typical Clovis tools in areas of no more than 25 to 50 square feet, and they probably represent only small transient camps or work areas for tasks of short duration. The Clovis points appeared to have been fairly large and ranged in thickness from 7 to 10 mm; most were made of lithic materials known from the local Fall Line region on the Nottoway River. Use area 8 which produced the Clovis hearth (see the salvage excavation unit A report) was defined on the basis of Clovis tools of local Fall Line materials (Williamson chert and Mitchell chert). This unit did produce a broken in-process fluted Clovis preform of quartzite, but the real identification was in the materials of the tools. The hearth and surrounding use area, with chert flakes, was no more than 50 square feet, and was near the present day ridge centerline. A drawing of a majority of the Clovis and Middle Paleoindian artifacts know from Cactus Hill is shown as Figure 5.68, which is indexed with Table 5.48

The Middle Paleoindian fluted points (Type 35), were represented by 5 examples, four of which were recovered in area B on the ridge. The fifth example was found in area A around 1987. Two deep concave base points were recovered as isolated (?) finds in use areas 1 and 6 on the ridge centerline. These points are thin (5.5 and 6.5 mm), and were made from lithics not known to be available in the Nottoway River drainage. Excavation unit 2/7, near use area 6 in unit 0/5, produced Clovis-like tools and may be related to the fluted point found in 0/5. If the two units are related, the overall use area could be approximately 50 to 100 square feet, and about the same size as use area 7 of the units 2/9-2/11.

The only completely excavated Paleoindian use area examined by NRS at Cactus Hill was area 7 in units 2/9-2/11 and extending for a small distance into units 4/9 and 2/7. Latter Archaic use of the site had partly destroyed the Paleoindian working surface, but a significant amount remained. Remnants of working surfaces 25 to 50 square feet in size produced two Middle Paleoindian (?) fluted points, worked flakes, gravers, a wedge, end scraper, and an awl. Again, many of the items were of lithic materials foreign to the Nottoway drainage. The two fluted points were 5.5 mm in thickness, and one is of the deep concave base type with long flute scars while the other was made upon a flake and is a small "fishtailed" or waisted form. It is possible that use areas 5, 6, and 7 were interconnected or re-used by the same group; if related, this would have represented a combined use area of 200 to 300 square feet.

Use areas 9 and 10 were composed of six Clovis-like side scrapers of the same type of oolitic quartzite, and two closely related Clovis-like end

scrapers, respectively. No fluted points were recovered in these areas, but the tools may have been associated with the Clovis point (Type 36) in use area 11, the Clovis period hearth in use area 8, and Clovis use area 3. All of these finds are near the present day ridge centerline. In fact, almost all of the fluted point tradition artifacts were found on, or very near, the present day ridge centerline except for those in use area 7 which were centered 15 feet to the north and apparently on a terrace.

Site Use Intensity in Area B

Figure 5.69 shows the weight (normalized up or down to 100 square feet) of lithics from all of the excavation units on the ridge in area B on the Cactus Hill Site. These fairly high weight values represent the quartzite quarry nature of this site. In most cases, at least 40 to 60% of the weight of culturally associated lithics was quarry related debitage. Most of the remaining weight was fire cracked hearth stones (FCR). The central ridge was composed of two fairly wide plateau regions, an upper east region and a lower (to the river) west region. These can be seen in Figure 5.2C. Lithic concentrations were highest on the centerline on these plateaus, and were lower on the slopes to the north, west, and south. The areas of maximum use (intensity) produced total lithic weights approaching 300 lbs. per 100 square feet. In some of these areas 30 to 40 diagnostic projectile points were recovered in no more than 100 square feet.

The weight of lithics per 100 square feet in area B of the site was at maximum 3 times the weight per 100 square feet noted in area D. The intensity decreased fairly rapidly in area B as the ridge sloped to the north, with in one instance a value of 271 lbs. noted on the ridge centerline, decreasing to a value of only 31 lbs. 40 feet to the north. In contrast, the values noted over a fairly wide zone in area D remained constant at around 100 lbs. per 100 square feet.

Table 5.47. HARDAWAY SIDE-NOTCHED ARTIFACTS RECOVERED FROM EXCAVATIONS ON CACTUS HILL AREAS A AND B

Fig. 5.62 Location / Fig. 5.63 Number	Artifact Description	Lithic Material	Dimensions (mm) [1]						Weight (gm)	Comments [2]
			L	W	T	F1	F2	B. Con.		
2a/1	Hardaway Side-Notched point	Layered chert?	36	27.5	4	Thinning	Thinning	2.5	3.44	Second point, Fig. 5.63
1a/1	Hardaway Side-Notched point	Green silicified rhyolite	20	20 br.	4.5	Thinning	Thinning	2.0	1.84	Third point, Fig. 5.63
2a/2	Triangular bifacial knife or point	Blue-gray rhyolite	36	26	5.5	Thinning	Thinning	2.0	4.93	
--/4	Large end scraper	Striped black and white rhyolite	54	33	18	--	--	--	33.33	
--/3	End scraper	Gray rhyolite	34	26	11	--	--	--	11.25	Second scraper Fig. 5.63
1a/3	End scraper	Blue-gray rhyolite	24 br.	31	9	--	--	--	7.8	Third scraper Fig. 5.63
--/3	End scraper	Highly silicified green slate or tuff	29	28	9	--	--	--	7.35	Fourth scraper Fig. 5.63

Notes: [1] L=length; W=width; T=thickness; F1=flute length, side 1; F2=flute length, side 2; B. Con.=basal concavity; mm=millimeters, br=broken

[2] Indexed to general artifact locations, Figure 5.63. Not all Figure 5.63 artifacts tabulated as not all were excavated. All references to Figure 5.63 are from left.

Table 5.48. CLOVIS ARTIFACTS FROM CACTUS HILL

Fig. 5.66 Location (Use area) / Fig. 5.68 Number	Artifact Description	Lithic Material	Dimensions (mm) [1]						Weight (grams)	Comments
			L	W	T	F1	F2	B. Con.		
11/1	Clovis point	White quartz	61	26	10	25	23	3	16.48	Classic Clovis; large for white quartz
3/2	Clovis point tip (?)	Metavolcanic, green	55 bk	30 bk	9 bk	0 bk	0 bk	0 bk	16.11 bk	Tip, found with item 3; large Clovis point?
3/3	Clovis point	Chert, Mitchell, yellow-cream	40	23	7	15	10	1.5	5.95	Similar color & texture as #28, but not fibrous chert, resharpened classic Clovis
7/4	Fluted point Middle Paleoindian (?)	Highly silicified rhyolite, black (chert-like)	53	23 bk	5.5	26	24	4.5	7.07 bk	Used as twist drill-beveled; shattered into 4 fragments
7/5	Fluted point, Middle Paleoindian (?)	Crystal quartz	40	18	5.5	16	13	2.5	4.34	Discard stage; edge damaged, "fishtailed form"

Table 5.48. CLOVIS ARTIFACTS FROM CACTUS HILL

Fig. 5.66 Location (Use area) / Fig. 5.68 Number	Artifact Description	Lithic Material	Dimensions (mm) [1]						Weight (grams)	Comments
			L	W	T	F1	F2	B. Con.		
6/6	Fluted point, Middle Paleoindian	Jasper (weathered), tan	34	22	5.5	12	10	4	3.53	Similar to #25; discard stage; may have been used as drill
--/7	Clovis point	Chert, Williamson, bluish gray	62	32	9	28	24	2	18	All data from Johnson and Pearsall, 1995; classic Clovis-area A [2]
--/8	Fluted point, Middle Paleoindian (?)	Oolitic quartzite, brown	36	22	7	21.5	17	4.5 bk	4.9	All data from Johnson and Pearsall, 1995; area A [2]
1/9	Fluted point, Middle Paleoindian	Silicified rhyolite or tuff, black	61	24	6.5	23	11	5-6 bk	--	Ear worked into graver; deep concave base
7-8/10	Channel flake, from fluted point	Highly silicified slate, green (chert-like)	33	15	2	--	--	--	1.63	used as knife
10/11	End scraper	Chert, Mitchell, yellow	37	28	6	--	--	--	5.83	Similar color & texture to #28, but not fibrous chert, similar to #3
5/12	End scraper	Metavolcanic, green with spots	31	25	8.5	--	--	--	7.12	similar to #24
7/13	End scraper/ Graver	Chert, Mitchell, yellow				--	--	--	6.67	Similar to #28 & #37, but less fibrous; also similar to #3 & #11
7/14	End scraper	Chert, fossiliferous gray	21	18	8	--	--	--	2.80	Found with item #4
9,10,11/15	End scraper	Oolitc quartzite, white	15 bk	25	8	--	--	--	4.0 bk	Found near other items of oolitic quartzite
10/16	End scraper	Jasper, gray, green, black	35	21	9.5	--	--	--	7.82	same as #26
9,10,11/17	End scraper	Oolitic quartzite, white	36	18	11	--	--	--	6.35	Found near other items of oolitic quartzite
7/18	Graver	Jasper, brown-yellow	38	28	12	--	--	--	6.74	Same as #38-thick flake
7/19	Graver	Chalcedony, Mitchell, white	33	23	3.5	--	--	--	2.91	thin flake
8/20	Graver/ Flake knife	Chert (Williamson?) black and blue	37	30	8	--	--	--	7.55	With hearth 10,920± 250 B.P.
7/21	Awl or Graver	Chert (heated), pink	60	14	11	--	--	--	6.59	Little modification to flake; unusual item, may be of Palmer age?
7/22	Flake knife, edge worked	Chert, fibrous yellow	55	29	9	--	--	--	9.85	Similar to item #28
3/23	Flake knife, edge worked	Chert, fossiliferous gray	47	30	8.5	--	--	--	10.5	Found with item #3

Table 5.48. CLOVIS ARTIFACTS FROM CACTUS HILL

Fig. 5.66 Location (Use area) / Fig. 5.68 Number	Artifact Description	Lithic Material	Dimensions (mm) [1]						Weight (grams)	Comments
			L	W	T	F1	F2	B. Con.		
--/24	Flake knife, edge worked	Metavolcanic, spotted, green-white	50	37	9	--	--	--	15.55	Reported from area A
11/25	Flake knife, edge worked	Jasper (weathered) tan	60	26	4.5	--	--	--	7.40	Same as #6
3/26	Flake knife, edge worked	Jasper, green-gray-black	51	29	5	--	--	--	8.6	Faceted blade; found with item #3; same as #16
--/27	Flake knife, edge worked	Chert, Williamson, white	45	38	9.5	--	--	--	13.85	Blade-like flake; reported from area A
8/28	Side scraper	Chert, fibrous yellow	45	32	8	--	--	--	11.20	Faceted blade; with hearth 10,920±250 B.P.
8/29	Side scraper	Chert, Williamson, brown-cream-blue	84	37	12	--	--	--	33.49	With hearth 10,920±250 B.P.
4/30	Graver	Chert, fossiliferous gray	30	29	6.5	--	--	--	5.46	Similar to items 14 & 23
7/31	Graver	Chalcedony, weathering amber	34	29	5	--	--	--	3.45	thin flake
7/32	Graver, or awl	Jasper (burned), purple	30	18	7	--	--	--	3.78	May be burned material same as items 6 & 25
9/33	Side scraper	Oolitic quartzite, brown	56	24	16	--	--	--	20.60	Similar to item #8 identical to items 34, 35, 36
9/34	Side scraper	Oolitic quartzite, brown	48	35	16	--	--	--	25.73	Similar to item #8 identical to items 33, 35, 36
9/35	Side scraper	Oolitic quartzite, brown	46	23	14	--	--	--	15.00	Similar to item #8 identical to items 33, 34, 36
9/36	Side scraper	Oolitic quartzite, brown	53	27	17	--	--	--	22.85	Similar to #8 identical to item 33, 34, 35
7/37	Side scraper	Chert, fibrous yellow	43	29	11	--	--	--	9.87	Similar to item #28 & 22
7/38	Edge used flake	Jasper, brown-yellow	38	19	10	--	--	--	5.05	Same as #18
7/39	Wedge	Quartzite, brown	43	39	12	--	--	--	24.58	This is the single "Clovis" artifact of common quartzite
--/40	Wedge	Chert, blue-white Williamson,	45	23	13	--	--	--	13.11	Reported from area A

Notes: [1] L=length; W=width; T=thickness; F1=flute length, side 1; F2=flute length, side 2; B=basal concavity; mm=millimeters

[2] Data from ASV Fluted Point Survey, Quarterly Bulletin of the Archeological Society of Virginia, March 1995, 50 (1).

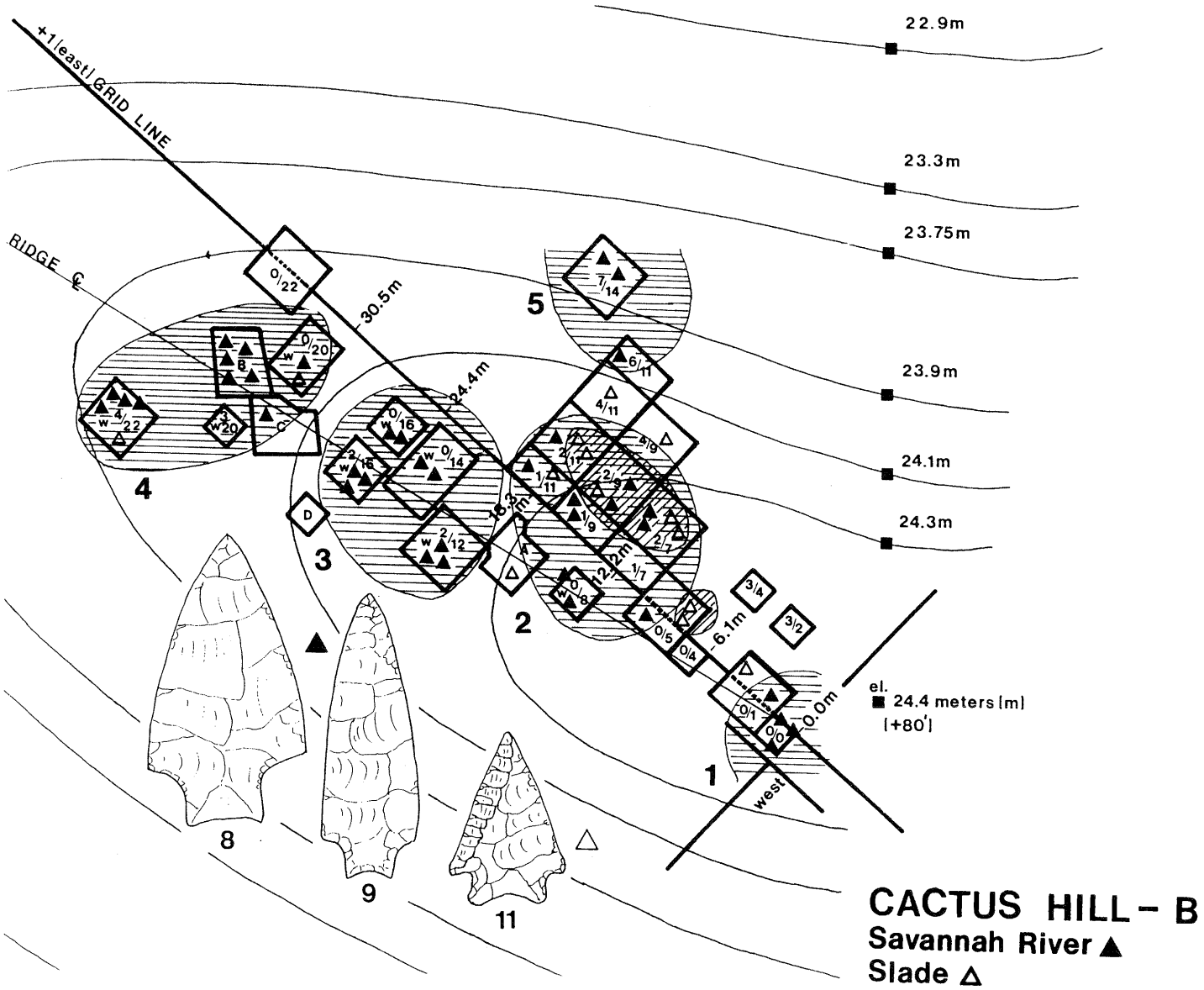


Figure 5.48. Cactus Hill area B excavation, Savannah River and Slade traditions use areas. Savannah River includes narrow and wide blade types.

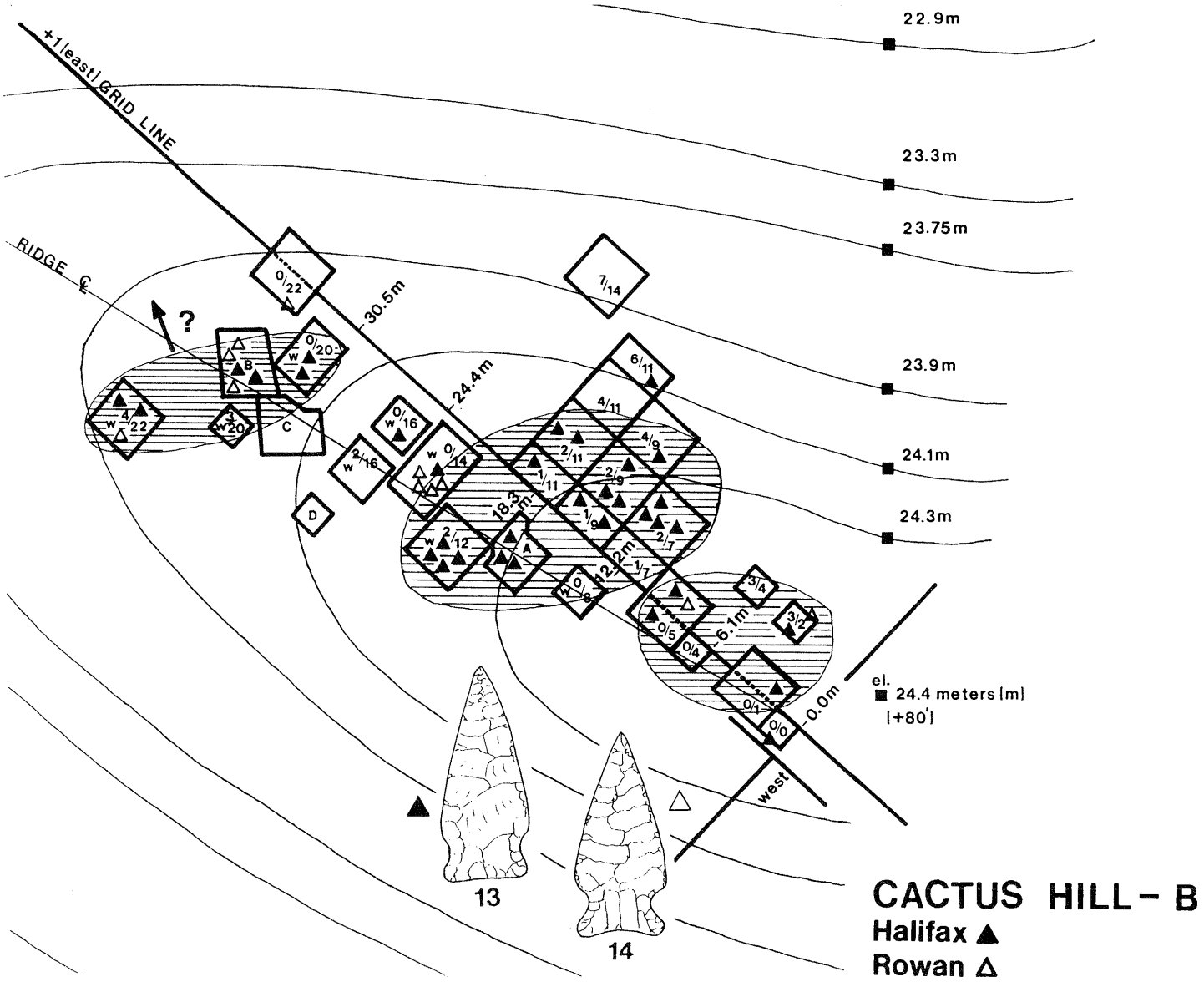


Figure 5.49. Cactus Hill area B excavations, Halifax and Rowan traditions use areas.

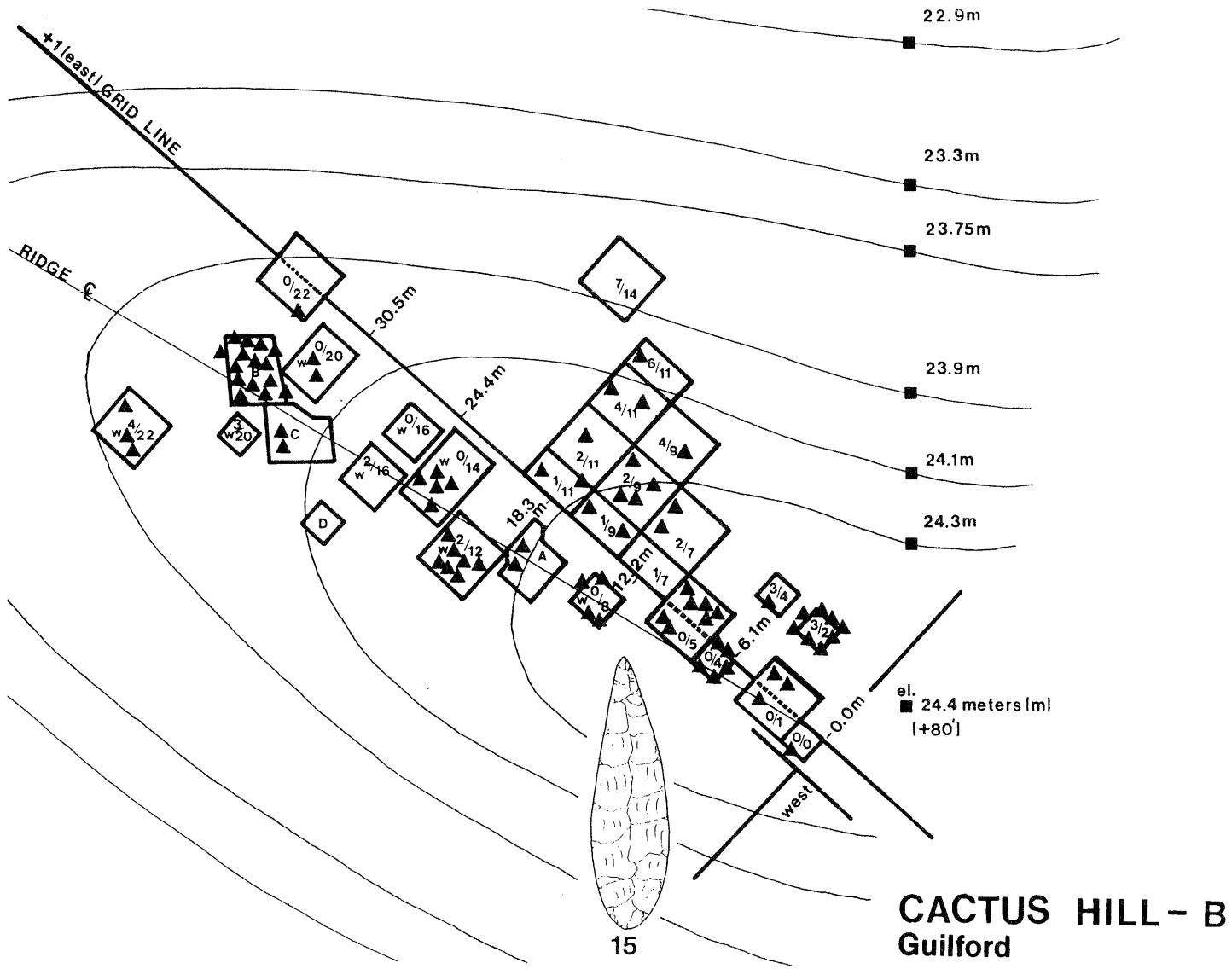


Figure 5.50. Cactus Hill area B excavations, Guilford tradition use areas.

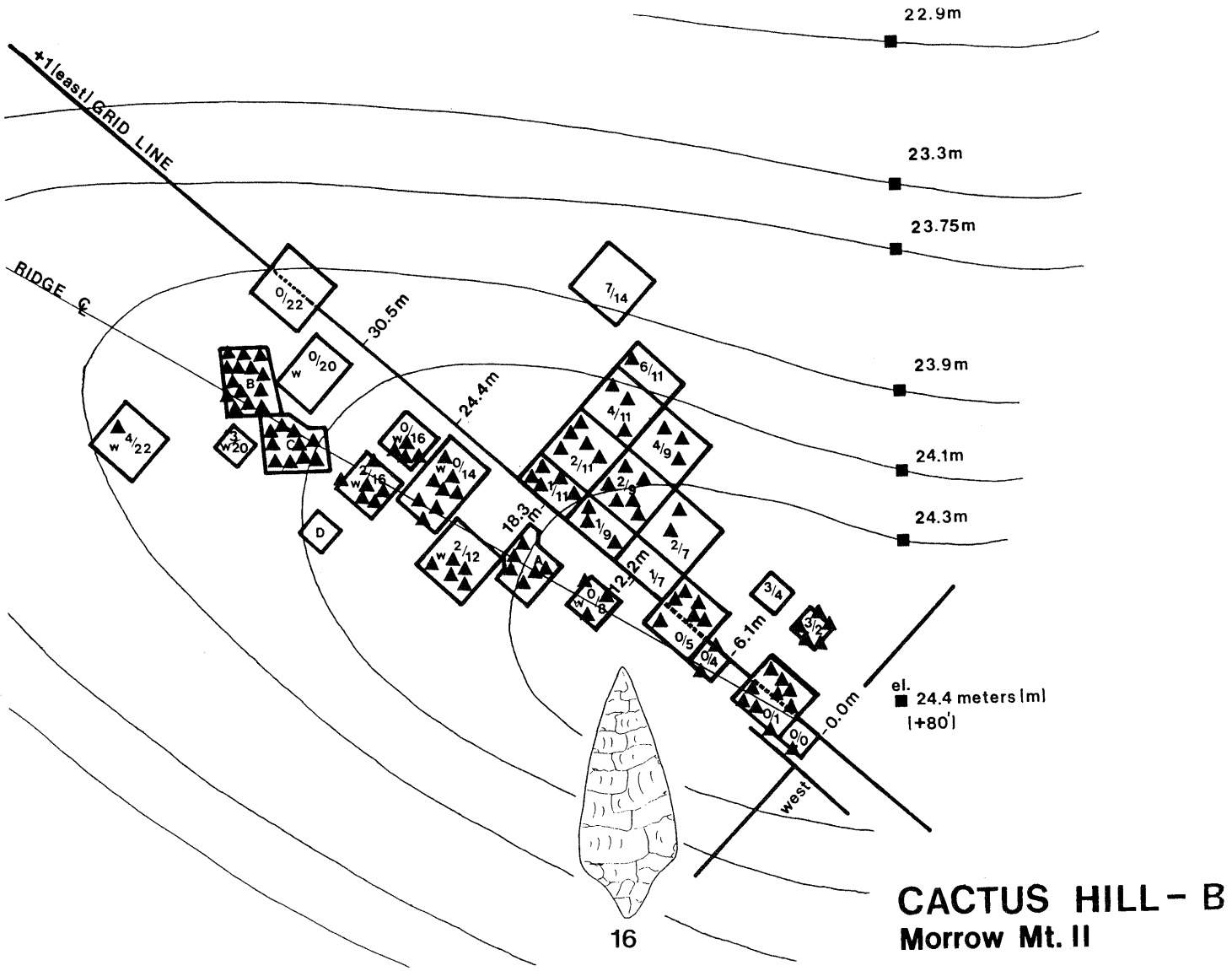


Figure 5.51. Cactus Hill area B excavations, Morrow Mountain II tradition use areas.

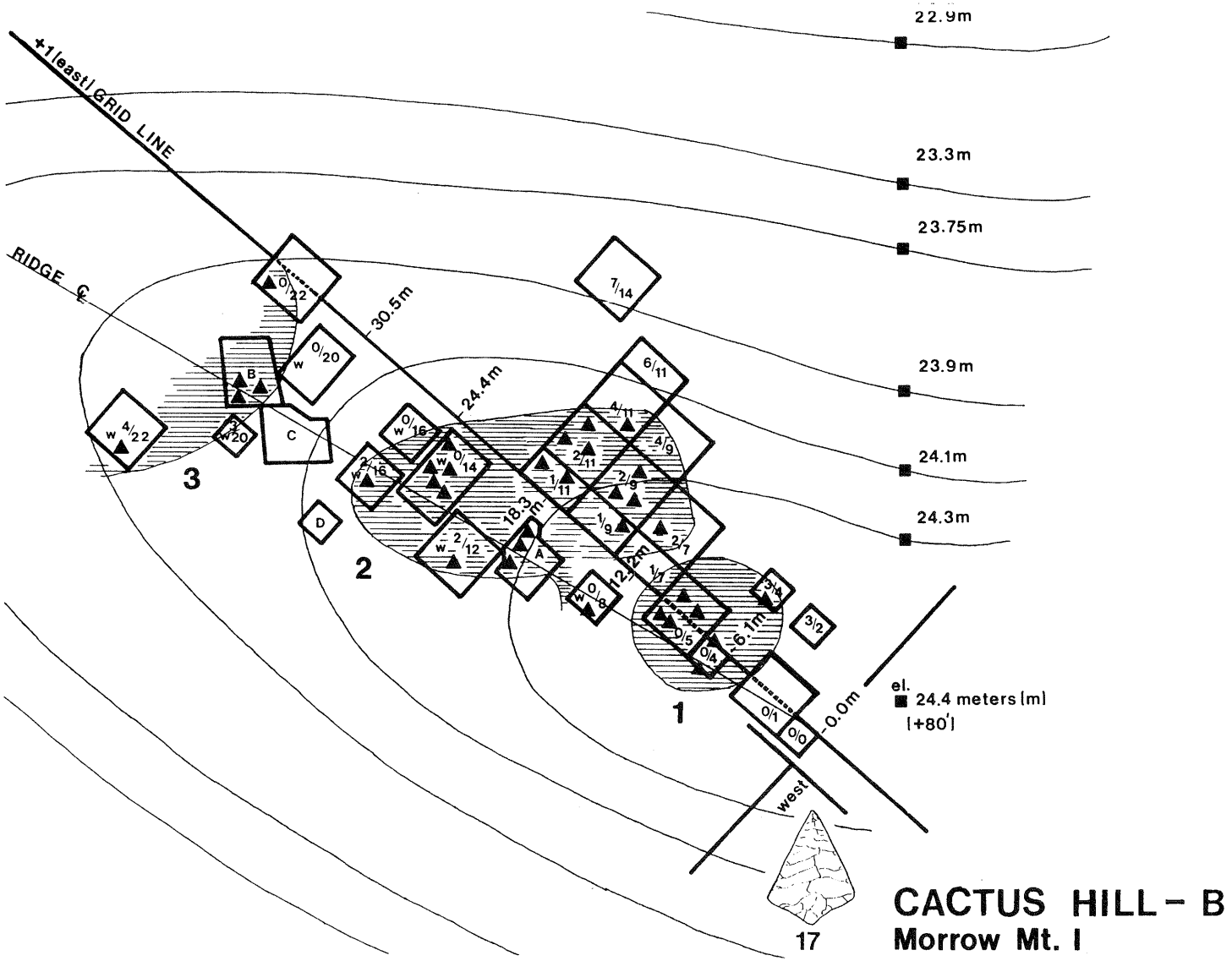


Figure 5.52. Cactus Hill area B excavations, Morrow Mountain I tradition use areas 1, 2, and 3.

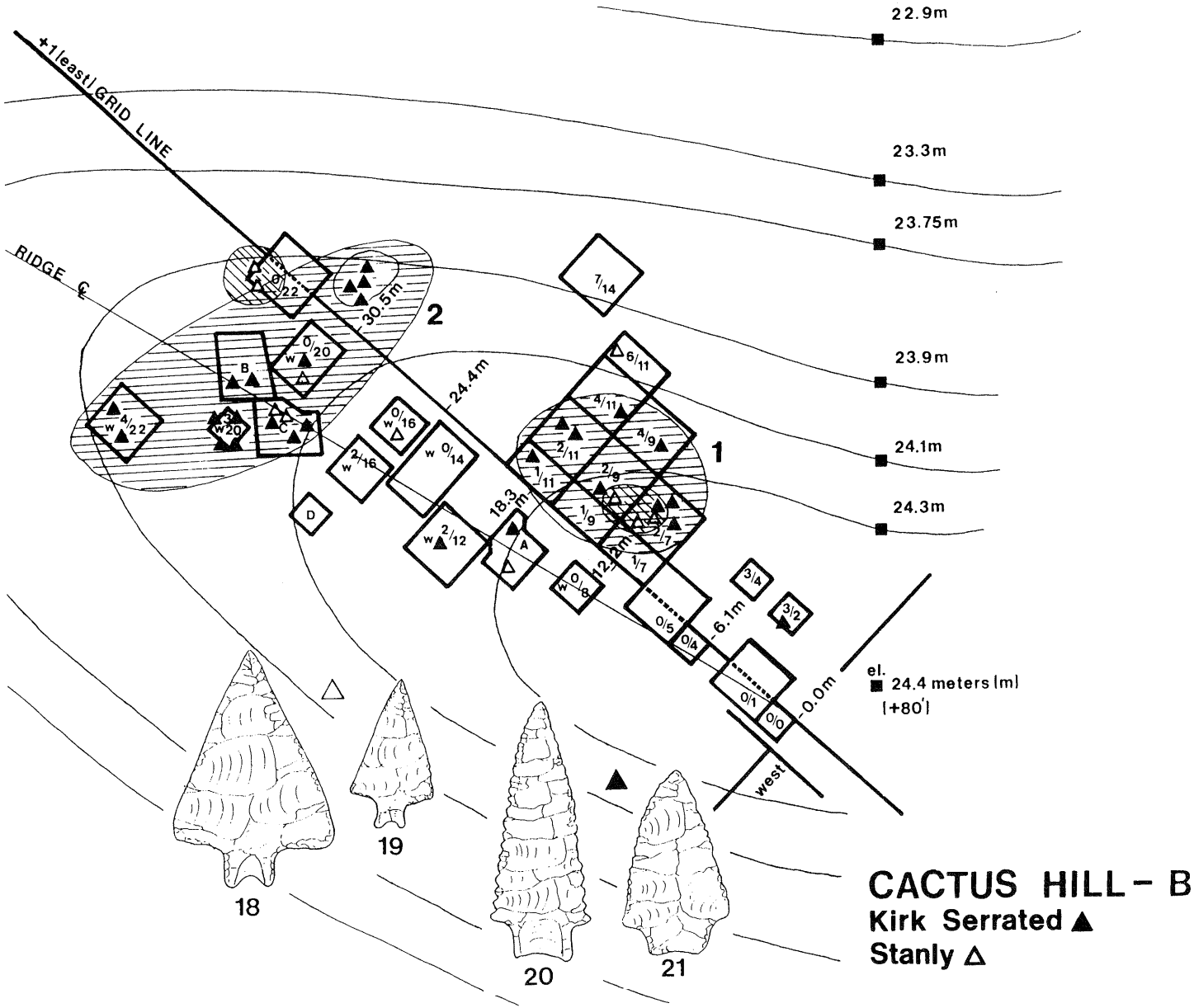


Figure 5.53. Cactus Hill area B excavations, Kirk Serrated and Stanly tradition use areas 1 and 2.

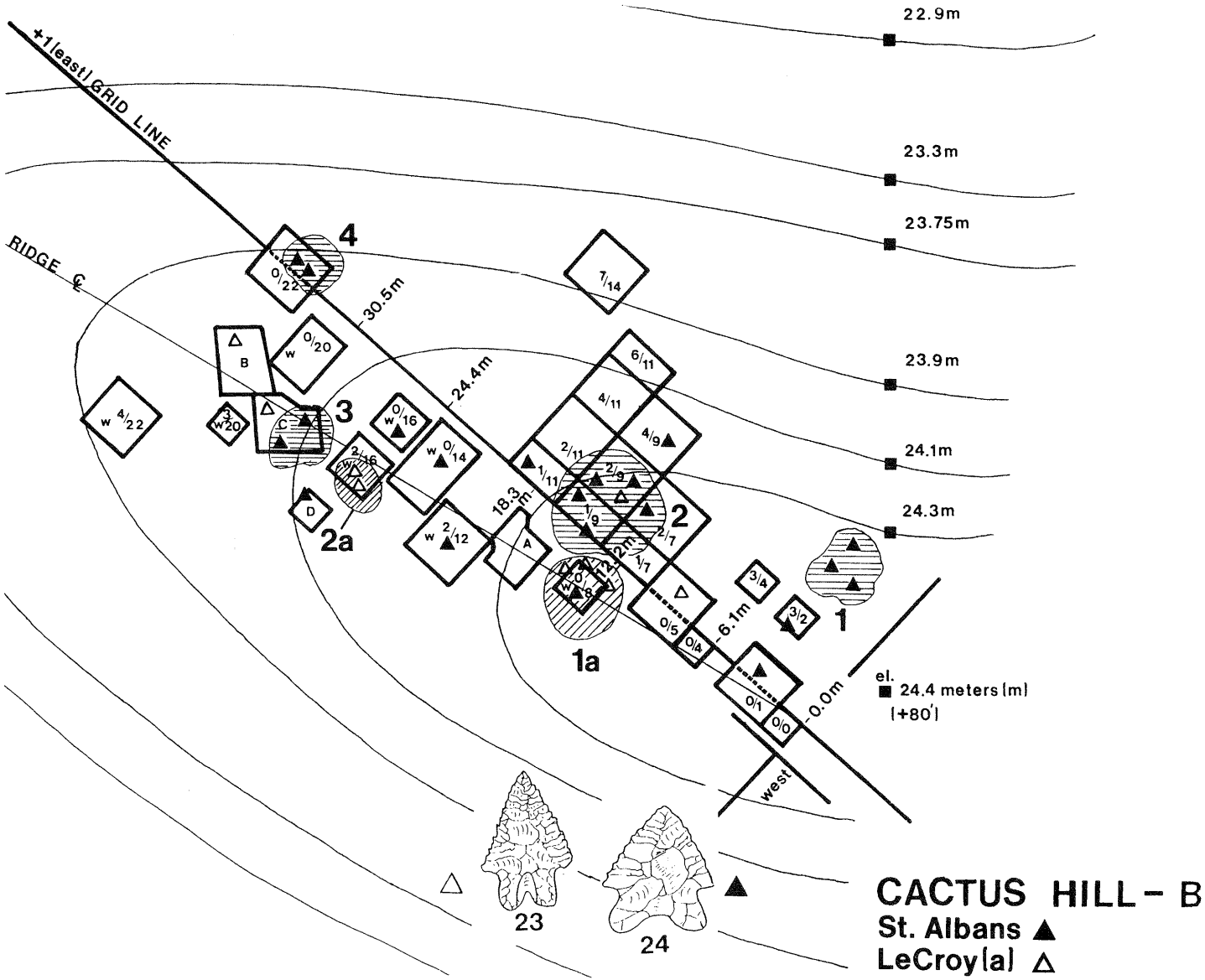


Figure 5.54. Cactus Hill area B excavations, St. Albans tradition use areas 1, 2, 3, and 4; LeCroy tradition use areas 1a and 2a.

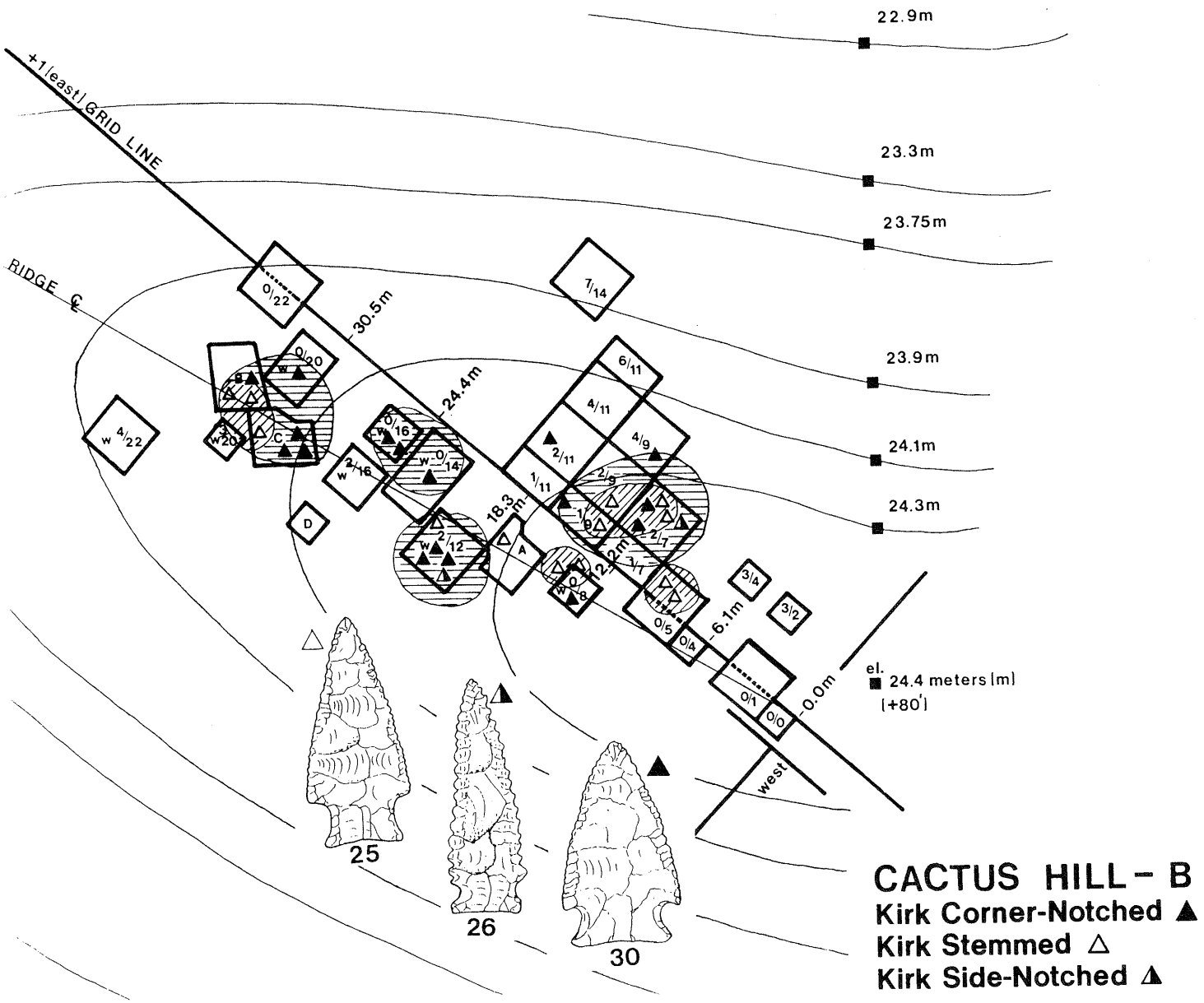


Figure 5.55. Cactus Hill area B excavations, Kirk Corner-Notched, Kirk Stemmed, and Kirk Side-Notched traditions use areas.

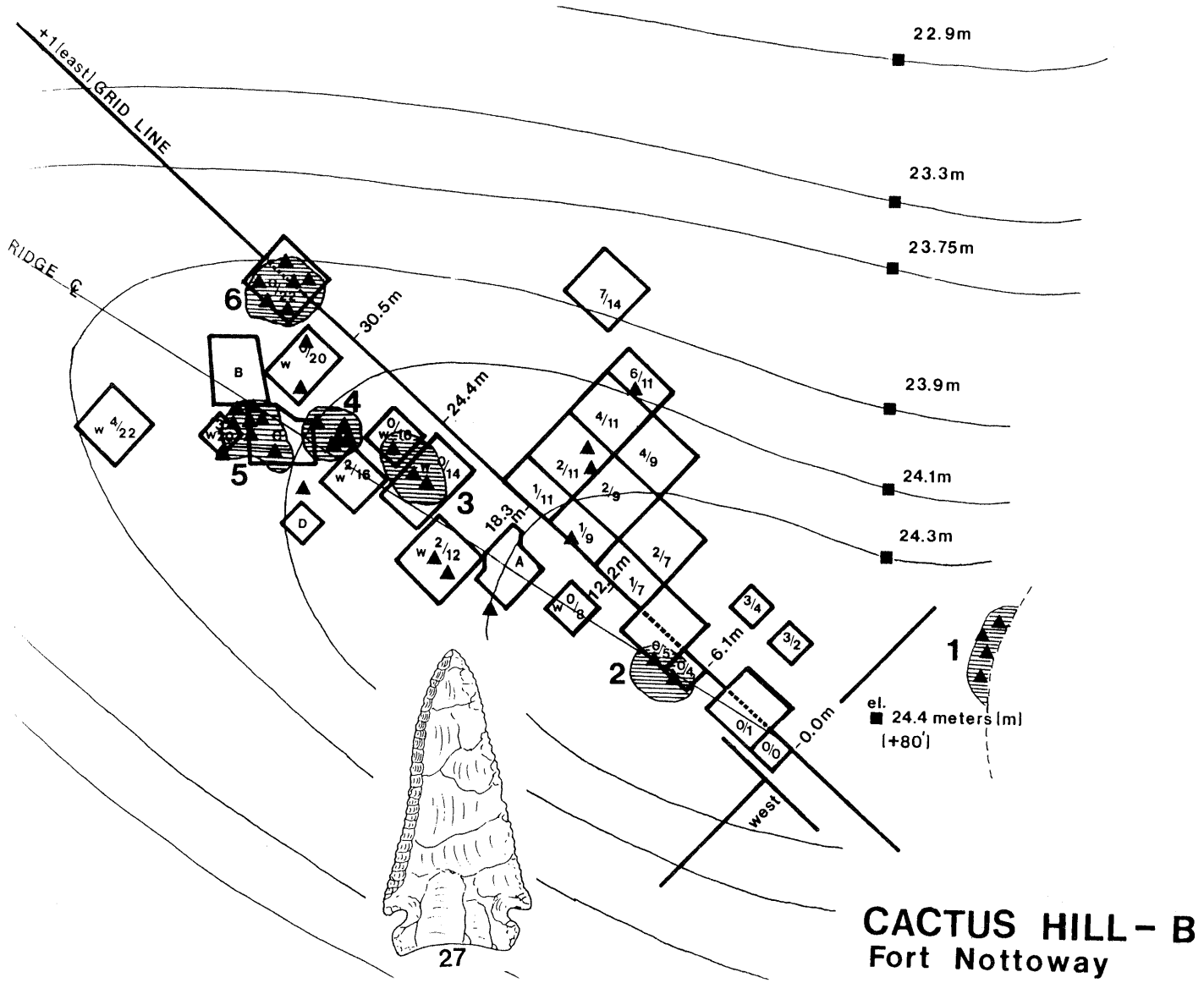


Figure 5.56. Cactus Hill area B Excavations, Fort Nottoway tradition use areas 1, 2, 3, 4, 5, and 6. Some data provided to NRS by others.

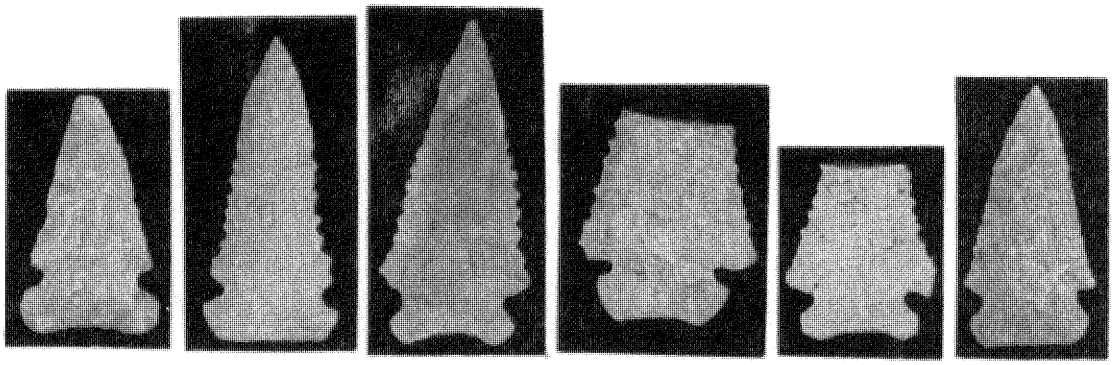


Figure 5.57. Fort Nottoway projectile points/hafted bifaces excavated upon the Cactus Hill Site, areas A, B, C, and D. All are shown 1/2 natural size.

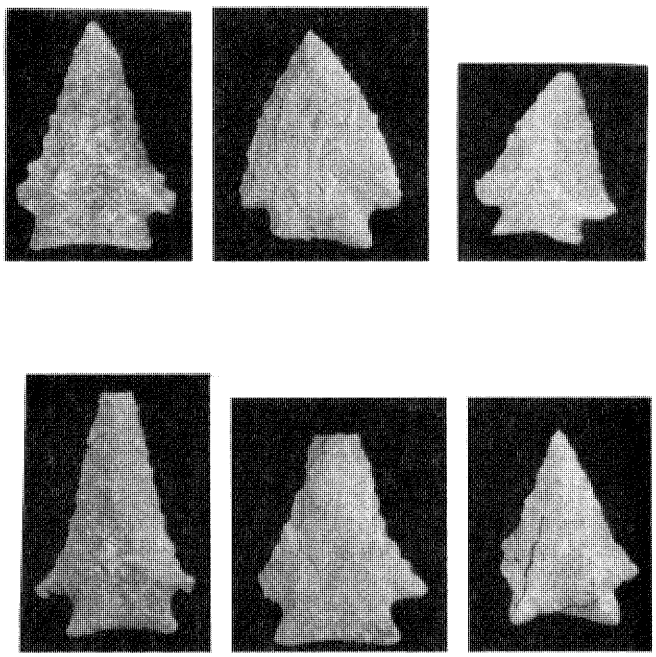


Figure 5.58. Decatur projectile points/hafted bifaces excavated upon the Cactus Hill Site, areas B and D. All are shown natural size.

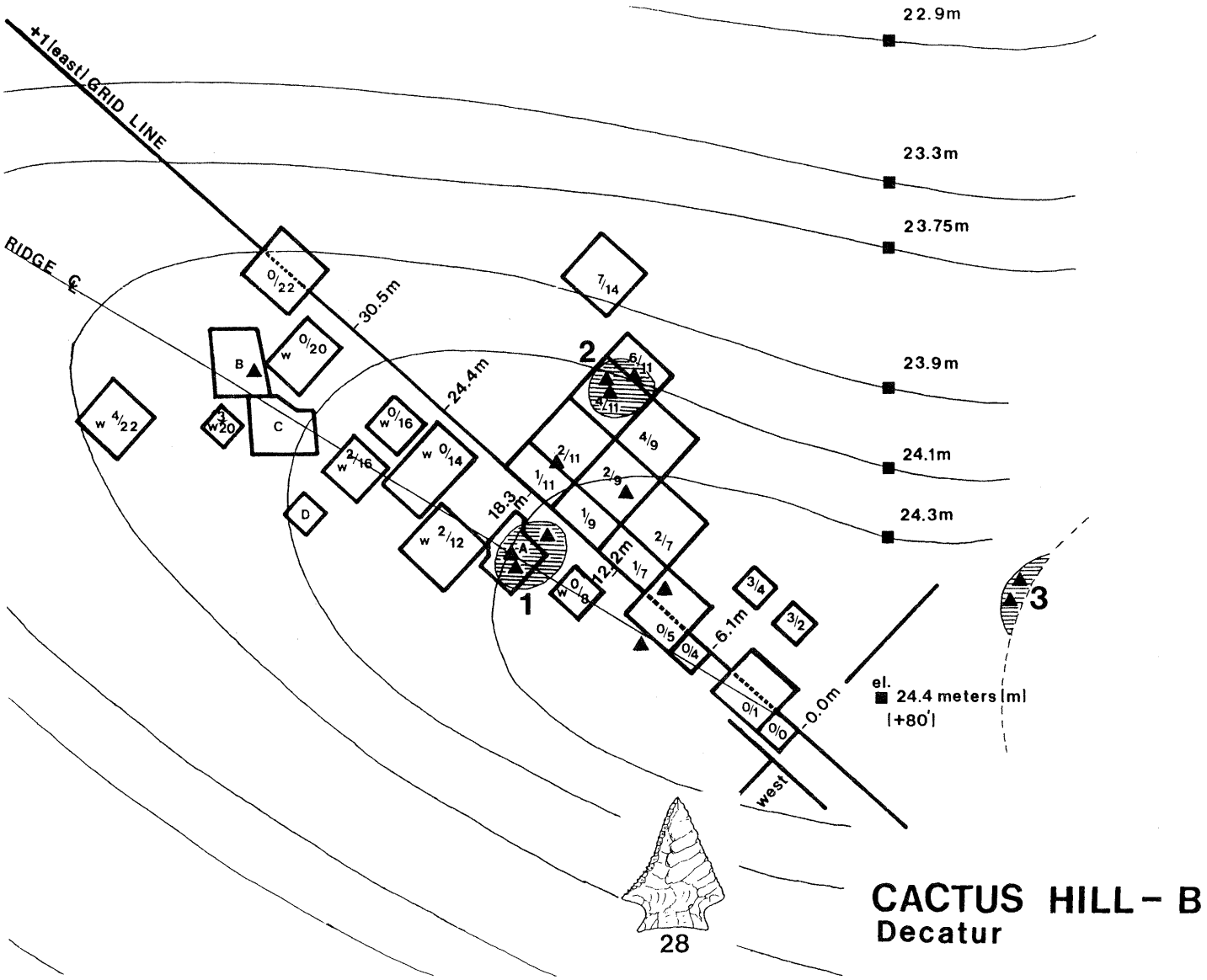


Figure 5.59. Cactus Hill area B excavations, Decatur tradition use areas 1, 2, and 3. Some data provided to NRS by others.

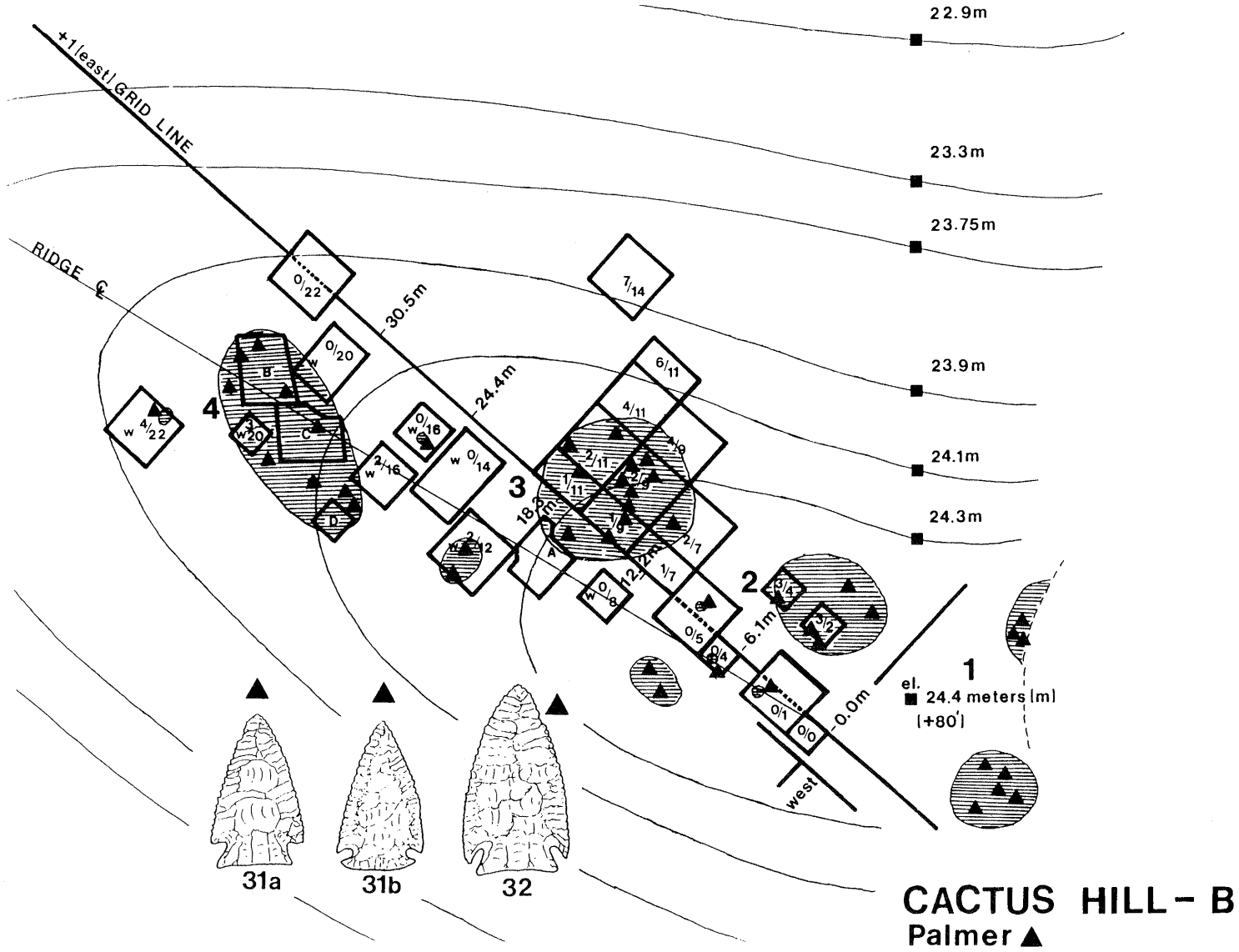


Figure 5.60. Cactus Hill area B excavations, Palmer tradition use areas 1, 2, 3, and 4. Some data provided to NRS by others.

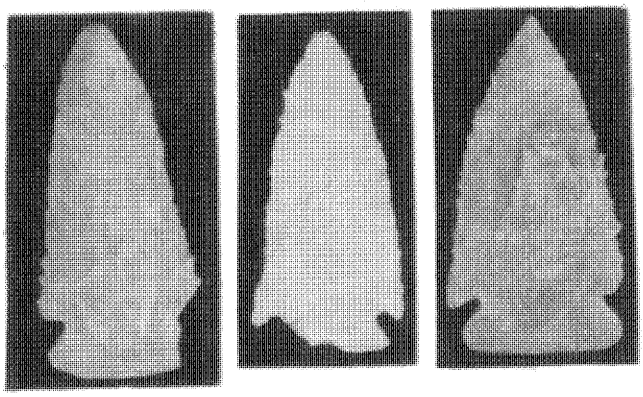


Figure 5.61a. Large deep notched Palmer points/hafted bifaces excavated upon the Cactus Hill site, areas A and D. All are made of fine grain glassy quartzite. (shown 70% natural size).

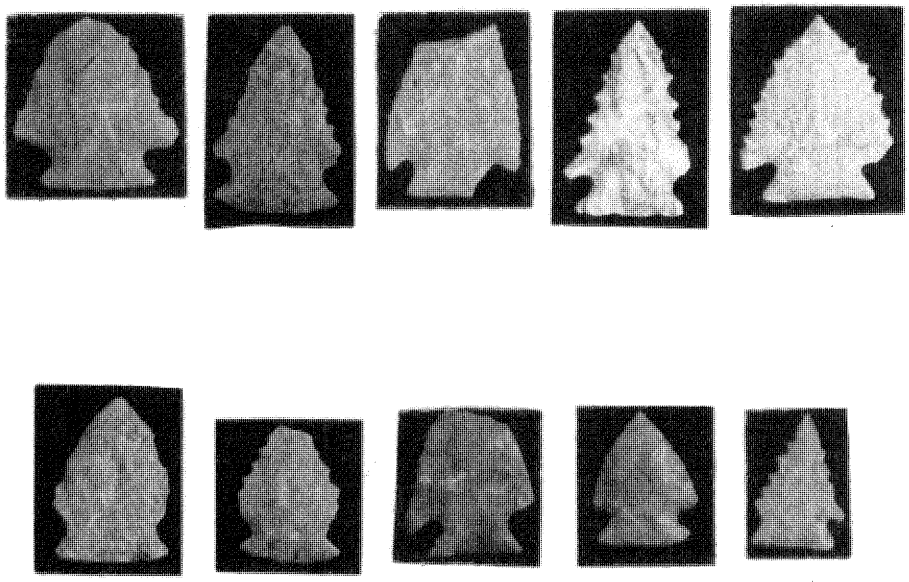


Figure 5.61b. Small Palmer points showing both flat base and convex base types excavated upon the Cactus Hill Site, areas B and D. Top row from left, 1-3, quartzite; 4, chert; 5, quartzite; bottom row, 1 and 2 quartzite; 3 and 4, jasper; 5, quartzite. (shown 70% natural size).

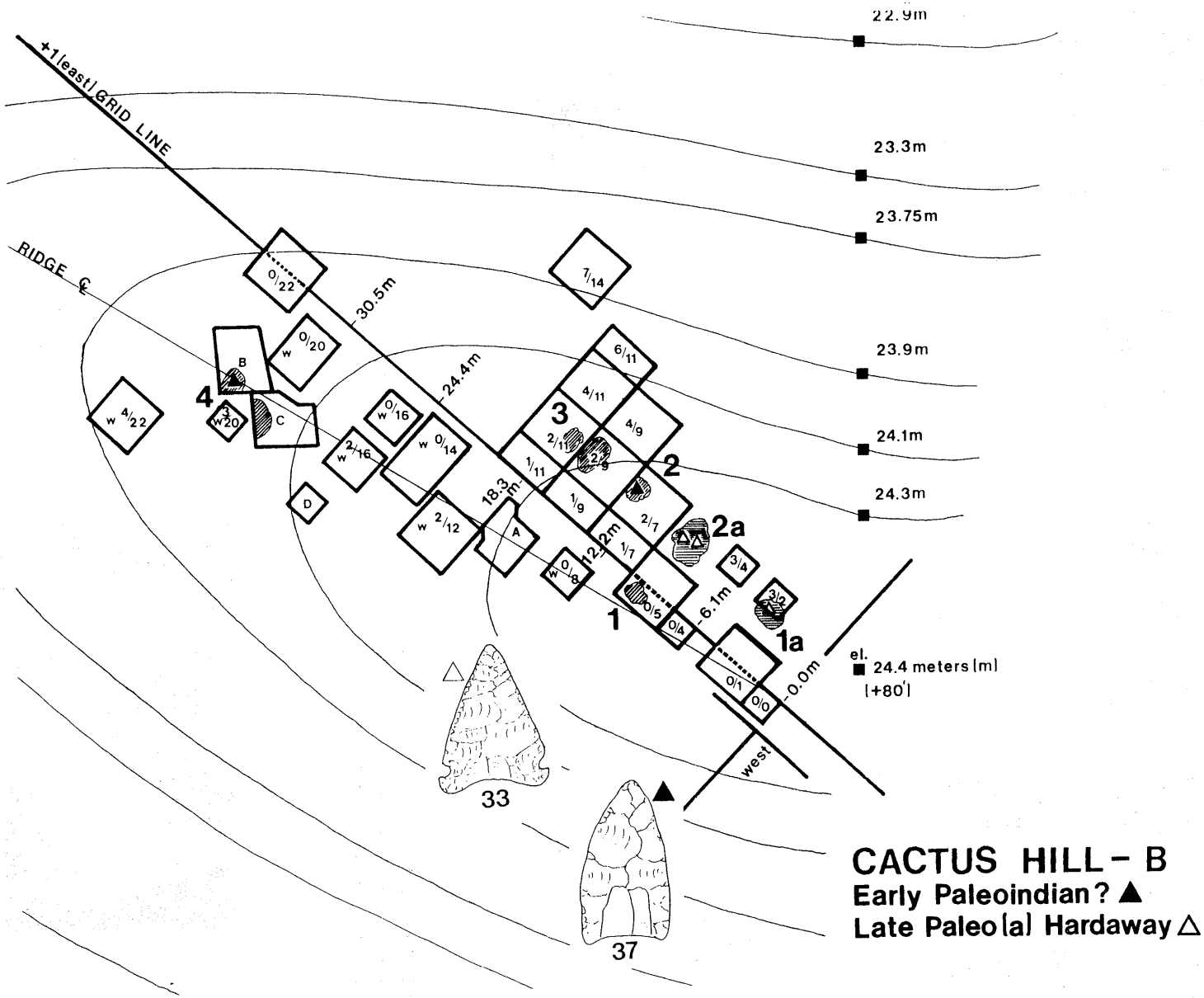


Figure 5.62. Cactus Hill area B excavations, Early Paleoindian (?) tradition use areas 1, 2, 3, and 4; and Late Paleoindian Hardaway Side-Notched use areas 1a and 2a. Some data provided to NRS by others.

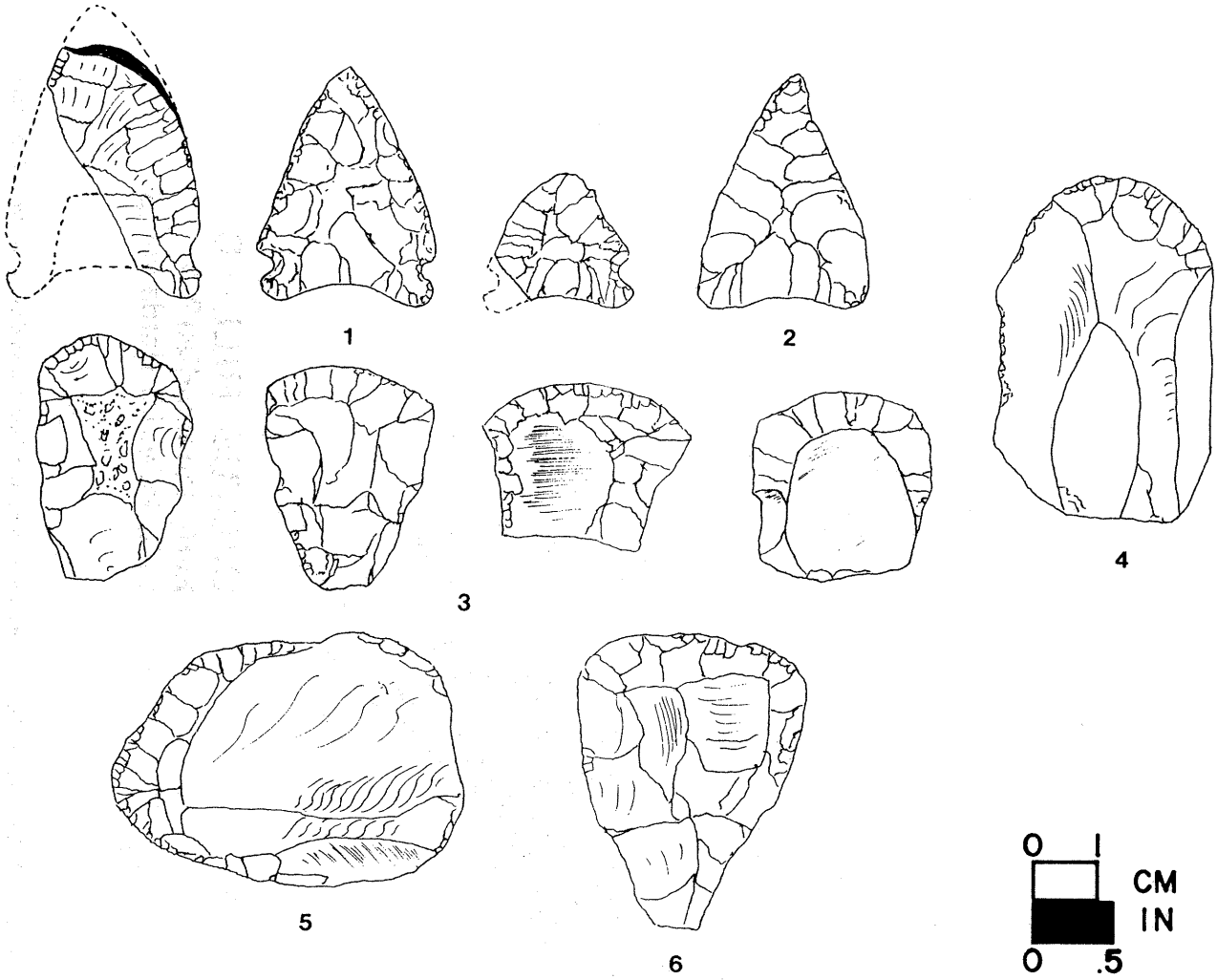


Figure 5.63. Hardaway Side-Notched tradition artifacts from excavations on Cactus Hill area B. 1, Hardaway Side-Notched points; 2, unnotched triangular biface; 3, small end scrapers; 4, large end scraper; 5, oval knife (unifacial); 6, end scraper with pointed haft element. (shown natural size).

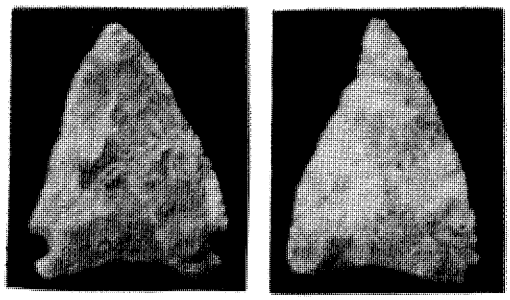


Figure 5.64. Hardaway Side-Notched point and unnotched biface shown by drawing in 5.63 above. (shown natural size).

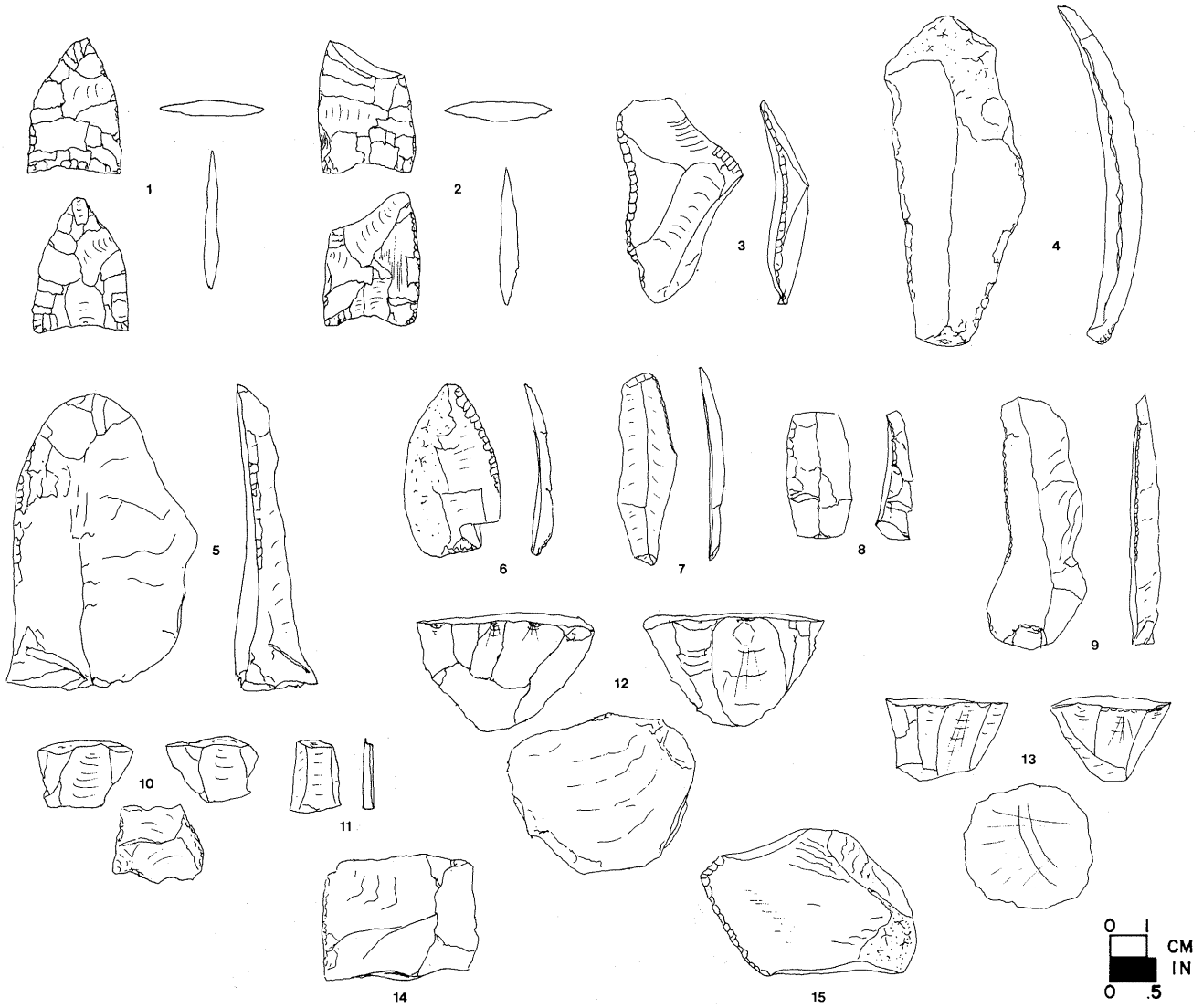


Figure 5.65. Early triangular points and blade cores/core blade tools from excavation on Cactus Hill, area B. 1 and 2 projectile points/hafted bifaces; 3, 4, 5, 6, and 8, edge worked core blades and blade-like flakes; 7, 9, 11, and 14 , edge used flakes; 10, 12, and 13, blade cores.

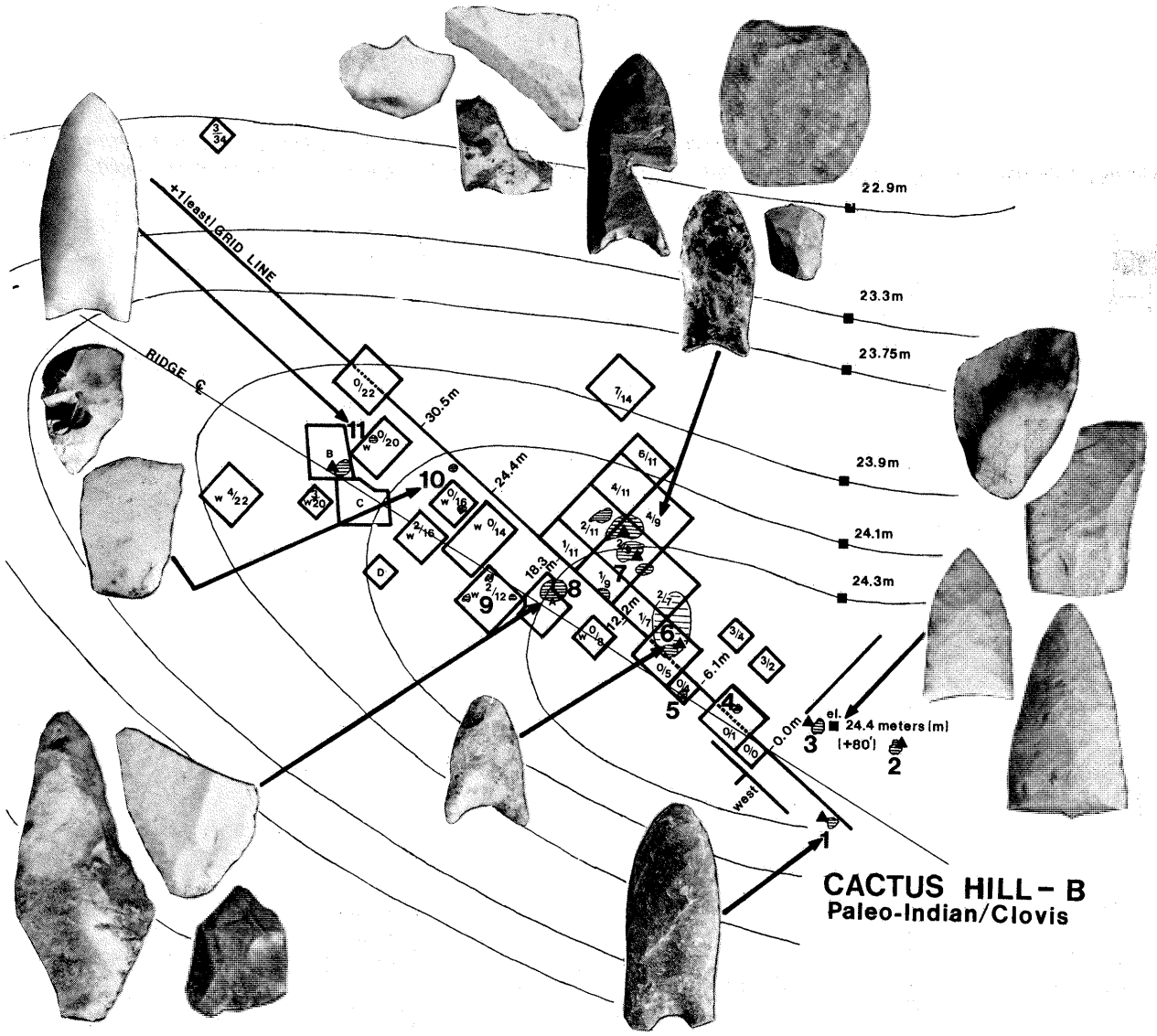


Figure 5.66. Cactus Hill area B excavations, fluted point tradition use areas, and probable use areas, 1 through 11. Reduced size photographs of some projectile points and tools are shown by use areas. Some data provided to NRS by others.

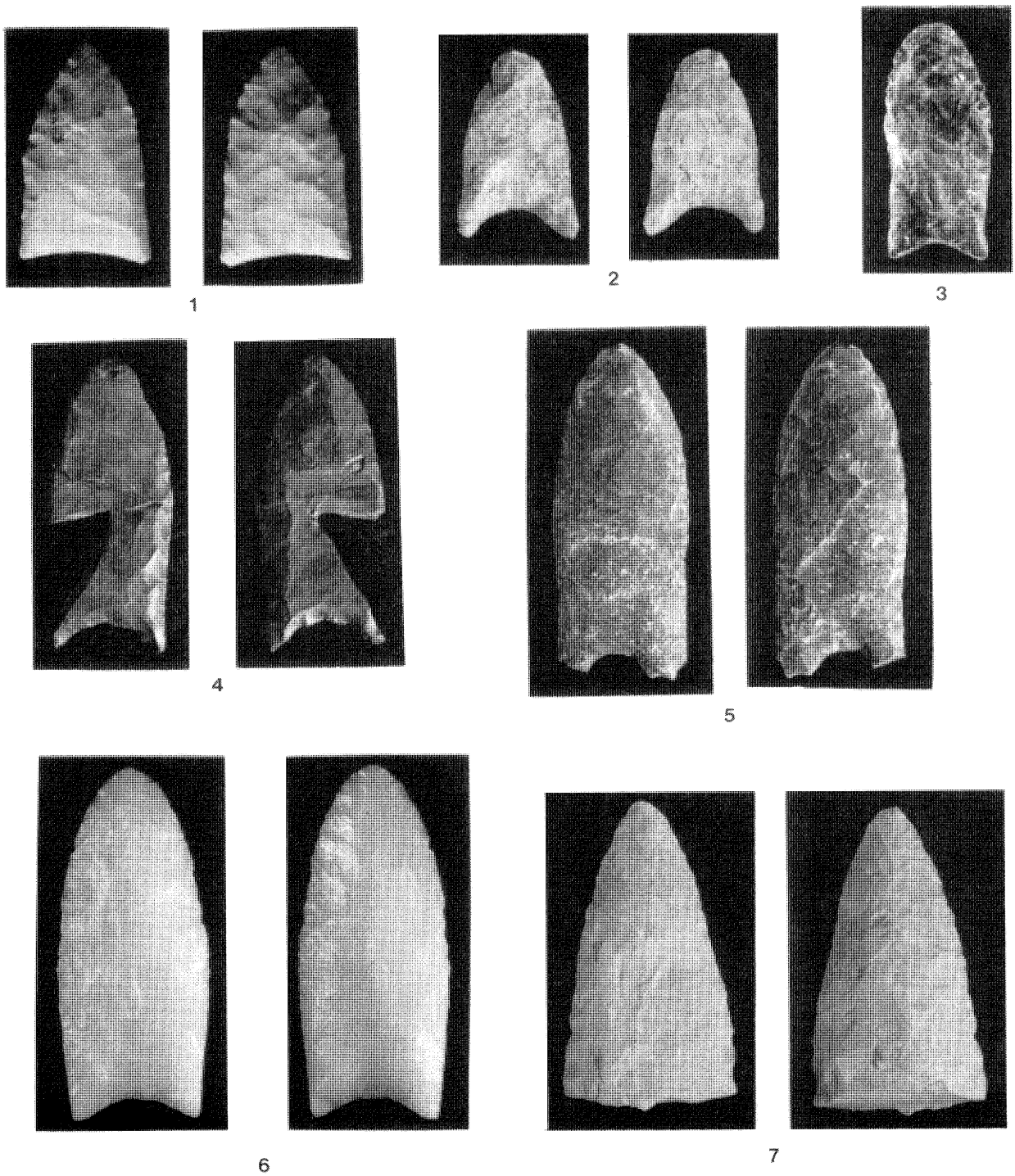


Figure 5.67. Fluted points from Cactus Hill area B. 1, Clovis - Mitchell chert, reject stage; 2, deep concave base mid Paleoindian (?) - jasper; 3, fishtailed or waisted form mid Paleoindian(?) - crystal quartz; 4, deep concave base mid Paleoindian (?) - chert-like rhyolite; 5, deep concave base mid Paleoindian (?) - silicified rhyolite or tuff; 6, Clovis - highly vitreous white quartz; 7, Clovis (?) excavated with #1 - green metavolcanic material. (shown natural size)

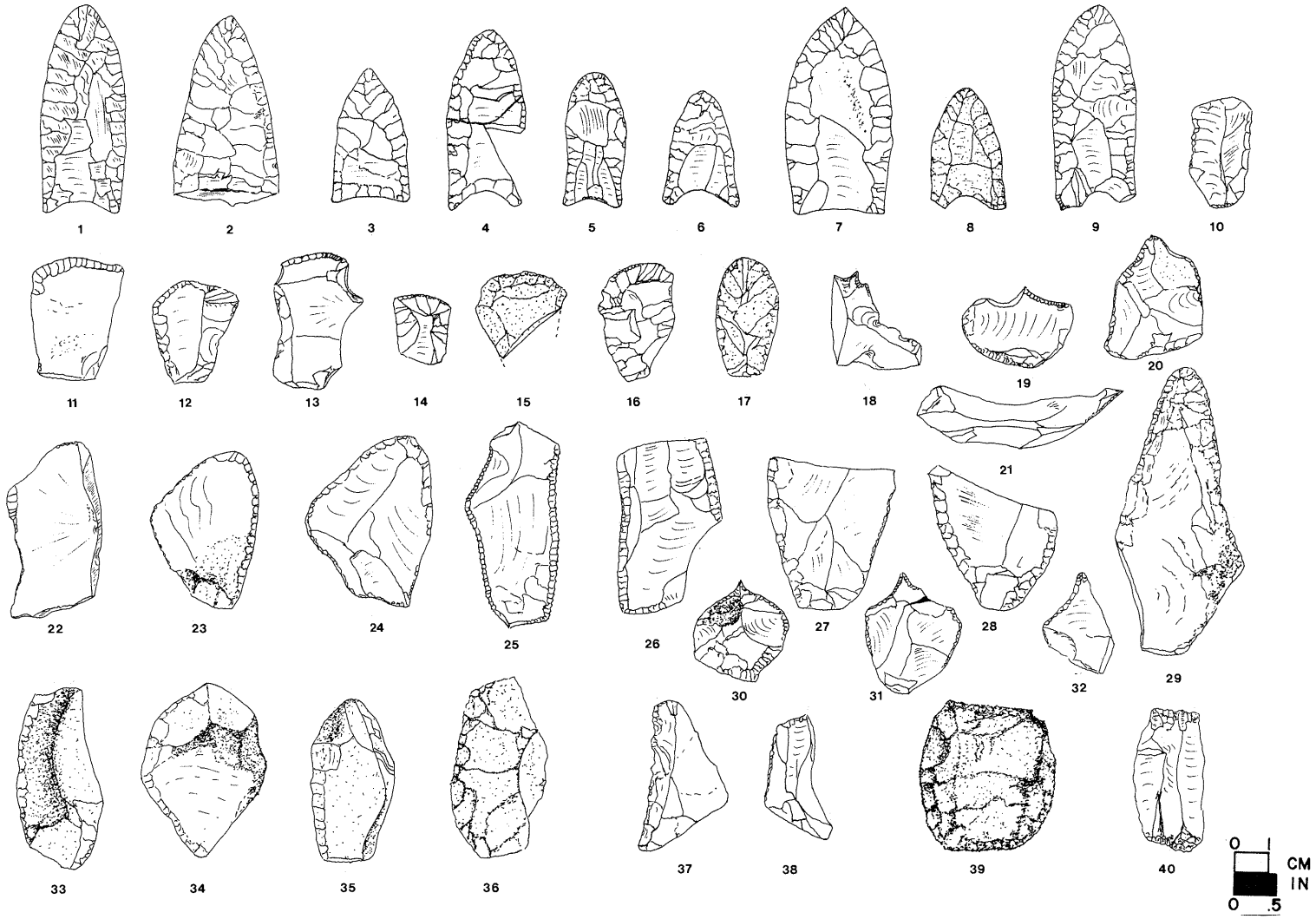


Figure 5.68. Fluted point traditions artifacts excavated on Cactus Hill, area B. 1, 2, 3, and 7, Clovis-like fluted points; 4, 6, 8, and 9, deep concave base Middle Paleoindian (?) fluted points; 5, fishtailed or constricted waist fluted point - Middle Paleoindian (?); 10, channel flake - used as a knife; 11 through 17, end scrapers; 18, 19, 20, 30, 31, gravers; 21, 32, awls; 22, 23, 24, 25, 26, 27, edged blade-like flakes; 28, 29, 33, 34, 35, 36, and 37, side scrapers; 38, edge used flake; 39 and 40, wedges. Numbers are indexed to Table 5.48.

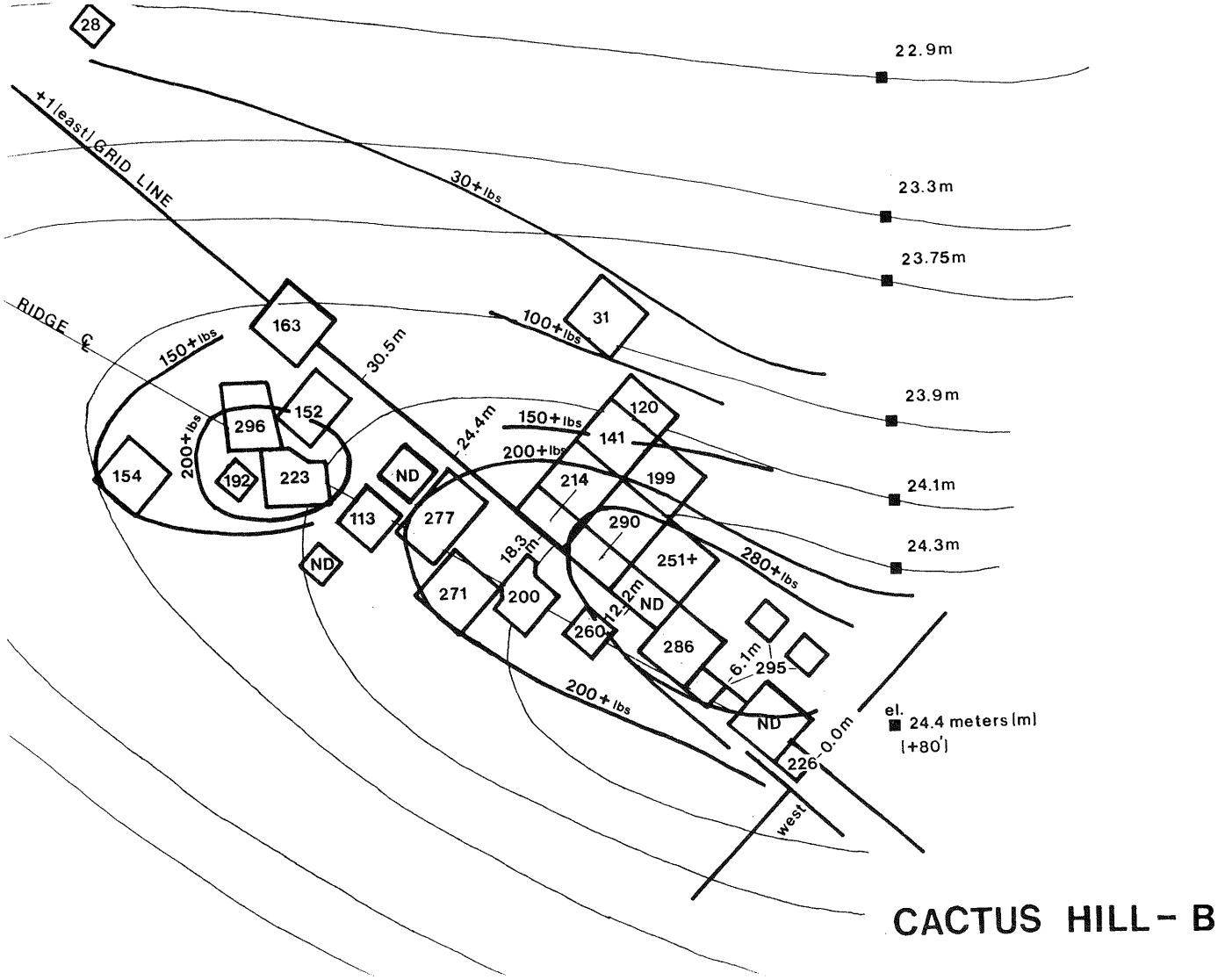


Figure 5.69. Cactus Hill area B excavations, site use intensity as reflected in weights of culturally associated lithics. Each excavation unit normalized to 100 square feet to determine weights.

Chapter 6

Results of Laboratory Analysis of Cactus Hill Data - Areas D and B

Introduction

Chapter 6 will address the results of the various laboratory investigations associated with the Cactus Hill area D and area B archaeological excavations. The area A excavation was conducted by M. F. Johnson, and this work is presented separately as Appendix G. The topics to be discussed in this chapter are:

(1) Assessment of the quality of the archaeological data base in area D and area B of the site;

(2) Analysis of floral remains;

(3) Radiocarbon date summary;

(4) Analysis of faunal remains;

(5) CIEP analysis of lithic artifacts and comparison of the results of this technique with the faunal (calcined bone) remains; and

(6) The chronological sequence of diagnostic artifacts - culture sequence.

Site geology, as presented by Johnson and Jones (Appendix C), was summarized earlier in Chapter 2.

Assessment of the Quality of the Archaeological Data Base

There are significant differences in the quality (integrity and completeness) of the archaeological data base as derived from area D and area B upon the Cactus Hill Site. Such differences are the result of soil type, deposit depth, degree of disturbance, preservation of non-lithics, completeness of the culture sequence, and method of site use.

The following site area characteristics are discussed relative to area D and area B which together define the integrity and completeness of the archaeological record on Cactus Hill:

1. Depth of stratified cultural deposits:

   Area D: 30 to 50 inches, some areas of sterile sand (strata) separating occupations;

   Area B: 20 to 36 inches, generally no areas of sterile sand (strata) separating occupations.

2. Horizontal integrity of artifacts:

   Area D: Very high degree of stability in horizontal position of artifacts.

   Area B: Less integrity in horizontal stability than observed in area D - some excavation units produced no intact clusters or features, only scatters. Other units produced partial working surfaces, primarily from the Early Archaic and Paleoindian periods.

3. Vertical integrity of artifacts:

   Area D: Very good in most excavation units. Artifact stability and fairly high sand accretion rates combine to produce interpretable artifact sequences within the microstratigraphy.

   Area B: Poor in most excavation units, with little artifact stability as a result of the heavy occupation on the center of the ridge. Artifacts of very early and very late cultural periods generally show less mixing. There was very heavy mixing in the Middle and Late Archaic period. In some locations in area B, intact geological lamellar banding in the deposit provided some indirect indication of deposit integrity.

4. Preservation and stratigraphic integrity of hearth features and pits:

   Area D: This area produced many intact

hearth features with hearthstones still tightly clustered. Some pits of Archaic age were identifiable based on a slight color change and the position of concentrations of carbonized floral material or calcined bone. Other features were heavy, intact concentrations (often pits) of flakes. Due to the shallow nature of the stratified deposits, some features such as basin hearths, pit hearths, and other pits were intrusive into working and living surfaces of earlier periods. It was determined that hearth features could be reliably associated with the levels in which they were found only where the features contained diagnostic artifacts or lithic materials directly linking them with other artifacts from the level.

Area B: This area produced fewer intact features than did area D, because of heavy use. Otherwise, the same observations made for area D apply to area B.

5. Preservation of non-lithics (floral and faunal remains)

Area D: The preservation of floral and faunal remains in the form of carbonized or charred wood, nut shell, seeds, and spores, and calcined (burned) bone fragments was excellent in area D. The low silt content, and well drained nature of the sand in area D resulted in low levels of retained moisture which probably accounts for the preservation. Vertical and horizontal stability were preserved by the presence of hearth stone, lithic flake concentrations, or a large artifact. This prevents/minimizes microbioturbation. Pits and basins filled with large quantities of carbonized and calcined material also added to the assurance of position integrity, and may have aided in preservation.

Area B (also area A): The preservation of carbonized and calcined material in area B (and A) at Cactus Hill was not as complete as noted in area D. The higher silt content resulted in retention of higher levels of moisture in the deposit. The appearance of both carbonized wood and nut shell, as well as calcined bone, was eroded and soft. The calcined bone was much chalkier in appearance in area B and retained little detail. Most of the bone recovered from contexts thought to be older than the Late or Middle Archaic period was unidentifiable. The single fragment of calcined bone from a Clovis hearth in level 5, square 0/9 plus -1/9, unfortunately was so eroded that identification was not possible (Whyte, Appendix E).

6. Completeness of the archeological record:

Area D: Of the 37 diagnostic projectile point/hafted biface types recovered on Cactus Hill (Appendix A), 17 types were recovered in the 1993 excavation in area D of the site. Of the 17 types present, 9 types were recovered in small numbers (4 or less), and the remaining 8 types were recorded in the following numbers: Halifax, 6; Morrow Mountain II, 15; Morrow Mountain I, 5; Kirk Serrated, 11; St. Albans, 6; Fort Nottoway, 14; Decatur, 19; and Palmer, 8. The major types accounted for 84 artifacts, while the minor types accounted for only 20 artifacts. The 8 major types recovered were in clear stratigraphic position in area D, but this was a very incomplete point type record (21.6%) considering the site total of 37 types.

Area B: This area produced 36 of the 37 diagnostic artifact types, and a complete picture of the number and lithic materials of each type recovered is presented in Appendix A. Area B was heavily occupied and contained a nearly complete record of the groups known to have occupied all areas of Cactus Hill. Unfortunately, given the heavy occupation and fairly shallow microstratigraphy, the culture sequence has been all but eliminated in this part of the site. The upper part of the deposit contained Middle Woodland artifacts (Appendix B) above all other prehistoric material. The very lowest part of the deposit contained Paleoindian artifacts. Where useful chronological data were recovered from area B, this was a result of: (1) radiocarbon dates from isolated features containing certain diagnostic types of tools and projectile points, (2) intact microstratigraphy in the areas of lower site use off the ridge centerline, and (3) from very low

(Paleoindian) or very high (Woodland) positions in the deposit of cultural materials. An intensive effort produced one acceptable 14C date for Clovis from this area of the site.

Floral Analysis

Wood charcoal samples recovered by NRS from Cactus Hill excavations in areas D and B using dry screen techniques were evaluated by Lucinda McWeeney and the analysis appears as Appendix D (1). This section summarizes some of McWeeney's findings and draws several conclusions, many of which are critical to the subsequent analysis of radiocarbon dates. Table 6.1 summarizes the wood charcoal types reported by McWeeney on the basis of date and cultural period. The thirty one samples of carbonized wood submitted to McWeeney contained from one to over 100 charcoal lumps per sample. The charcoal lumps were selected from features and general levels, and they represented from 100% to approximately 5% of the recovered sample up to about 100 pieces. Normally, wood charcoal was evaluated by McWeeney, and nut shell fragments and seeds were evaluated by others. This was a division of laboratory work based upon availability of the researchers. See Appendix D(2) provided by Margaret Scarry and Appendix D(3) provided by Cheryl Holt which concerns other aspects of the floral analysis.

Only eight wood identifications were made: White pine, hard southern pine, pine, conifer, hickory, white oak group, red oak group, and oak. This is a fairly low number as compared to the numbers reported from some of the sites of equivalent age on the Little Tennessee River (Chapman 1979). McWeeney (Appendix D (1)) concludes that this may suggest a strong preference on the part of the inhabitants for certain wood types for fires. Selection bias, and preservation of carbon both must be important factors in what we see in the archaeological record at Cactus Hill. Still, at other sites researchers have concluded that there was indifference on the part of the inhabitants to the selection of wood types for ordinary cooking and heating (Chapman 1979). At the Koster site Asch, Ford, and Asch (1972) concluded that the entire spectrum of deadwood and fallen branches must have been used, as the diversity in the archaeological record approached the diversity in the modern forest. The situation concerning selection bias/availability of wood for cooking and heating on Cactus Hill is unresolved.

Another interesting observation which can be made with the small sample is that the conifers disappear (from our samples) at approximately 8,700 to 8,900 B. P. While the Early Archaic hearths often contain pine, no pine was identified from Middle or Late Archaic hearths. The two samples representing pre-Clovis and Clovis time periods are exclusively pine. This observation is exactly opposite the observation made by Chapman (1979), on a much larger sample, for sites in the Little Tennessee River Valley. There Chapman observed that pine was often rare in the Early Archaic but tended to increase significantly over time.

The data from Cactus Hill are supported by the late-Pleistocene/Holocene pollen samples from the Dismal Swamp (Whitehead 1972). The Zone 2 samples (>8,200 B. P.) show decreasing pine while the Zone 3 samples (6,000 B. P.) and the Zone 4 samples (<3,500 B. P.) do not show significant amounts of pine. These samples are contrasted with the Zone 1 samples (>10,000 B. P.) which show large amounts of pine.

In one very carefully excavated location (square N5E4) of area D on Cactus Hill, 24 Archaic period hearths or hearth-like features were recovered (see Table 5.2). These hearth features are presented in terms of percentage nut shell vs. percentage wood charcoal in Table 6.2. In thirteen of the 24 features, the carbonized remains were 50% or more hickory nut shell. And, hickory nut shell was significantly present (20% or more) in 17 of the 24 hearths. No Early Archaic feature dating 8,900 B. P. or earlier contained more than 15% of hickory nut shell, although some nut shell and wood charcoal from these features was hickory. The implication is that hickory nuts were abundant (available for utilization) on Cactus Hill only late in the Early Archaic, Middle Archaic, and Late Archaic periods (after ca. 8,700 B. P.) and were heavily exploited. Also, these data, and the general wood charcoal analysis from the hearth features on Cactus Hill, suggest an oak-hickory forest after ca. 8,900 B. P. without a significant pine (or hemlock?) component. Not even a trace of hemlock has been identified in the wood charcoal, although this may be due to problems with identification,

preservation, and/or poor qualities as a fuel. The deep, well-drained sandy soil on the site would not have been conducive to hemlock growth, and it is likely that most of the river bottomland in this area was relatively free of hemlock. These observations point to "rivers" of bottomland soil containing highly productive oak-hickory forests throughout most of the Archaic period. These forests may have occupied the sandy river valleys of the time on the Chowan, Blackwater, Nottoway, and areas on the Meherrin. The adjacent uplands, which may have contained significant components of pine and hemlock, at various times, would have been less productive and do produce fewer sites.

Table 6.1. WOOD CHARCOAL TYPES BY DATE AND CULTURAL PERIOD [1]

Date Or Approx. Time Period B.P.	Wood Types - Common Name [2]	Cultural Period
15,070 ±70	White Pine	Pre-Clovis (cultural ?)
10,920 ±250	Hard Southern Pine	Clovis
9,240 ±190 9,140 ±50	Oak, hickory, pine, hard pine	Early Archaic
9,155 ±80	Oak, hickory	Early Archaic
Ca. 9,100 to 9,500	Oak, hickory	Early Archaic
Ca. 9,000	Oak - WOG, Oak - ROG, hickory, hard pine	Early Archaic
8,940 ±60	Oak, conifer	Early Archaic
8,920 ±65 8,800 ±120	Oak, hickory	Early Archaic
Ca. 8,700 to 8,900	Oak - WOG	Early Archaic
Ca. 8,700 to 8,900	Conifer, oak - WOG, hickory	Early Archaic
Ca. 8,300	Oak - WOG, hickory	Early Archaic/Middle Archaic transition
Ca. 8,000	Oak - ROG, hickory	Middle Archaic
Ca. 8,000	Oak, hickory	Middle Archaic
Ca. 6,500	Oak - WOG	Middle Archaic
Ca. 6,500	Oak - ROG, hickory	Middle Archaic
5,180 ±60	Oak	Middle Archaic (Late)
4,980 ±170	Hickory, Oak (?)	Middle Archaic (Late)
4,850 ±70	Oak - WOG, hickory (?)	Middle Archaic (Late)
4,070 ±80	Oak - WOG	Late Archaic

Notes: [1] From Appendix D1 identifications by L. McWeeney based upon individual samples from area D and area B on Cactus Hill.
[2] WOG=white oak group; ROG=red oak group; ?=possibly present

Table 6.2. HEARTH FEATURES BASED ON PERCENT WOOD VS. NUTSHELL, CACTUS HILL AREA D, SQUARE N5E4

Feature # (N5E4-F)	Level	FCR Y/N (Yes or No)	Carbonized Remains (Approximate percentage) [1]		Date B. P. (Before Present)	Comments
			Wood	Nut Shell		
1	2	N	5%	95%	ca. 4,000-5,000	Pit hearth
2/9	2-9	N	5%	95%	ca. 4,000-5,000	Top of deep pit (hearth?)
3	2	N	5%	95%	ca. 4,000-5,000	Oval basin hearth
4	1-2	N	5%	95%	ca. 4,000-5,000	Oval basin hearth
5	2	N	5%	95%	ca. 4,000-5,000	Oval basin hearth
6	2	N	5%	95%	ca. 4,000-5,000	Oval basin hearth
7	3	Y	10%	90%	ca. 4,000-5,000	Circular FCR hearth
8	3	Y	80%	20%	4,070 +/-80	Circular FCR hearth
9/2	2 - 9	N	1-2%	98-99%	4,850 +/-70	Deep pit (hearth?) bottom
10	4 - 5	Y	50-60%	40-50%	ca. 5,000-7,000	Circular FCR scatter
11/18	4	Y	80-90%	10-20%	ca. 6,000-7,000	Circular FCR pit hearth
12	4	Y	80-85%	15-20%	ca. 6,000-7,000	Hearth scatter, some FCR
13	4	Y	50%	50%	ca. 6,000-7,000	Hearth scatter, some FCR
14	4	Y	1-2%	98-99%	ca. 6,000-7,000	Hearth scatter, some FCR
15/17	4-5	Y	0-1%	99-100%	ca. 7,800-8,000	Circular FCR pit hearth
16	5	Y	10-20%	80-90%	ca. 7,800-8,000	Circular FCR pit hearth
17/15	5	Y	50%	50%	ca. 7,800-8,000	Circular FCR pit hearth
18/11	5	Y	85%	15%	ca. 6,000-8,000	Circular FCR pit hearth
19	4-5	N	95%	5%	ca. 7,800-8,000	Circular carbon scatter
20	6	N	70-80%	20-30%	ca. 8,000-9,000	Under slab mortar
21	5-6?	N	75-80%	20-25%	ca. 7,000-8,500	Oval pit-like hearth (intrusive?)
22	7	N	85%	15%	9,140 +/-50 9,240 +/-190	Circular basin hearth
23	7-8	N	95-98%	2-5%	ca. 9,100-9,400	Oval carbon scatter (hearth?)
24	8	N	95%	5%	8,940 +/-60 (downdrift) ca. 9,250-9,500	Working surface, possible hearth

Notes: [1] Percentage based on number of pieces of wood charcoal and nut shell recovered in a feature sample. The sample represented 5% to 100% of the feature contents, based upon total volume. Separation of wood and nut shell from the sandy matrix was by dry (window) screen, analysis by NRS.

Radiocarbon Dating of Features and Levels

Introduction

Sixteen samples were submitted by NRS for 14C assays from levels and features on the Cactus Hill Site in areas D and B. All sixteen samples were either carbonized wood or nut shell; no samples were determined to have originated from modern contaminants. Two laboratories provided analysis services, Beta Analytic (Beta) of Coral Gables, Florida analyzed eleven samples, and the University of Arizona (AA) at Tucson analyzed the other five. The samples were from two contexts within the deposits on the Cactus Hill Site. The first context was the general levels. Samples, normally single lumps of charcoal, from general levels were not necessarily associated with any particular feature. These samples were tested to determine the integrity of the general level containing certain diagnostic artifacts or features. The second context was hearths, or hearth-like features, and fire pits containing multiple charcoal fragments. These features were either the direct object of the attempted assay, or they were associated with artifacts to be dated.

The primary attention was given to dating Paleoindian and Early Archaic traditions. An important consideration also was the dating of specific feature types such as rock hearths, basin

hearths, and fire pits. This was to determine the time periods in which certain types of features were popular, and to determine if features were of the same age as the levels in which they were excavated.

Results

The results of the sixteen 14C assays are given in detail in Table 6.3. These results are summarized below by period.

Paleoindian

Four charcoal lumps from area B, square 2/9, level 5 analyzed by AA were determined not to have been from fires associated with the Paleoindian occupation of this level the site, but represented intrusion and/or downdrift from upper levels. It is interesting that projectile points from pit hearths intrusive into level 5 were Halifax and Morrow Mountain I. Three of the four 14C assays were representative of time periods associated with Halifax and Morrow Mountain I and II. The AA 9,155 ±80 B. P. date appears to have been associated with Palmer/Kirk Corner-Notched occupation of level 4 and level 5.

The Beta 9,790 ±200 B. P. date from the upper portion of feature 1 of level 5 of square 0/9 plus -1/9 (salvage excavation A) in area B represented a Clovis hearth of carbonized southern pine which subsequently was determine to have contained downdrift of partly carbonized oak and hickory (McWeeney, Appendix D (1)). A second date from the lower portion of the hearth contents, which contained no partly carbonized material and was composed of carbonized hard southern pine (based on an identification by L. McWeeney), produced a Beta date of 10,920 ±250 B. P. The Beta 9,790 B. P. date is rejected based on contamination, and the Beta 10,920 B. P. date is considered acceptable for the Clovis occupation of this site.

While no features with carbon were found at the Clovis level 5 of square 2/9 of area B, a hearth-like scatter of carbonized white pine was found 3 inches (7.6 cm) below level 5 and in level 6 near the level 7 interface. This hearth-like amorphous scatter of carbon was associated with seven quartzite flakes and three quartzite core blades, and produced a Beta date of 15,070 ±70 B. P. This feature (2/9-6-F1) was directly under the Clovis working surface, and the carbon was submitted for 14C assay based on the belief that it probably represented a deep Clovis hearth. There was no observed difference in the appearance of this feature and the appearance of the feature in level 5 of square 0/9 plus -1/9 which produced the Beta date of 10,920 B. P. But, of the two features only the feature in level 5 of square 0/9 plus-1/9 produced Clovis-like chert tools. Eight other carbon samples collected on a grid pattern from squares 2/9, 1/9 and 0/9 plus-1/9 from levels 5, 6, and 7 were rejected for dating because they could not be associated with a feature and they contained contaminants in the form of partly carbonized downdrift. None of these other samples was directly below the *in situ* Clovis working surface as was the white pine feature in level 6 of square 2/9.

Palmer/Corner Notched Kirk

A Palmer/Kirk working surface and carbon scatter was encountered as feature 24 in level 8 of square N5E4 of area D. This feature (N5E4-8-F24) was generally below a Decatur working surface to the north and directly below a group of Fort Nottoway tradition tools and a Fort Nottoway, side-notched projectile point base. The carbon, oak and an unidentified conifer, produced a Beta 14C assay of 8,940 ±60 B. P. This date is consistent with Fort Nottoway dates, but it is considered at least 200 to 400 years too late for Palmer. It is, therefore, rejected as resulting from downdrift or intrusion from the Fort Nottoway feature a few inches above.

Decatur

Two dates were obtained from feature 22 in level 7 of square N5E4 of area D. This feature (N5E4-7-F22) was a basin hearth filled with carbonized wood, bone and flakes, and it was associated directly with three Decatur points and point fragments. The Beta dates were 9,240 ±160 B. P. and 9,140 ±50 B. P. The older date was recovered from deep in the feature, intrusive into the Palmer/Kirk level and very likely contained some contamination from that level. The Beta date of 9,140 was obtained from the upper part of the feature toward the more isolated northeast corner, and it is considered uncontaminated and acceptable. Based on the stratigraphic position of Decatur, just below Fort Nottoway which is discussed below, the 9,140 ±50 B. P. date seems generally correct. The Decatur dates were on carbonized oak, hickory, pine, hard pine, and an unidentified wood.

Fort Nottoway

There are two dates from Cactus Hill which represent carbon from what was apparently a very large fire pit containing flakes, calcined bone, and two fitted fragments of a fire-cracked Fort Nottoway side-notched projectile point. Square N2E1, levels 6, 7, 8, and 9 produced carbon of oak, hickory, and unknown wood from this feature (N2E1-6/9-F1) which dated Beta 8,800 ±120 B.P. A single lump of carbon from level 9, below the other sample, dated AA 8,920 ±65 B. P. The latter sample was submitted in hopes that it might date chalcedony trim flakes in level 9 at the other end of the square which were thought to possibly represent a Paleoindian occupation. The carbon sample was intrusive, however, and was associated with the Fort Nottoway feature directly above. The Fort Nottoway occupation of this site is therefore set at approximately 8,750 to 8,950 B. P. and appears to coincide in time with the use of large corner notched Kirk points in West Virginia (Broyles 1971).

Fire Cracked Rock Hearths

Three circular fire cracked rock hearths from Cactus Hill were dated, two from area D and one from area B. Two of the hearths were pit-like and dated Beta 5,180 ± 60 B.P. and Beta 4,980 ± 170 B.P. The hearths were physically associated with working surfaces apparently older than the hearths. It appears that these features were intrusive into the earlier surfaces. The Beta 5,180 B. P. date was from a feature (N2E2-3-F1) associated with a Kirk Serrated point working surface in level 3 of square N2E2, area D, which apparently dates about 7,600 to 8,000 B. P. (see point description in Appendix A) on the Nottoway. The Beta 4,980 B. P. date was associated with three shouldered Guilford points which probably date 500 to 1000 years older than the hearth from level 2 to 3 in salvage excavation B of area B (feature Ex.B-2/3-F1). In both cases, only carbon below hearth stones was used for dating, and it is unlikely that there was any contamination of the samples. It is important to note that these features were not boiling stones, but were highly fractured stones (fire cracked rock) perhaps used on coals in pits for cooking. The one hearth (4,980 B. P.) contained hickory nut shell, the other (5,180 B. P.) contained primarily carbonized oak and hickory wood. Both features were probably associated with the Halifax Side-Notched point tradition.

The third rock hearth was circular and apparently a surface or shallow basin hearth which dated (Beta) 4,070 ± 80 B. P. This feature at level 3 of square N5E4, area D (N5E4-3-F8)was below a surface containing a small stemmed Late Archaic projectile point or drill tip, and intrusive into a level containing a Morrow Mountain I projectile point and debitage of that period. The date was on carbonized white oak and is apparently associated with the Savannah River tradition use of the site in the Late Archaic period.

Fire Pits

In addition to the Fort Nottoway fire pit noted previously, a much deeper pit was encountered from level 2 to level 9 in square N5E4, area D. This feature (N5E4-2/9-F2/9-F9/2) contained some minor amounts of wood and over 200 grams of carbonized hickory nut shell. There were no diagnostic artifacts in this very distinctive feature which produced a date of (Beta) 4,850 ±70 B.P. The date indicates a probable association with the Halifax tradition, although no Halifax points were recovered in the N5E4 excavation unit. A very similar feature excavated in 1995 on the Grey Site in the Nottoway drainage also contained a large amount of hickory nut shell and was associated with three Halifax projectile points (McAvoy, report in preparation).

Summary

A summary culture sequence developed by the NRS for this region of southeastern Virginia is presented later in Table 6.7, based on the 14C dates for the Slade Site and Cactus Hill. A dated span from 4,070 B. P. to 10,920 B. P. is indicated with a questionable older data point of 15,070 B. P. Acceptance of the older data point will require the discovery of more sites of this period in eastern North America.

Table 6.3. RADIOCARBON DATES FROM AREAS B AND D, CACTUS HILL SITE, 44SX202, NOTTOWAY RIVER SURVEY EXCAVATIONS 1993 AND 1994

Component, Status of Date	Date B. P. Radiocarbon * Years	Lab #	Area, Square, Level, Feature	Feature/Location, Description and Associated Artifacts	Carbon Source (Carbonized Material)	Comments
Very early, hearth-like, acceptable date	15,070 ±70	Beta-81590 (AMS)	Area B, Sq. 2/9, L.6, Fea. 1 (2/9-6-F1)	Hearth-like, amorphous scatter of carbonized wood with blade-like flakes, designated feature -1 of Level 6	White pine (These were the only samples of white pine from Cactus Hill)	Under a Clovis working surface in Level 5, this samples was 3" below Clovis material and in Lev. 6
Clovis hearth, acceptable date	10,920 ±250	Beta-81589	Area B Sq. 0/9 plus -1/9, L.5, Fea. 1 (0/9 plus -1/9-5-F1); lower 1/2 of feature contents	Hearth, open scatter, Williamson and Mitchell quarry unifacial chert tools-Clovis	Hard pine (Southern)	Sample hard pine only (see McWeeney's report Appendix D (1))
Clovis hearth, unacceptable date (downdrift)	9,790 ±200	Beta-80181	Area B, Sq. 0/9 plus -1/9, L.5, Fea. 1 (0/9 plus -1/9--F1); upper 1/2 of feature contents	Hearth, open scatter Williamson and Mitchell quarry unifacial chert tools-Clovis	Mixed sample of hard pine, oak and hickory	Oak and hickory were incompletely carbonized and represent typical downdrift from multiple upper levels
Clovis level, unacceptable dates (downdrift)	9,155 ±80, 6,905 ±55, 6,580 ±55, 5,285 ±50	Arizona (AA) 15023, 15026, 15025, 15024 (all AMS)	Area B Sq. 2/9, L. 5, general area	Silt banded regions of Level 5 in general Clovis areas, or near Clovis artifacts, no features	All dates on single lumps of carbon (pine, oak, and hickory)	No dates acceptable as Paleoindian, all dates correspond to Archaic Level downdrift into Level 5 and deep Middle Archaic pit features
Palmer level, unacceptable date (downdrift)	8,940 ±60	Beta-81591 (AMS)	Area D Sq. N5E4 L. 8, Fea. 24 (N5E4-8-F24)	Working surface and hearth area with Palmer point, wedge, and end scraper, below Fort Nottoway surface.	Mixed sample, oak and conifer	Date unacceptable due to downdrift/disturbance from Fort Nottoway features above Palmer feature
Decatur hearth, Questionable date (mixed?)	9,240 ±190	Beta-80182	Area D, Sq. N5E4, L. 7, Fea. 22 (N5E4-7-F22)	Deep sample from Decatur basin hearth with flakes, bone, Decatur points and tools	Mixed sample, oak, hickory, pine, hard pine, and unknown wood	Date is questionable as the sample appears to have contained some carbonized wood from the Palmer level below the Decatur surface, deep basin feature intrusive into Palmer level
Decatur hearth, acceptable date	9,140 ±50	Beta-83012 (AMS)	Area D, Sq. N5E4, L. 7, Fea. 22 (N5E4-7-F22)	Shallow sample from northeast corner of hearth, Decatur points and tools, above Palmer level	Mixed sample, oak, hickory and hard pine	Sample taken to northeast of and in feature 22, shallow and away from Palmer and Fort Nottoway features, most acceptable date for Decatur

Table 6.3. RADIOCARBON DATES FROM AREAS B AND D, CACTUS HILL SITE, 44SX202, NOTTOWAY RIVER SURVEY EXCAVATIONS 1993 AND 1994

Component, Status of Date	Date B. P. Radiocarbon * Years	Lab #	Area, Square, Level, Feature	Feature/Location, Description and Associated Artifacts	Carbon Source (Carbonized Material)	Comments
Fort Nottoway, pit hearth, acceptable date	8,800 ±120	Beta-70127	Area D Sq. N2E1, L. 6, 7, 8 and 9, (N2E1-6/9-F1)	Deep pit hearth from Level 6 to Level 9, fire cracked Fort Nottoway point in levels 6 and 7, mixed with the carbonized wood	Mixed sample, oak, hickory and unknown wood	Feature 6 was identified in the laboratory based on field collected samples, notes and the floral analysis, this feature could not be observed as a pit in the field
Fort Nottoway, Pit hearth, acceptable date	8,920 ±65	AA-15027 (AMS)	Area D Sq. N2E1, L. 9, (N2E1-6.9-F1)	Deep sample from Level 9, bottom of pit hearth, feature 6 (?)	Single lump of oak	Sample was very deep, but directly below the Fort Nottoway pit hearth in Levels 6, 7 and 8 above, it appears to associated with the pit
Fire cracked rock hearth (Halifax ?), acceptable date	5,180 ±60	Beta-83013 (AMS)	Area D, Sq. N2E2, L. 3, (N2E2-3-F1)	Fire cracked rock hearth- circular pit, intrusive into Kirk Serrated working surface	Mixed sample of oak and hickory, all carbonized wood recovered under hearth stones	Date of pit hearth feature does not match the surface it is intrusive into, the date suggests Halifax age not the Kirk Serrated working surface it was found on
Fire cracked rock hearth (Halifax or late Guilford), acceptable date	4,980 ±170	Beta-801183	Area B, Salvage excavation B, L. 2-3, Fea. 1 (Ex.B-2/3-F1)	Fire Cracked rock hearth, circular pit-like, associated with 3 shouldered Guilford points, but feature may be intrusive into Guilford working surface	All hickory nut shell, all recovered under hearth rocks	Date of FCR pit hearth feature seems late for Guilford, and may represent either the shouldered Guilford points or Halifax period, intrusive into Guilford working surface
Deep pit, Halifax (?)	4,850 ± 70	Beta-80184	Area D, Sq. N5E4, L. 2 to 9, Fea. 2 and 9 (N5E4-2/9-F2/9-F9/2)	Deep pit, hearth and/or storage pit, at Late Archaic to Late Middle Archaic level, no associated diagnostic artifacts	All hickory nut shell, all recovered throughout pit	This feature was a deep oval shaped pit filled with carbonized hickory nut shell and minor wood, the date indicates a possible Halifax association
Fire cracked rock hearth (Late Archaic, stemmed ?), acceptable date	4,070 ±80	Beta-80144	Area D, Sq. N5E4, L. 3, Fea. 8 (N5E4-3-F8)	Circular fir cracked rock hearth, surface, associated with stemmed point and Morrow Mountain-like point, association likely Late Archaic stemmed	White oak, all recovered under hearth stones	This feature was in a level producing Late Archaic to Late Middle Archaic material, the associations were late stemmed and Morrow Mt. I, the late stemmed point association seems correct

Notes: *Corrected for 13C/12C ratio

Faunal Analysis

Area D of Cactus Hill produced most of the sample of 1,098 calcined faunal remains recovered in the excavations of 1993 and 1994. All remains were recovered by the NRS in area B and area D, but due to soil conditions the area D remains were extremely well preserved. The few remains recovered in area B were much more chalky, weathered, and eroded. The faunal analysis of the Cactus Hill assemblage was performed by Thomas R. Whyte, of the Department of Anthropology at Appalachian State University, and his work appears as Appendix E. It is Whyte's opinion that the archaeo-faunal remains from Cactus Hill, though relatively few, represent the best preserved and dated Early Holocene assemblage from the Middle Atlantic region.

The Early Archaic sample was the most complete and was bracketed by a number of radiocarbon dates from 9,240 ±190 B. P. to 8,800 ±120 B. P. Specific identifications were made for perch-like fish, bullfrog, king/milk snake, mud/musk turtle, turkey, muskrat, and white-tailed deer. Also, there were a number of more general identifications. Fewer identifications were made for the Middle and Late Archaic as less data was recovered from these periods. The single fragment of calcined bone from the Paleoindian period was recovered in area B, but was unidentifiable except as probably a scapula of a large ungulate.

Whyte notes (Appendix E) that the faunal remains provide no direct or measurable record of environmental change for the Archaic period of Virginia's inner Coastal Plain. The species reported by Whyte are common in the area of the site today. While the quantity of white-tailed deer may reflect an animal which played a more focal role in the annual diet, the overall assemblage is indicative of generalized foraging. Such activities are interpreted by Whyte as probably on a seasonal basis throughout the early to mid Holocene.

Whyte also stresses the point that what is recovered incinerated as food residue, or through refuse disposal, is not necessarily indicative of each prey species. Large mammals are given as an example of food which could be processed at a kill site without the return of bone with the meat and hide to the residence. The Cactus Hill faunal assemblage, therefore, is probably only a partial representation of what was hunted.

In several instances the faunal remains provided to Whyte for analysis (recovered in hearth or pit features or general levels), were with carbonized floral remains. In some of these instances the floral remains were submitted for identification and subsequent 14C assay.

Where the floral remains represent seeds, fruits, or spores from leaves, with a seasonal availability, this has been indicated in Table 6.4. These data provide some information on the seasonality of the hunting/gathering activities of the residents of Cactus Hill. One would expect that a disproportionate number of seeds and fruits would be available in the Fall, as Table 6.4 shows.

Of the 20 associations, 19 contained at least minor amounts of hickory nut shell, and five contained acorn which probably indicates site use around the month of October. Twelve of the associations were with features, as opposed to general levels. Of the twelve features, the contents of three features were subjected to flotation and produced fern spores (charred), as well as hickory nuts. This would tend to indicate a likely time span of April through September for the fern and then into October for the hickory nut use. This may indicate multiple use of the feature over the year, or more than a short stay at the site. It is interesting that where the flotation results containing seed and spore data are added to the macro dry screen data a somewhat different and perhaps more complete picture emerges as to a multiple seasonality of site use. (Flotation sample data analysis was provided by Cheryl Holt and appears in Appendix D (3)). Also, the faunal assemblage is not inconsistent with the proposed time of site use. The large number of turtle remains, for example, indicate spring through fall harvesting, and turkey and white-tailed deer were available all year.

Quarry activity on Cactus Hill may have been at a maximum in the month of October, as water levels in the river drop to the lowest point in this period.

*Table 6.4. FAUNAL REMAINS FROM CACTUS HILL COMPARED WITH ASSOCIATED FLORAL REMAINS BY SEASONAL AVAILABILITY**

Area D, Square, Level, and Feature (New Feature Number**) Probable Cultural Association	Faunal Remains/ Common Name (Appendix E Data)	NISP (Faunal)	Floral Remains by Seasonal Availability as Food from Associated Features (data from Appendix D1, D2, D3)
N2E1, level 1, feature 2 (N2E1-1-F2), Morrow Mt. II	Cf. painted turtle white-tailed deer	1 3	Hickory nut - October
N2E1, level 2, feature 4 (N2E1-2-F1), Morrow Mt. II	white tailed deer	1	Hickory nut - October Wolfberry - Fall
N2E1, level 3, Middle Archaic	Mud/box/pond turtle	1	Hickory nut - October Acorn - early Fall
N2E1, level 4, general area, Middle/Early Archaic	bullfrog Mud turtle	1 1	Hickory nut - October Cleaver seed - early Summer
N2E1, level 4, feature 5 (N2E1-4/7-F1), top of Palmer/Kirk hearth	Mud/box/pond turtle	1	Hickory nut - October
N2E1, level 5, feature 5 (N2E1-4/7-F1), Palmer?	Mud/box/pond turtle	4	Hickory nut - October Acorn - Early Fall
N2E1, level 6, feature 5 (N2E1-4/7-F1), Palmer?	Mud/box/pond turtle	1	Hickory nut - October Acorn - early Fall
N2E1, level 8, feature 6 (N2E1-6/9-F1), bottom of Fort Nottoway pit 8,800±120 B. P.	Mud/box/pond turtle gray/fox squirrel white-tailed deer	1 1 1	Hickory nut - October Acorn - early Fall
N2E1, level 9, feature 6 (N2E1-6/9-F1), below Fort Nottoway pit, 8,920 ±65 B. P.	Mud/musk turtle Mud/box/pond turtle	1 2	Acorn - early Fall
N0E0, level 1, Savannah River	Large bird Mud/box/pond turtle	1 1	Hickory nut - October
N0E0, level 2, feature 1 (N0E0-2-F1), Halifax	Wild turkey	1	Hickory nut - October
N1E0, level 2, Halifax	Mud/musk turtle White-tailed deer	1 1	Hickory nut - October
N1E0, level 3 Morrow Mt. (?)	White-tailed deer	1	Hickory nut - October
N1E0, level 6, Kirk Serrated	Wild turkey	1	Hickory nut - October
N1E1, level 1, Middle Archaic	White-tailed deer	11 1	Hickory nut - October
N2E3, level 6, Fort Nottoway/Kirk Corner-Notched	Mud/box/pond turtle Muskrat	1	Hickory nut - October
N5E4, level 2-9, feature 9 (N5E4-2/9-F9/2), Halifax (?) 4,850 ±70 B. P.	Mammal	1	Hickory nut - October Sumac - Jan. through Dec. Watershield - March, April, May, Sept., Oct. Fern - April, May, June (non-food use during spring and summer)
N5E4, level 5, feature 19 (N5E4-5-F19), Kirk Serrated	Large mammal Mammal	1 2	Hickory nut - October Fern - April, May, June (non-food use during spring and summer)
N5E4, level 7, feature 22 (N5E4-7-F22), Decatur 9,140 ±50 B. P.	Mammal Mud turtle King/milk snake	11 1 1	Hickory nut - October
N5E4, level 7-8, feature 23 (N5E4-7/8-F23), Kirk Corner-Notched	Large bird Mud/box/pond turtle Mammal	1 2 23	Hickory nut - October Fern - April, May, June (non-food use during spring and summer)

Notes: *From data provided by all researchers in Appendix D and Whyte in Appendix E. **New feature numbers are given in (-)

This allows greater access to the quartzite cobbles on the river shoals, channel and bars. This may be a partial explanation for the strong indication of site use in October.

Immunological Analysis of Stains on Lithic Artifacts

Currently, there is considerable debate over the accuracy and reproducibility of results of immunological analysis techniques for identification of old and denatured bloodstains on artifacts. However, seventy one artifacts from the Paleoindian and Archaic periods were tested by the cross-over electrophoresis (CIEP) method, and this method and results are presented by Newman for some of the Clovis artifacts in Appendix F. A summary of all of Newman's work on this project appears here in Table 6.5. These test results represent our only indication, although indirect, of the prey species of the Paleoindian groups.

In contrast, there is considerable direct information from stratified Archaic period deposits on the site. Many species were identified by Whyte in the Early, Middle, and Late Archaic strata at Cactus Hill from very small and fragmentary calcined bone fragments, and these results were presented previously in this chapter. Table 6.6 compares Newman's identifications with Whyte's findings by cultural period . It should be stressed that this comparison did not result from a structured scientific test, nor was any type of a test undertaken for the purpose of a scientific comparison of the direct and indirect analysis techniques. In fairness to the CIEP technique, it must be recognized that of 23 animal categories in Table 6.6, at least 14 of these were not tested for by CIEP. Also, no Late Archaic material was submitted for immunological analysis.

With these caveats, a few general observations may be made from the Table 6.6 data. Overlaps, or similar results from both analysis techniques were obtained in the Early Archaic period for deer, carnivore (cat), possibly squirrel, and possibly muskrat. For the Middle Archaic period, the single overlap was deer with a possible overlap for human. There was no overlap in the Paleoindian period as the only faunal (calcined) fragment was unidentifiable, except as representing a large mammal. One potential problem (?) with the CIEP data was a lack of identification of bird, although it was a CIEP test subject and it was identified six times in the faunal sample. Also, CIEP identified bovine (bison or musk ox), elk, and rabbit, but there were no faunal remains of these animals. Neither analysis technique identified bear, another CIEP subject.

Again, this was not a comparative test as there is really no direct relationship between the mechanism of preservation of calcined bone and residual protein, or the manner in which either form enters the archaeological record. What bone finds its way into a hearth to be incinerated as garbage may be vastly different than what was otherwise present on the site.

Table 6.5. RESULTS OF CIEP ANALYSIS

Artifact #	Test # and Date	Artifact Type	Period/Date Before Present (B. P.)	Results
1	1, 4/3/94	Side scraper	Paleoindian, 10,920+/-250 B. P.	Bovine
2	2, 4/3/94	Fluted point	Paleoindian	Negative
3	3, 4/3/94	Fluted point	Paleoindian	Deer, elk
4	4, 4/3/94	Fluted point	Paleoindian	Negative
5	5, 4/3/94	Edge worked flake and graver	Paleoindian	Rabbit
6	6, 4/3/94	Graver	Paleoindian	Deer
7	7, 4/3/94	Edge worked flake	Paleoindian	Bovine
8	8, 4/3/94	End scraper	Paleoindian	Negative
9	9, 4/3/94	Graver	Paleoindian	Bovine, rabbit
10	10, 4/3/94	End scraper	Paleoindian	Negative
11	1, 5/14/94	Kirk Side-Notched Projectile point	Early Archaic, ca. 9,000 B. P.	Negative
12	2, 5/14/94	Kirk Side-Notched Projectile point	Early Archaic	Negative
13	3, 5/14/94	Biface fragment	Early Archaic	Deer, elk

Table 6.5. RESULTS OF CIEP ANALYSIS

Artifact #	Test # and Date	Artifact Type	Period/Date Before Present (B. P.)	Results
14	4, 5/14/94	End scraper	Early Archaic	Negative
15	5, 5/14/94	Graver/awl	Early Archaic	Negative
16	6, 5/14/94	Flake scraper	Early Archaic	Negative
17	7, 5/14/94	Scraper/knife	Early Archaic	Deer, elk
18	8, 5/14/94	Utilized flake	Early Archaic	Negative
19	9, 5/14/94	Used cobble	Early Archaic	Negative
20	10, 5/14/94	Grinding stone fragment	Early Archaic	Negative
21	11, 5/14/94	Fort Nottoway projectile point	Early Archaic 8,920 +/- 65 B. P.; 8,800 +/-120 B. P.	Negative
22	12, 5/14/94	Fort Nottoway projectile point	Early Archaic	Negative
23	13, 5/14/94	Chopper/smoothing stone	Early Archaic	Negative
24	14, 5/14/94	Grinding stone fragment	Early Archaic	Negative
25	15, 5/14/94	Adz blade	Early Archaic	Negative
26	16, 5/14/94	Utilized flake	Early Archaic	Negative
27	17, 5/14/94	Flake/graver	Early Archaic	Negative
28	18, 5/14/94	Utilized flake	Early Archaic	Negative
29	19, 5/14/94	Fort Nottoway projectile point	Early Archaic	Negative
30	20, 5/14/94	End scraper	Early Archaic	Negative
31	21, 5/14/94	End scraper	Early Archaic	Negative
32	22, 5/14/94	Celt	Early Archaic	Negative
33	23, 5/14/94	Side scraper	Early Archaic	Negative
34	24, 5/14/94	Scraper/awl/graver	Early Archaic	Deer, elk
35	25, 5/14/94	Utilized flake	Early Archaic	Guinea pig
36	26, 5/14/94	Decatur projectile point.	Early Archaic, 9,140+/-50 B. P	Negative
37	27, 5/14/94	Decatur projectile point	Early Archaic	Deer, elk
38	28, 5/14/94	Decatur projectile point	Early Archaic	Negative
39	29, 5/14/94	Decatur projectile point	Early Archaic	Negative
40	30, 5/14/94	Decatur projectile point	Early Archaic	Guinea pig
41	31, 5/14/94	Palmer drill tip	Early Archaic	Negative
42	32, 5/14/94	Palmer projectile point	Early Archaic, ≥ 9,240+/-190 B. P.	Deer
43	33, 5/14/94	Palmer projectile point	Early Archaic	Negative
44	34, 5/14/94	Palmer projectile point	Early Archaic	Rat
45	35, 5/14/94	Palmer/Kirk projectile point	Early Archaic	Negative
46	36, 5/14/94	Palmer/Kirk projectile point	Early Archaic	Rabbit
47	37, 5/14/94	Palmer/Kirk projectile point	Early Archaic	Dog
48	38, 5/14/94	End scraper	Early Archaic	Cat
49	39, 5/14/94	End scraper	Early Archaic	Negative
50	40, 5/14/94	Flake knife	Early Archaic	Negative
51	1, 7/18/94	Clovis point	Paleoindian	Negative
52	1, 2/26/95	Early triangular	Early Paleoindian (?)	Human, rabbit
53	2, 2/26/95	Early triangular	Early Paleoindian (?)	Negative
54	3, 2/26/95	Kirk-like projectile point (deep notched)	Early Archaic, ca. 9,500 B. P.	Negative
55	4, 2/26/95	LeCroy projectile point	Early Archaic/Middle Archaic transition, ca. 8,300 B. P.	Negative
56	5, 2/26/95	LeCroy projectile point	Early Archaic/Middle Archaic transition	Negative
57	6, 2/26/95	Kirk Serrated projectile point	Middle Archaic, ca. 7,800 B. P.	Negative
58	7, 2/26/95	Kirk Serrated projectile point	Middle Archaic	Negative
59	8, 2/26/95	Kirk Serrated projectile point	Middle Archaic	Negative
60	9, 2/26/95	Kirk Serrated projectile point	Middle Archaic	Deer
61	10, 2/26/95	Kirk Serrated projectile point	Middle Archaic	Deer

Table 6.5. RESULTS OF CIEP ANALYSIS

Artifact #	Test # and Date	Artifact Type	Period/Date Before Present (B. P.)	Results
62	11, 2/26/95	Bifurcate base (?) projectile point	Middle Archaic	Human, rabbit
63	12, 2/26/95	Stanly stemmed projectile point	Middle Archaic, ca. 7,400 B. P.	Negative
64	13, 2/26/95	Morrow Mt. II projectile point	Middle Archaic, ca. 6,500 B. P.	Negative
65	14, 2/26/95	Morrow Mt. II projectile point	Middle Archaic	Negative
66	15, 2/26/95	Guilford projectile point	Middle Archaic, ca. 6,000 B. P.	Negative
67	16, 2/26/95	Guilford projectile point	Middle Archaic	Bovine
68	17, 2/26/95	Guilford projectile point	Middle Archaic	Negative
69	18, 2/26/95	Halifax projectile point	Middle Archaic/ Late Archaic transition, ca. 5,000 B. P.	Deer
70	19, 2/26/95	Halifax projectile point	Middle Archaic/Late Archaic transition	Negative
71	20, 2/26/95	Halifax projectile point	Middle Archaic/Late Archaic transition	Negative

Table 6.6. COMPARISON OF FAUNAL IDENTIFICATIONS WITH IMMUNOLOGICAL (CIEP) TEST RESULTS, BY CULTURAL PERIOD AT CACTUS HILL

Common Name or Group	Period (see notes)				Comments
	Paleoindian	Early Archaic	Middle Archaic	Late Archaic	
Bovine	--/I	--/--	--/I	--/NA	Bison or musk ox only
Elk	--/I	--/I	--/--	--/NA	I=elk specific deer reaction
Deer	--/I	F/I	F/I	F/NA	--
Rabbit	--/I	--/I	--/I	--/NA	--
Carnivore/cat	--/I	F/I	--/--	--/NA	--
Gray/fox squirrel (Guinea pig)	--/--	F/(I)	--/--	--/NA	(I)=match with (-)
Muskrat (rat)	--/--	F/(I)	--/--	--/NA	(I)=match with (-)
Dog	--/--	--/I	--/--	--/NA	--
Human	--/--	--/NA	(?) F/I	(?) F/NA	(?)=level unsure; cremation burial (?)
Cervidae	--/NA	F/NA	--/NA	--/NA	deer or elk (antler)
Indeterminate large mammal	F/NA	F/NA	F/NA	F/NA	any of several possible
Indeterminate mammal	--/NA	F/NA	F/NA	F/NA	many possible
Wild turkey	--/--	F/--	F/--	--/NA	--
Indeterminate large bird	--/NA	F/NA	--/NA	--/NA	probably wild turkey
Indeterminate bird	--/NA	F/NA	--/NA	--/NA	many possible
Perch-like fish	--/NA	F/NA	--/NA	--/NA	--
Bullfrog	--/NA	F/NA	--/NA	--/NA	--
Mud turtle	--/NA	F/NA	F/NA	--/NA	--
Mud/musk turtle	--/NA	--/NA	F/NA	--/NA	--
Stinkpot turtle	--/NA	F/NA	F/NA	--/NA	--
Painted turtle	--/NA	F/NA	--/NA	--/NA	--
Eastern box turtle	--/NA	F/NA	F/NA	F/NA	--
King/mild snake	--/NA	F/NA	--/NA	--/NA	--
Indeterminate vertebrate	--/NA	F/NA	F/NA	F/NA	--

Notes: General symbols: F=found in the faunal analysis; I=tested positive in immunological (CIEP) test; NA=not applicable as the immunological test would not indicate such a presence, or immunological test not performed.
-- =not found.

Chronological Sequence of Diagnostic Artifacts - Areas D and B

The chronological sequence of diagnostic artifacts is presented in this section based upon the laboratory analysis of the excavated artifacts presented earlier in Chapter 5. An understanding of vertical integrity of the microstratigraphy in areas D and B, as discussed previously in this chapter, factors into the establishment of such a sequence. Finally, the radiocarbon dates also presented previously in this chapter were used with the stratigraphic sequence data to finalize the chronological sequence of diagnostics. This section is directed only to the diagnostic artifact sequence. For a discussion of the other elements of material culture associated with these diagnostic artifacts, see Chapter 5. More detailed information concerning the traditions represented by the diagnostic artifacts is presented in Chapter 5 and Chapter 7.

The laboratory analysis of the projectile points recovered from Cactus Hill excavations D and B revealed at least 37 point types which are defined in Appendix A. Figure 6.1 presents these point types in two sequences as interpreted from the Cactus Hill data. The column of artifacts to the left of the vertical line in the center of the figure defines the excavated or 14C dated sequence composite from areas D and B. The column to the right is the proposed chronological position of the diagnostic artifacts not recovered in a clear stratigraphic context and/or not accurately 14C dated. There are only 9 diagnostic artifact types which were clearly excavated in sequence or dated upon Cactus Hill. The remaining 28 types were placed in an approximate sequence based upon more general Cactus Hill data, previous work by NRS on the Fannin or Slade Sites (up river), or based upon the work of other researchers. References related to these point types are presented in Appendix A.

The following 9 diagnostic point types were suitably recovered to indicate culture sequence:

Halifax: Excavated *in situ* in area D, squares N0E0 and N1E0 above Morrow Mountain II. There is no 14C date for Halifax on Cactus Hill. The type was dated on the Slade Site (see Table 6.7).

Morrow Mountain II and Morrow Mountain I: Excavated *in situ* in area D, in numerous squares. The Morrow Mountain II points were recovered above Morrow Mountain I, and both were recovered below Halifax and above Kirk Serrated. There is no 14C date for Morrow Mountain on Cactus Hill. The type II was dated on the Slade Site. (see Table 6.7).

Kirk Serrated: Excavated *in situ* in area D below Morrow Mountain in four units. Excavated above St. Albans in units N1E0 and N2E0. There is no 14C date for Kirk Serrated on Cactus Hill, or on any site in this area of the Nottoway.

St. Albans: Excavated *in situ* above and with Fort Nottoway in area D in units N1E0 and N1E2. Excavated *in situ* below Kirk Serrated in units N1E0 and N2E0. There is no 14C date for St. Albans on Cactus Hill or on any site on the Nottoway.

Fort Nottoway: Excavated *in situ* with and below St. Albans in area D in units N1E0 and N1E2. Excavated above Decatur in units N1E1 and N2E3. There are two 14C dates for Fort Nottoway on Cactus Hill presented in Table 6.7.

Decatur: Excavated *in situ* below Fort Nottoway in several units noted above in area D. Excavated marginally above Palmer and Kirk Corner-Notched (early variety - Large Palmer) in units N1E1 and N5E4. There are two 14C dates one acceptable) for Decatur on Cactus Hill presented in Table 6.7.

Palmer: Excavated *in situ* below Decatur in two units (noted above) in area D. Excavated marginally above Clovis in unit 2/9 level 4 area B. There is no acceptable date for Palmer from the Cactus Hill Site, but the apparent age is >9,240 ±190 B. P. This is based on a date from a deep Decatur hearth, intrusive into the Palmer level 8, of unit N5E4 in area D.

Clovis: Excavated marginally below Palmer and marginally above quartzite core blades in unit 2/9 level 5 of area B on Cactus Hill. A single acceptable 14C date was obtained from a Clovis hearth in unit 0/9 plus -1/9 (salvage excavation A) in area B, and this is presented in Table 6.7.

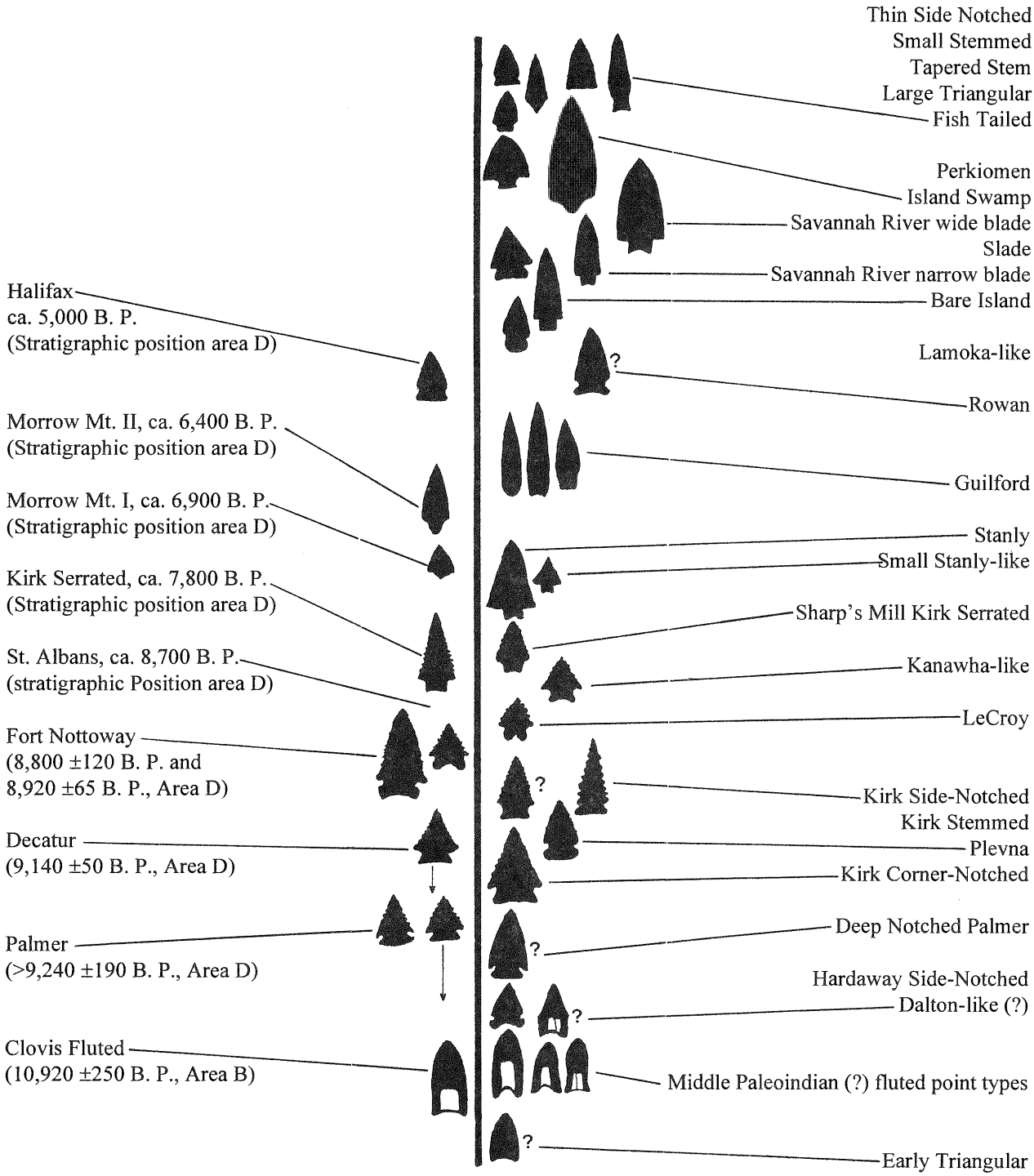


Figure 6.1. Diagnostic artifact sequence, Cactus Hill Site. Left, sequence as clearly excavated and/or 14C dated in area D, or as 14C dated in area B. Right, probable sequence for other diagnostic artifacts not adequately excavated in sequence in area D, and/or not 14C dated on this site.

Table 6.7. NOTTOWAY RIVER SURVEY SUMMARY RADIOCARBON DATED CULTURE SEQUENCE

Cultural or Temporal Marker	Site, Area excavated	Date in Radiocarbon Years B. P.	Feature/Circumstances
Possibly cultural, very early (No diagnostic artifacts)	Cactus Hill, Area B	15,070 ±70, Beta-81590	Hearth (?) scatter, carbonized white pine; core blade flake tools
Clovis	Cactus Hill, Area B	10,920 ±250, Beta-81589	Hearth carbonized southern hard pine; unifacial blade tools
Palmer	Cactus Hill, Area D	(>)9,240 ±190, Beta-80182	Mixed carbon sample; Palmer and Decatur features, Levels 7 and 8, Sq. N5E4, Area D
Decatur	Cactus Hill, Area D	9,140 ±50, Beta-83012 (<) 9,240 ±190, Beta-80182	Hearth, basin-like, carbonized oak, hickory, and hard pine
Fort Nottoway	Cactus Hill, Area D	8,800 ±120, Beta-70127; 8,920 ±65, AA-15027	Pit hearth, carbonized oak, hickory and unknown wood
LeCroy	Slade, Area 7C3C	8,300 ±110 Beta-16255	Fire Cracked rock hearth, carbonized hickory nut shell, large working surface
Stanly level (mortar)	Slade, Area 7C3D	7,420 ±160, Beta-24427	Mortar at Stanly level; carbonized hickory nut shell and wood under mortar
Morrow Mt. II (small variant, originally incorrectly typed as a Morrow Mt. I)	Slade, Area 7C1	6,470 ±90, Beta-22838	Hearth pit with calcined bone and carbonized plant remains and nut shell
Halifax	Slade, Area 7C1	5,050 ±400, Beta-15529	Pit hearth with fire cracked rock, and carbonized hickory nut shell, very small sample
Savannah River (narrow blade)	Slade, Area 7C5	4,070 ±80, Beta-22156	Large fire cracked rock hearth, and carbonized hickory nut shell

Chapter 7

A Summary of Traditions

This chapter presents a brief summary of the traditions discussed in this report with some general conclusions. A convenient summary of some of this information appears as Table 7.1 based on information generated in area B of the site. Only area B data were used for the table summary because only area B produced an adequate representation of all of the temporal markers (point types) from Cactus Hill.

The Earliest Inhabitants

When the Cactus Hill Site in southeastern Virginia was first visited by humans traveling in the Nottoway River Valley is unknown, but there is some evidence that the first visitors had arrived between 11,000 and 15,000 B. P . These Ice Age visitors appear to have stayed long enough to build fires and to make and sharpen stone tools, but with these activities left only faint evidence of their presence. A possible surface hearth represented by a scatter of white pine charcoal and a few core blade tools dating 15,070 ±70 B. P. was preserved on the ridge top in area B of the site below a working surface of the Paleoindian Clovis hunters. This date represents radiocarbon years before present (RCYBP) which may be equivalent to a date in calendar years as much as 2,000 to 3,000 years older based upon the generally accepted difference in radiocarbon years and calendar years for very old samples. The later Clovis activity was dated to 10,920 ±250 B. P. (RCYBP).

The earliest people may have used a thin, lanceolate, almost triangular projectile point as two of these unusual spear tips have been recovered from this area of the site. Both were excavated below Clovis age artifacts in fairly good stratified context on the ridge top at area B. Several spear tips similar to the earliest recovered at Cactus Hill were reported from the lowest levels of the Hardaway Site, in the Uwharrie Mountains of North Carolina, by Joffrey Coe 30 years ago (Coe 1964). These similar bifaces were described as Hardaway blades. Also, the Meadowcroft Shelter in western Pennsylvania reported by Adavosio (1978) produced the primary evidence for a human presence in this estimated age range. Core blades were reported by Adavosio as associated with pre-Clovis site use.

These people at Cactus Hill appear to have been making tools from the better grades of local chert and quartzite stone materials, and good grades of metavolcanic materials similar to those from the Carolina Piedmont. Core blades, blade cores, worked flakes, and lanceolate/triangular projectile points or bifacial knives made up their tool kit used in this area. One other site on the Nottoway River, Slade 44SX7, produced a similar early triangular projectile point in the lowest level of excavation area E, below a Late Paleoindian Hardaway Side-Notched camp. The Baskerville Site 44SX137, a surface deposit 10 miles upriver, also produced a similar assemblage of tools, but temporal placement is unknown.

We have no remains of the game animals hunted by these earliest people, but indirect tests through residual protein analysis suggest that rabbit was some part of their diet. These tests, however, are considered controversial and unreliable by some researchers. Overall, the evidence suggesting that these people existed at all is scant, but it does exist and must be addressed.

In contrast to the positive evidence presented above which points to the existence of this early tradition on the Nottoway River, the negative side of the argument also must be reviewed. Only a small to moderate number (15 to 20) of these artifacts/formal tools have been recovered below Clovis on Cactus Hill in a good context. This represents an assemblage about the size of that recognized for the Hardaway Side-Notched tradition. While area B has produced Paleoindian material representing several periods/traditions, the stratigraphy in area B has demonstrated far less integrity than in adjacent area D of the site. Area B at Cactus Hill would not be

considered suitable for establishing other than general stratigraphic relationships in the Archaic period. There is , however, less disturbance in the Paleoindian levels and in the Middle Woodland levels due to lower site use in these periods.

The artifacts assigned to this early (blade core) tradition are quite unusual, but taken individually they are not unique. A triangular biface without side notches was recovered with a Hardaway Side-Notched point on the ridge top at area B, and a Decatur tradition bifacial knife also is lanceolate/ triangular in shape. These artifacts are somewhat similar to the early triangular point type defined on Cactus Hill, and because of their age they also would be in a stratigraphic context near the bottom of the cultural deposit. Drift of such artifacts below Clovis would be possible. Blade cores and good core blades while rare have been recovered in Palmer and Fort Nottoway tradition artifact clusters on Cactus Hill, and they were made of local quartzites. But, it is rare to find them as symmetrical as those which were recovered below Clovis.

The hearth-like scatter of carbonized white pine producing a 15,070 B. P. date recovered in square 2/9 level 6, below Clovis, could have been the remnants of a forest fire or an individual lightening strike. This would be a unique occurrence on this site, as no other examples have been discovered of fires created by natural forces. An effort was made to locate wood charcoal deep in the geological deposits to help establish the age of the eolian sands, but none has yet been found. The age of the carbonized wood, and the identification as white pine, seem compatible for this area of Virginia, and there is little chance that the sample was contaminated in the eolian sand with older carbon. There were ten quartzite flakes associated with this feature and three of the flakes were core blades. Quartzite flakes were recovered in the Palmer/Clovis levels, 4 and 5 directly above, and they probably originated there, or as downdrift, from the Middle or Early Archaic. Still, none of these flakes was a core blade as recovered with the carbonized white pine scatter. Even if the carbonized white pine is the result of a natural event it is probably in the correct position stratigraphically and represents a dated reference point in the site development. The quartzite core blades would then be bracketed between dates of 10,920 ±250 B. P. for Clovis and 15,070 ±70 B. P. for the white pine. This would strongly indicate site use somewhere in the >11,000 to 15,000 B. P. range.

In summary, natural forces and downdrift of later artifacts could be an explanation for the early (core blade) tradition postulated for Cactus Hill. Since no other identical early assemblages have been reported, the burden of proof rests with the investigators of the Cactus Hill Site. Certainly, more work (and more sites) would be needed to confirm the existence of a human presence in this time period in southeastern Virginia.

The Fluted Point Makers

Clearly the most definite early use of the Cactus Hill Site was by traditions of the fluted projectile point makers. One group, apparently the makers of Clovis-like fluted points occupied Cactus Hill approximately 10,920 B. P. The Clovis hunters made more identifiable use of the site than the postulated earlier group, and they left examples of their fine stone work at a number of locations on the ridge at area B. The primary evidence of their presence is their tool kit, which upon this site was represented by fluted projectile points, side scrapers, end scrapers, edge worked flakes, gravers, and blade tools. As with most of the earlier people, the Clovis people preferred the center of the ridge above the low wet bottomland to the south of the site. Small working/living surfaces, generally less than 100 square feet, contained a few tools and flakes from tool sharpening and discard or breakage. Those tools were typically worn-out reject stage projectile points, broken scrapers, edged flakes, and thin flakes from soft percussion biface reduction. Only one hearth which was sufficiently protected and isolated to allow dating produced an acceptable date for this episode of occupation of the site. That date, 10,920 ±250 B. P. was obtained on a shallow surface-like scatter of a hard, glassy southern pine charcoal which could be no further identified as to species.

The Clovis occupation at Cactus Hill as represented by use areas and artifact clusters was typical of the other identified Clovis occupations on the Nottoway River (McAvoy 1992). These sites are on eolian sand hill caps, generally with southern exposures, and above swamps or low islands. The ratio of projectile points to end scrapers and other tools is higher on the Nottoway River sites than typically observed at base camps such as the Williamson Site where activities other than hunting

were of major concern. The Clovis tool kit at Cactus Hill seems to reflect only hunting and repair of tools and equipment. Little attention seems to have been given to preparation of animal products, quarry activity or initial tool production; at least this is the case in those areas excavated as of 1995. We only have faint and indirect evidence of what was being hunted by the fluted point makers at Cactus Hill. One small, quarter-size bone fragment from the dated hearth has been identified only as representing a large mammal. Indirect, residual protein tests suggest, that bison, elk, deer, and rabbit were hunted, but such test methods and results recently have been questioned as to accuracy and reproducibility. The debate continues as to the significance and accuracy of these tests.

Based upon stone materials and projectile point design it is speculated that the fluted point makers occupied Cactus Hill in (or though) two time periods. The earliest period (about 10,900 to 11,000 B.P.) is represented by four Clovis-like points of local chert and quartz. A second, probably later, group using a projectile point with a deeper basal concavity, and longer (?) flutes employed more exotic stone materials not locally available. These points are somewhat similar to examples from northeastern North America dated to approximately 10,600 B.P. There is no difference in the size of tool clusters, or use areas, based upon fluted point type. It is speculated that in both fluted point periods the site was occupied by small hunting groups of a few individuals, for short duration, and upon several occasions. They left few artifacts and probably returned to a central base camp (?), such as the Conover Site seven miles to the west, or the Williamson Site 12 miles to the northwest, for most new tool production. Also, the game killed near this site could have been butchered here, but may have been processed at a hunting related base camp with the assistance of other individuals.

There is no doubt that the fluted point makers occupied Cactus Hill, nor is there any significant disagreement as to the general time period, in radiocarbon years, of their presence. We have less positive evidence of two separate episodes of occupation, as area B of the site built so slowly that the postulated 200 to 700 (?) years of, or between, fluted point maker occupations demonstrate no stratigraphic build or change. We do have two traditions present based upon differences in projectile point style and preferred lithics.

Clovis-like points, and the tools associated with the hearth dating 10,920 ±250 B. P., are made of Williamson chert, Mitchell chert, and white quartz. A single artifact, probably the tip of a Clovis point is made of an unknown weathered green metavolcanic material which could be local. Other artifacts including end scrapers, gravers and edged flakes were of fossiliferous gray chert, fibrous chert, and weathering amber chalcedony. These are materials common in local clusters of Clovis artifacts from the Williamson Site, Greensville County Site, and the Conover Site (McAvoy 1992). The known range of these lithics is approximately 70 miles north-to-south and 40 miles east-to-west. This is in good agreement with the settlement pattern postulated for the local Clovis culture (McAvoy 1992).

None of the deep concave base points was made of lithics common to the Nottoway drainage. These lithics were highly silicified black rhyolite or tuff, glassy gray-black streaked rhyolite or highly silicified rhyolite, orthoquartzite or oolitic quartzite, clear crystal quartz, and an unknown type of weathering jasper. The known range of availability of some of these lithics is from 70 miles to the southeast to 150 miles to the southwest, but the source or range of other lithics is unknown, and may be to the north. These artifacts cannot currently be placed within any known or postulated settlement pattern for a Middle Paleoindian tradition, but the distance of movement may be more than 150 miles.

The use of the Cactus Hill Site by these people seems to have been restricted completely to the single ridge above the wet bottomland to the south of the site. Their use areas were small and are scattered over a distance of about 300 feet. The archaeological record indicates visits of short duration by small groups. These people probably regarded the Cactus Hill Site no differently than any other of the seven or so hunting sites they used over a distance of 10 miles in this area of the Nottoway (McAvoy 1992).

The Late Paleoindian and Very Early Archaic Periods

The Late Paleoindian and very Early Archaic periods are not represented on the Cactus Hill Site by well defined features or radiocarbon dates, but these periods are represented by a few artifacts. Four

projectile points of the Hardaway Side-Notched type (Coe 1964) were recovered on the ridge in area B and at area A of the site. Associated artifacts included an unnotched steeply pointed triangular biface, end scrapers, and a side scraper. Lithic materials were a layered chert-like material, silicified wood, and two points were made of dark rhyolite or siliceous tuff. These points were assumed by Coe to post-date Dalton and pre-date Palmer which would position them approximately after 10,400 B.P. but before approximately 9,500 B.P. The two points recovered in area B on the ridge top were found about 20 feet apart in the area producing Clovis and Palmer material. The two points found in area A were separated by approximately 80 feet, but were found on the ridge just above the slope to the swampy bottomland. Only the one point found by Johnson in the 1993 excavation of area A was recovered in a stratified context, and the reader is referred to Johnson's Appendix G in this work for any further discussion of possible associations with this artifact.

Six examples were recovered by NRS of large, deeply corner notched, concave, straight, or convex base projectile points similar to Benthal's point from level J at Daugherty's Cave (9,850 ±400 B. P.) and Broyles point from level 36 at St. Albans (9,900 ±500 B. P.). Benthal (1979) referred to his point as a Charleston Corner-Notched type, based on Broyles (1971) earlier description of points from the St. Albans Site.

All six of the Cactus Hill points were found by NRS in controlled excavations. Two of the points were found in area D of the site at the deepest level of a test square in the stratified deposit (45 to 50 inches below the surface). These artifacts are presumably among the earliest excavated in area D of the site, and based upon other artifacts found here they probably date earlier than 9,300 B.P. One point was excavated in 1990 by NRS in a stratified context in area A of the site several levels below a Fort Nottoway point. The Fort Nottoway type dated 8,800 B.P. on this site. Again, the position of this point in area A, well below the Fort Nottoway point, would suggest an age similar to those reported by Benthal and Broyles. The last three points were recovered in excavations in area B of the site. The stratigraphic context in which these points were recovered was considered disturbed or mixed with other Archaic age materials.

Three of the six points are made of very fine grain quartzite, a fourth is a good quality yellow-brown jasper and two are metavolcanics. These artifacts appear to be associated with end scrapers, side scrapers, edge worked flakes, and thin, well made, large triangular quartzite bifaces. Hearths are amorphous, of uncertain size, and placed on the surface with no association of rock or any lithic structural elements. An estimate of the age of these artifacts is 9,400 to 9,900 B.P. It is very interesting that artifacts typically recognized as Early Archaic corner notched types which are thought to be older than 9,400 radiocarbon years are very rare on Cactus Hill. This observation is consistent with Chapman's (1977) findings on the Little Tennessee River where the oldest 14C dates for Early Archaic Corner Notched projectile points were approximately 9,400 to 9,500 B.P.

The range represented by the lithics of the Hardaway Side-Notched artifacts is about 80 to 150 miles from the southeast and southwest. Points of this type, of similar materials, have been reported along the Meherrin and Chowan rivers to the southeast into North Carolina, and along the Meherrin and Roanoke rivers to the southwest into Brunswick and Mecklenburg counties. They are much more common into the North Carolina Piedmont, but fairly rare 50 miles above the Virginia-North Carolina line. The Nottoway River in eastern Virginia appears to represent the most northeastern extent of the general range of this tradition. Examples of Hardaway Side-Notched points are rarely reported to the north into Maryland. A settlement range of the Hardaway Side-Notched point tradition, based upon lithics seen in this area of the Nottoway River, is about 200 miles east-to-west by 100 miles north-to-south. No Hardaway Side-Notched point, made of common Nottoway River quartzite, has ever been reported from this area. Their use of this area can be described as transient and infrequent.

The range represented by lithics of the early deep notched Palmer-like points is more difficult to estimate. Many of these points appear to be made from the fine grain local quartzites, but others are made of jasper or the metavolcanics. These people appear to have been using the local materials while the Hardaway tradition generally shunned local materials, particularly quartzite. A larger data base for this point type will be needed for comparison

with small Palmer points to determine if there are significant differences. There is still no clear evidence that this point type is older than some of the small Palmer points. The small Palmer points were the deepest excavated upon the Slade Site three miles upriver (Egloff and McAvoy 1990).

The Early Archaic Period

The Early Archaic period at Cactus Hill is represented by a sequence of projectile points and tools, use areas, and features. From work on several excavations from 1990 through 1994 in areas A, B, C, and D on the site, an Early Archaic sequence was defined and refined. The sequence may start before 9,400 B. P. with small Palmer Corner-Notched points. The smallest points were succeeded on Cactus Hill by rarer, slightly larger forms which possibly should be called Kirk Corner-Notched. The entire Palmer sequence seems to range from >9,400 B.P. to 9,000 B.P. The sequence overlaps with the Decatur point (often called Angelico in Virginia) which can be defined as a separate type before 9,100 B.P. A maximum age range for Decatur would be approximately 9,250 to 8,950 B.P. These points are closely followed by Fort Nottoway Side-Notched points dating approximately 8,900 to 8,800 B.P. with a probable time range of 8,950 to 8,750 B.P.

In the same time period of approximately 9,300 to 8,750 B.P., occasional unusual "foreign" forms are encountered which would be recognized as similar to Plevna, Thebes, or Big Sandy points. Some of the rare forms are made of atypical stone materials for Decatur or Fort Nottoway, and probably truly represent rare intrusive cultural elements. From the dates for Fort Nottoway points on Cactus Hill, it is clear that an overlap exists with the dates quoted by other researchers for Kirk stemmed points and St. Albans bifurcated base points. In area B of the site a single hearth area produced six discarded Fort Nottoway points and two St. Albans points. It seems likely that these cultures, with quite different projectile point styles and other different tool types, may have coexisted for some period before the material culture of the bifurcated point tradition replaced the material elements of the Fort Nottoway tradition. By late in the Early Archaic (LeCroy bifurcate time, 8,300 B.P.), no corner notched or side notched forms seem to have been in use in this area on the Nottoway.

The onset of the Early Archaic tradition use of Cactus Hill is quite obvious, and definable, in the archaeological record at approximately 9,300 to 9,500 B. P. There was a very limited use of the site, primarily in areas A and B on the ridge, before this time, but after this time site use was extensive. The quartzite cobbles became a primary resource in this period, with heavy accumulations of debitage from the quarry activity of some traditions. Still, until approximately 8,900 B. P., it is difficult to clearly define any structure or symmetry to site use. The use areas for Palmer and Decatur traditions appear as rather irregular tool clusters and not centered around hearths or associated with other cross-connected tool clusters. The nature of site use changed with the Fort Nottoway tradition, ca. 8,750 to 8,950 B. P. The excavated data indicate central hearths and pits, probably in house structures, with closely connected tool clusters. Cross-mends of artifacts from different tool clusters suggest simultaneous use of features spread over several hundred square feet. There is a strong appearance of a residential base camp to the size and symmetry of these Fort Nottoway features, and this appearance is further supported by the quantity of associated debitage.

The lithic choices for diagnostic artifacts of the Early Archaic traditions is presented in the projectile point charts of Appendix A. Palmer points were manufactured of local quartzites and the Fall Line cherts and jaspers generally available within 15 to 25 miles. Decatur points were manufactured from local quartzites, and many were made of the metavolcanics of the slate belt regions of Virginia and North Carolina 70 miles to the southwest or possibly from cobbles collected on rivers to the south or southeast. Fort Nottoway points, however, were manufactured almost exclusively from the local quartzites.

Other sites where Fort Nottoway points have been observed in collections (by NRS), from the Fall Line above Richmond 60 miles northwest, to the City of Virginia Beach 70 miles to the east, to Gates County, North Carolina 50 miles southeast, all seem to produce points of the glassy Nottoway River quartzites. Some of the Gates County, North Carolina points were of the metavolcanic materials. A concentration of Fort Nottoway points in Mecklenburg County, Virginia (from the Arthur Robertson collection) 70 miles to the southwest on the Roanoke (which, like the Nottoway-Chowan drainage, empties into the Albemarle Sound in North Carolina) was observed to be predominately of the

metavolcanics and quartz with only a few quartzite points.

This "local" concentration of Fort Nottoway points seems to be bounded within an area 130 miles from east-to-west by approximately 110 miles north-to-south. This is from above the James River to the north, to below the Virginia/North Carolina Line near Albemarle Sound to the south. From east-to-west the spread is from Virginia Beach to Halifax County, Virginia. There may have existed two major quarry areas, one for quartzite upon the Nottoway to the north, and the other for metavolcanics in the volcanic slate belt region in Mecklenburg and Halifax counties to the southwest. One macroband of the Fort Nottoway tradition may have existed in this area, made up of several smaller microbands of these people.

An almost identical grouping of concentrations is observed for the Decatur tradition, with Decatur points often occurring on the same sites as Fort Nottoway points. The Decatur tradition may have just preceded, and was directly related to, the Fort Nottoway tradition. These two groups could likely represent an Early Archaic Coastal Plain continuum, similar to, and to some extent concurrent with, the Palmer/Kirk Corner-Notched continuum in the Piedmont of Virginia and North Carolina. Decatur points are known from areas in Alabama, Tennessee, North Carolina, Virginia, and north into Delaware. Although possibly occurring in "cluster" areas, the range of this point type is rather wide, but generally undated.

The Latter Period of the Early Archaic, and the Early Middle Archaic

Among the most interesting periods throughout the Archaic period in southeastern Virginia is from late in the Early Archaic to early in the Middle Archaic. This is the time span from approximately 8,600 (±) B. P. to 7,600 B. P. and represents the traditions using bifurcated base and stemmed projectile points/hafted bifaces with pronounced blade edge serrations. The accepted sequence for this period as defined by Broyles (1971), and Chapman (1977), is St. Albans bifurcated followed by LeCroy bifurcated followed by Kanawha, and then Kirk Serrated (Coe 1964). This is a general sequence, however, and variations are observed on the Nottoway.

While three of these traditions are well represented on the local Nottoway River sites, their artifacts have been observed to be far more numerous on some sites in the swampy headwaters of the Blackwater River (Blackwater Swamp) 20 miles to the north.

The earliest bifurcated base points are much like St. Albans points defined by Broyles (1971), and appear to be of similar age to the Fort Nottoway points. The lithic assemblage of the early bifurcate (St. Albans) tradition is significantly different from the Fort Nottoway assemblage, however, as it contains the first ground stone tools and there is a decrease in the use of some unifacial edged forms. Use areas of the St. Albans groups in area B and D at Cactus Hill are small by comparison with other groups, and there are fewer artifacts. At least 72.2% of the diagnostic artifacts recovered here associated with St. Albans are of lithics foreign to this area and were probably made 50 to 100 miles to the west or southwest of Cactus Hill. The St. Albans points in southeastern Virginia are generally more common and occur over much wider areas than do Fort Nottoway points. Viewed only from the perspective of the Cactus Hill Site, Fort Nottoway tradition site use was widespread and as a base camp, while St. Albans site use was spotty, light, and appears quite transient. A cremated burial recovered on the Slade Site in the mid 1980s contained St. Albans period artifacts including a fire damaged flaked adz blade with a highly ground cutting bit. This tool was similar to two recovered on Cactus Hill in St. Albans period contexts, although burials have not been clearly recognized on Cactus Hill.

Generally, the St. Albans period artifacts appear to have originated over a very wide area in southeastern and south-central Virginia and North Carolina. The most common lithics seem to be bounded by a distance east-to-west of 100 to 150 miles and north-to-south of 100 to 125 miles. The St. Albans use of foreign lithics rivals that observed with the Middle Paleoindian (?) fluted point makers, and their area of settlement, or range, may have been as large. It appears from the excavated data that Cactus Hill was employed as a quartzite quarry by the St. Albans groups for the replenishment of tools and as a small hunting camp.

LeCroy tradition use of Cactus Hill was not

nearly as extensive as the earlier St. Albans period use. It is assumed that the date for LeCroy of 8,300 ±110 B. P. on the Slade Site, three miles up river, is accurate as well for LeCroy use of Cactus Hill. Associated with the few LeCroy features (recovered over a wide area in the sand pit walls) on Cactus Hill were small slab anvils/mortars, manos, hammerstones, pitted (nutting) stones, and carbonized hickory nut shell. Distinct unifacial edged tools are rare. Most projectile points were made of local river cobble quartz, but other local materials such as quartzite were seldom used. A few points were recovered of non-local green silicified slate (silicified sediment or tuff) common 70 miles to the southwest. A quartz bipolar cobble quarry industry can be recognized as associated with the LeCroy tradition use of Cactus Hill. Also, there was extensive exploitation of hickory nuts as a food resource. A few fragments of ground and polished stone artifacts, perhaps adz or celt blades or bannerstones, have been recovered on the Slade Site with LeCroy features, but no similar associations were observed on Cactus Hill.

The general range of lithics associated with LeCroy on Cactus Hill varies from local (quartz) to a distance of perhaps 50 to 70 miles south and southwest (silicified slates/tuff). Non-local lithics are rare, however, and site-wide represent less than 15% of the projectile point total. A smaller settlement area, or range, is suggested by the LeCroy assemblage than was postulated for the St. Albans tradition. With LeCroy there was a major change in the artifact assemblage, from the typical Early Archaic bifacial and unifacial tools, to bifaces, hammers, anvils, and pitted "nutting" stones. These formal tools reflected a greater diversity in exploitation of food resources. On the Nottoway River, LeCroy is defined as the transition between the Early Archaic and Middle Archaic periods.

Several hundred years later than the LeCroy tradition, Kirk Serrated (Coe 1964) projectile points/hafted bifaces were in use on the Nottoway including Cactus Hill. The type appears to have been dated by Blanton and Pullins (1994) on the lower Nottoway drainage at approximately 7,800 to 7,600 B. P.

Of the 33 examples recovered in areas B and D of Cactus Hill (see Appendix A) approximately 27% were made of volcanic and metavolcanic materials. A few were made of striped coarse grain rhyolite of only moderate quality. These lithics are typical of materials from the Piedmont of North Carolina 70 to 150 miles to the southwest. The settlement area, or range, associated with this tradition seems similar in size to that associated with the St. Albans tradition 500 to 1,000 years earlier.

Other artifacts associated with Kirk Serrated on Cactus Hill include pitted "nutting" stones, hammerstones, and edged flakes. There is one fairly good association of Kirk Serrated with notched cobble net sinkers which was one of the few indications of fishing in the Archaic period recovered in the archaeological record on Cactus Hill. This is interesting, because Chapman (1979) reported net sinkers with Kirk Serrated points on the Howard Site on the Little Tennessee River. Chapman also reported an association with rectangular bannerstones, but none of this type has been recovered on Cactus Hill.

Kirk Serrated points are common on the Nottoway River, and throughout eastern Virginia into Maryland. These points are extremely numerous across the Piedmont of North Carolina.

The Middle Archaic Period

The generally acknowledged traditions of the Middle Archaic, Stanly, Morrow Mountain I, Morrow Mountain II, Guilford, and Halifax utilized Cactus Hill. Of the 543 projectile points recorded from major excavations in area B, 272 or 50% were from the traditions of this period of ca. 7,400 B. P. to ca. 5,000 B. P. This contrasts with the 22.86% of the total time of Native American occupations of the site that this period represents (based upon an assumed time of 10,500 years). The number breakdown by tradition of diagnostics is: Stanly, 12; Morrow Mountain I, 33; Morrow Mountain II, 107; Guilford, 84; and Halifax, 36. As compared to numbers of diagnostics produced by all traditions, Morrow Mountain II and Guilford clearly rank as the largest and second largest respectively, while Halifax and Morrow Mountain I marginally rank as the third and fourth largest.

In terms of preferred lithics, there is a fairly large variation among the traditions of the Middle Archaic period. Local quartzite and quartz, available at Cactus Hill, was preferred for 67% of the Stanly

points, 48% of Morrow Mountain I points, 91% of Morrow Mountain II, 83% of Guilford, and for 100% of the Halifax points. These numbers, however, are somewhat misleading as most of the Middle Archaic points not made of local quartzite and quartz were made of other lithics available within 25 miles of the Cactus Hill Site. By contrast, the non-local lithic sources for many of the traditions of the Early Archaic and early within the Middle Archaic were in the range of 50 to 100 or more miles from this site.

Except for Stanly tradition use of Cactus Hill, The Middle Archaic traditions heavily occupied area B, on the ridge, and there was variable use of area D to the north. Individual use areas for Morrow Mountain I, Morrow Mountain II, and Halifax in area B are fairly large, although the Guilford use areas appear smaller and more isolated. Very extensive use of the Cactus Hill Site appears to coincide with Morrow Mountain II at approximately 6,500 B. P. This observation holds true for many of the other sites in this area of the Nottoway River drainage, and a higher population density is suggested for this period.

The lithic cultural remains of this period are fairly diverse. Most of the delicately made unifacial tool forms of the Early Archaic period had disappeared and were replaced by bifacial tools. Other tools include hammerstones, slab mortars, manos, bipolar cores, wedges, and irregularly shaped unifacial and bifacial edged flakes. Chipped celts and adz blades with ground cutting bits appear to have continued in use from late in the Early Archaic, and flaked notched axes appear first on Cactus Hill with the Morrow Mountain II or Guilford traditions. Bannerstones (atlatl weights) are present but very rare.

Fire pits and hearth features became larger in the Middle Archaic period, and some very large and deep pits appear at Halifax time. A storage function may have been some part of the life cycle of the pit features, and associated floral remains suggest multi-seasonal use. Many of the hearth/pit features from this period contain large quantities of carbonized hickory nut shell as well as hickory and oak charcoal. A higher percentage of Middle Archaic hearths contain larger quantities of hickory nut shell than do Early Archaic hearths. This may indicate a significant increase in the importance of the role of gathering plant foods, fruits and seeds.

The overall picture on Cactus Hill of the Middle Archaic, at least from the Morrow Mountain I period through the Halifax period, is one of decreased territory or range and increased use of local lithics and plant foods. Longer stays at Cactus Hill are indicated by feature contents, and the large size of use areas and large number of features in these use areas may suggest an increase in population.

The Late Archaic Period

Late Archaic period use of Cactus Hill was minimal in area D of the site. In area B, several rather large areas contain Late Archaic period artifacts. The point types included in this period with the assumed temporal placement are: Perkiomen, ca. 3,500 B. P. to ca. 4,000 B. P.; Island Swamp, ca. 3,000 B. P. to ca. 3,900 B. P.; small stemmed, ca. 3,500 B. P.; Savannah River wide blade and narrow blade, ca. 3,800 B. P. to ca. 4,200 B. P.; Bare Island, ca. 4,000 B. P. to ca. 4,300 B. P.; Slade, ca. 3,500 B. P. to ca. 4,500 B. P.; and Lamoka-like, ca. 4,500 B. P.

The Savannah River types, small stemmed, Bare Island, and Slade were fairly numerous (total of 95 diagnostics), but the total numbers of the other point types were minimal (5). As there was little identifiable site use during the Late Archaic period in area D, only a few conclusions can be drawn concerning Late Archaic site use from the area B data. Generally, Late Archaic use of Cactus Hill was on the ridge over the wetland in areas A and B. Use areas are variable from small for some diagnostic types to fairly large for others, and many of these areas overlap. Use areas contain large concentrations of hearth stones, and while few large continuous hearth areas could be recognized, there were a number of circular FCR hearths averaging about 24 inches in diameter. Some of these features contained fire damaged Late Archaic projectile points, so the association is valid. The use of Cactus Hill by these groups appears to have been as a quarry site and occasional hunting camp not as a large (residential) settlement.

The choice of local quartzite and quartz lithic materials by tradition was: small stemmed, 86% local materials; Savannah River wide blade, 100%; Savannah River narrow blade, 100%; Bare Island, 95%; and Slade 100% local materials. It is obvious that the major traditions of the Late Archaic on

Cactus Hill were quite satisfied with locally available lithics. There are no indications in the lithic record, of foreign lithics or trade items associated with this period. Only bifaces are commonly found representing the Late Archaic. A few fragments were recovered of thin well made steatite bowls, and two steatite net sinkers, but these items were likely associated with the transitional Late Archaic Perkiomen tradition. Similar items have been recovered upon three other sites in the area in clear association with Perkiomen points/hafted bifaces.

The Woodland Period and Historic Period

These periods are discussed entirely in Appendix B for areas D and B of the Cactus Hill Site. Also, Johnson recovered some Woodland and Historic material, see Appendix G.

Table 7.1. DIAGNOSTIC ARTIFACT SUMMARY, EXCAVATION AREA B, CACTUS HILL 44SX202, NRS

Estimated Total Years Represented by Artifact Cluster	Diagnostic Chipped Stone Artifact Cluster (1,885 sq. ft. excavated)	Artifact Totals (543)	Percentage of Local Qte and Qu	Intensity of Site Use (Cluster Diagnostics) in Area Excavated (Artifact Total/Century#/100 sq. ft.)	Time Span, (Percentage of Total Time 1,000 B. P. to 11,100 B. P.)
2,000 (from 1,000 B. P. to 3,000 B. P.)	Large triangle, thin side notched, tapered stem, fish tail total	1 1 1 1 4	100% (cluster)	0.011	19.8%
700 (from 3,000 B. P. to 3,700 B. P.)	Perkiomen-like Island Swamp Small stem total	1 2 21 24	100% 100% 86%	0.180	6.9%
800 (from 3,700 B. P. to 4,500 B. P.)	Savannah River(wide) Savannah River (narrow) Bare Island Slade total	15 24 22 13 74	100% 100% 95% 100%	0.493	7.9%
1,000 (from 4,500 B. P. to 5,500 B. P.)	Lamoka-like Halifax Rowan total	2 36 11 49	100% 100% 100%	0.260	9.9%
700 (from 5,500 B. P. to 6,200 B. P.)	Guilford total	84 84	83%	0.637	6.9%
600 (from 6,200 B. P. to 6,800 B. P.)	Morrow Mt. II total	107 107	91%	0.944	5.9%
300 (from 6,800 B. P. to 7,100 B. P.)	Morrow Mt. I total	33 33	48%	0.584	3.0%
500 (from 7,100 B. P. to 7,600 B. P.)	Stanly Small Stanly-like total	9 3 12	67% 100%	0.127	5.0%
600 (from 7,600 B. P. to 8,200 B. P.)	Kirk Serrated Sharps Mill Kirk Serrated Kanawha-like total	19 3 3 25	74% 0% 100%	0.221	5.9%
200 (from 8,200 B. P. to 8,400 B. P.)	LeCroy total	9 9	78%	0.239	2.0%
400 (from 8,400 B. P. to 8,800 B. P.)	St. Albans and large St. Albans total	18 18	22%	0.239	4.0%
200 (from 8,800 B. P. to 9,000 B. P.)	Kirk Stemmed Kirk Side-notched Fort Nottoway total	10 2 32 44	90% 100% 97%	1.17	2.0%

Table 7.1. DIAGNOSTIC ARTIFACT SUMMARY, EXCAVATION AREA B, CACTUS HILL 44SX202, NRS

Estimated Total Years Represented by Artifact Cluster	Diagnostic Chipped Stone Artifact Cluster (1,885 sq. ft. excavated)	Artifact Totals (543)	Percentage of Local Qte and Qu	Intensity of Site Use (Cluster Diagnostics) in Area Excavated (Artifact Total/Century#/100 sq. ft.)	Time Span, (Percentage of Total Time 1,000 B. P. to 11,100 B. P.)
200 (from 9,000 B. P. to 9,200 B. P.)	Decatur	9	44%	0.239	2.0%
	total	9			
750 (from 8,750 B. P. to 9,500 B. P.)	Kirk Corner-Notched	15	53%	0.276	7.4%
	Palmer Corner-Notched	24	70%		
	total	39			
500 (from 9,500 B. P. to 10,000 B. P.)	Deep Notched Palmer or Kirk like - very early (?)	3	0%	0.032	5.0%
	total	3			
400 (from 10,000 B. P. to 10,400 B. P.)	Hardaway Side-Notched	1	0%	0.040	4.0%
	Dalton-like (?)	2	50%		
	total	3			
700 (from 10,400 B. P. to 11,100 B. P.)	Middle Paleoindian (?)	3	25%	0.030	6.9%
	Clovis	1	(cluster)		
	total	4			
4,000 (from 11,000 B. P. to 15,000 B. P.?)	Early triangular or Hardaway Blade-like bifaces (?)	2	0%	0.003	N/A
	total	2			

Notes: Qte=quartzite; Qu=quartz

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ADDENDUM:

Excavation of the Cactus Hill Site, 44SX202, Area A-B, Spring 1996

Summary Report of Activities and Findings

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Nottoway River Survey

Introduction

The remaining unexcavated area of the south ridge of the Cactus Hill Site, designated area A-B, Figures 1 and 2, was investigated by Nottoway River Survey (NRS) between March 28 and July 5, 1996. This work was supported in part by the Virginia Department of Historic Resources, through the Threatened Sites Program, and by NRS volunteers.

The area investigated, which totaled approximately 1,400 square feet, was between McAvoy's 1993 work area B and Johnson's 1993 work area A. To briefly review, area B was located to the south and west of the sand pit over a wetland and was a ridge composed of a medium to fine sand with lamellar silt bands. Area B contained cultural deposits to a depth of 27 to 30 inches below the surface. This very heavily utilized area of the site revealed artifacts from early eighteenth century age through Paleoindian age. Generally, only Middle Woodland, Early Archaic and Paleoindian occupation zones could be identified and separated, and even for these periods remaining areas of working surfaces were very small. Disturbances were attributed to a combination of cultural impact and microbioturbation.

In area A-B, excavated in 1996, approximately 150 feet to the east of area B, the soil was identical to that of area B. Cultural deposits were as deep as 37 inches below surface with a heavy concentration of Middle Archaic artifacts and features but a much lighter concentration of material of Early Archaic age.

The absence of significant Early Archaic use of area A-B resulted in much easier identification of the light concentration of Paleoindian artifacts and features in the lowest levels of this area of the site. In many excavation units in area A-B there was almost a sterile zone between Morrow Mountain and earlier Clovis occupations. Area A-B was riddled with looter's trenches and localized "pot holes". Approximately 400 square feet of the total area was found to have been looted and provided very little data. Over a period of three months, more than 2,000 volunteer man hours were spent on the excavation. Nottoway River Survey members accounted for approximately 1,400 of these hours, unaffiliated persons and ASV members for over 300 hours, and the Appalachian State University (ASU) field school, under Dr. Thomas Whyte, added over 250 hours to the project.

Figures 3 through 5 show various excavation units under investigation by volunteers in the spring 1996 work on Cactus Hill. Figure 3 shows the typical manner in which the upper levels of the eastern block of units in area A-B were excavated. Hand troweling of most of the upper levels of the undisturbed deposit resulted in recovery of many *in situ* Late Archaic features such as the hearths and mortar shown in the figure. Also recovered in the features were calcined bone and carbonized plant remains. Figure 4 shows recovery of core blades by volunteers working deep in lower levels of units W165N105 and W110N100 in area A-B. All recovery work in the deepest levels of the site was by hand troweling, and in most units soil samples at this level were fine screened and/or processed by flotation to recover fine carbon particles for 14C dating. As shown in Figure 5, many excavation units in the eastern and western blocks of units were under investigation simultaneously. Excavation progression into the deposit, and observed cultural stratigraphy, were recorded by use of transit and rod in all levels of all units. Field school activities, as shown in Figure 5, encompassed many archaeological techniques.

During the 1996 field work the project site was visited by several well known students of early man in North America including C. Vance Haynes and Dennis Stanford, Figure 6. Dr. Haynes took extensive notes on the project and carbon samples from an older area of the site for study at the University of Arizona. Representatives of the property owner, Union Camp Corporation, visited the site on several occasions to witness the work, and they were most cooperative. We greatly appreciate the assistance of Mr. Steve Jones, Union Camp's district forester, during the 1996 excavations.

Findings

One major accomplishment of the 1996 field season was the discovery of an area of Clovis quarry activity where local quartzite cobbles were being made into fluted points. No quarry activity had been observed in the previous excavations of Clovis working surfaces. Ten broken/rejected in-process quartzite Clovis points were recovered over a distance of 80 feet along the ridge top. Intermixed with the points and quartzite debitage were a few discarded tools and debitage of Williamson chert, Mitchell chert, and some exotic non-local materials. Also, two "classic" Clovis tools were found of quartzite which indicated that this material was occasionally used for more than just projectile points.

Among the broken quartzite Clovis preforms was discarded a Clovis preform of Williamson chert. This artifact, which apparently was made upon the Williamson Site 12 miles to the west on the Little Cattail Creek, appears to have been discarded at Cactus Hill as larger quartzite preforms were made. The presence of the nearly completed Williamson chert point clearly indicated that one product of the Williamson quarry was unfinished points or preforms which were carried away from that site to be completed at a later time as needed. Williamson chert preforms are occasionally recovered as surface finds on local Clovis camp sites away from the Williamson site (McAvoy 1992). This further supports the conclusions drawn for the Williamson chert preform found upon Cactus Hill.

Most of the Clovis artifacts from the spring 1996 work on Cactus Hill are shown in Figures 7, 8, and 9. No completed Clovis points were found in the 1996 excavations, and it was concluded that area A-B was used primarily for quarry work and other manufacturing activities. The working surfaces containing most of the finer tools, completed fluted points, and hearth features were closer to the river in area B of the site which was excavated in 1993 and 1994.

The primary purpose for the additional salvage work at Cactus Hill in the 1996 field season was to determine if a pre-Clovis component could be confirmed on this site. In several excavation units where there was a clear Clovis presence there also was an indication of site use before Clovis. From the 1993/94 work on Cactus Hill it was observed that below the fluted point horizon on the site there was a very strong indication of site use by an even older tradition. In area B, NRS recovered blade cores and core blades in a variety of sizes as well as two small trianguloid bifaces. These artifacts, which were recovered below Clovis levels, were identical to artifacts recovered in 1985 in a surface collection on the Baskerville site 13 miles upriver from Cactus Hill. The Baskerville Site artifacts were recovered on a high sandy clay ridge adjacent to a flood chute swamp near the Nottoway River. Site topography was very similar to that observed on Cactus Hill, but the Baskerville cultural deposit was shallow and in the plow zone.

In area B of Cactus Hill one cluster of three blades was recognized in the 1993 work in unit 2/9 below a Clovis working surface. The core blades were in a single silt band with a scatter of white pine charcoal. This feature was initially identified as a possible Clovis hearth set about 3 inches below the Clovis level. Three lumps of charcoal from the feature (all identified as white pine) were 14C dated to 15,070±70 B.P. (see main Cactus Hill report - Chapter 5).

Several other excavation units in area B produced artifacts below the fluted point levels. Unit 2/7 produced a blade core, core blades, and a thin trianguloid biface fragment below chert, jasper, and chalcedony Clovis-like tools. The Clovis-like artifacts in this unit had been recovered below a level containing Early Archaic projectile points. Other blade cores, and blades, were recovered in area B below fluted points and tools in units 0/5, 2/11, and salvage excavation units B and C. However, the total number of such artifacts recovered below Clovis in the 1993 work was relatively small and no additional features could be recognized.

In the spring 1996 excavation, clusters containing core blades and blade cores again were recovered below Clovis-like artifacts, primarily chert trim flakes, Clovis unifacial tools, and broken Clovis preforms. One of two blade cores recovered in this work was in questionable context, but overall, the stratigraphic relationship between Clovis-like artifacts and clusters

of core blades was better in the 1996 work. The higher integrity of the deposit in area A-B was a result of less disturbance in this area of the site during the Archaic period.

Six blade clusters were recognized below Clovis levels in eleven excavation units (Figure 10). The units were maintained as small 5 by 5 foot squares to minimize the effect of any vertical distortion across the silt bands in the dune. Viewed in a broader perspective, only three individual cluster areas could be recognized.

The first cluster area discovered in the 1996 work was across three units from west 100 through west 110 at (approximately) north 100 (Figure 11). This cluster was contained in an area 10 feet east-to-west by at least 7 feet north-to-south and thus represented a minimum area of 70 square feet. A more precise estimate of the cluster area was not possible due to disturbances in adjacent units. Two levels of the cluster area contained core blades. The upper blade level, at approximately 28 to 30 inches below surface, contained small blades (Figures 12 and 13). A single cluster of 5 of these blades averaged 29 mm in length, 16 mm in width, and 3.6 mm in thickness (Table 1). All were quartzite. A lower level at approximately 30 to 33 inches below surface contained larger quartzite blades. A continuous cluster across two excavation units in this lower level contained 11 blades (Figures 12, 13, and 14) which averaged 22 mm in width, and 7.1 mm in thickness (Table 1). No average length could be determined due to the fractured nature of the blades. A single 14C date on partly pretreated carbonaceous soil below the largest core blade in unit W110N100 was 10,160±60 B.P. (Table 2), but this date should be viewed as a minimum age due to the lack of alkali pretreatment of the sample (very small size) to remove organic acids. The blade clusters in this area of the site were several inches below the Clovis level and separated by almost sterile sand and silt bands. Figure 15 shows a cross section of these units with notation of cultural stratigraphy.

The second cluster area was discovered in the four adjacent units W165N105, W170N105, W170N110, and W173N100 (Figure 16). Over this area, two adjacent blade clusters were recognized representing 9 quartzite core blades (Figures 17, 18, and 19) which were spread over an area of 50 to 60 square feet in units W165N105 and W170N105. These clusters were estimated to have been at an average depth of 32 inches below the surface and approximately four inches below the Clovis level. Both clusters were judged to be of the large blade variety with dimensions of length 66 mm and 40 mm, width 28.5 mm and 26 mm, and thickness 7.2 mm and 7.2 mm respectively (Table 1). The two blades found in units W170N110 and W173N100, which were some distance away from the main clusters, are not shown or used in the dimensional averages.

The cluster in unit W170N105 produced one 14C date of 9,250±70 B.P. (Table 2) on a dark stain of carbonaceous soil under a large blade-like flake. The carbonaceous soil date of 9,250 B.P. is considered to be much later than the age of the artifact cluster with which it was found. A Middle Archaic feature which was intrusive into the Clovis level (and below it) was observed to be about 1.5 feet to the south of the blade cluster. That feature contained carbonized hickory nut shell and wood, and it was evaluated as a Morrow Mountain I hearth. A carbon sample was collected and submitted for dating. The resulting date was 6,700±130 B.P. which is consistent with Chapman's age range for Morrow Mountain I (MM I) on the Howard site on the Little Tennessee River (Chapman 1979). While possibly representing the source of the "late" carbon contamination of the blade cluster, the MM I feature also is thought to have resulted in another closely related problem. The disturbed and pH modified soil in the MM I feature would have promoted root growth. Small microroots penetrating across the silt band over to the blade cluster would have found trapped residual moisture under the large flake, and this would have promoted the growth of a microroot matte. This is observed even now in some circumstances with Late Archaic rock hearths. As the roots deteriorated a series of small troughs, conduits for carbon from the MM I hearth, would have remained leading directly under the flake. The flake then would have acted to protect the root remains, carbon particles, etc., from downflow of surface water; thus the dark stain noted under the flake during excavation. What were thought to be carbonized but unburned root fragments were reported by C. Vance Haynes (personal communication 1996) from his initial inspection of part of the soil/carbon sample removed from under the artifact.

One soil sample from level 10 containing the blade cluster in unit W165N105 produced a hearth-like concentration of fine charcoal particles which was 14C dated to 16,670±730 B.P. (Table 2). From a review of the field data sheets it is noted that the carbon particles were collected by flotation primarily in one of three soil samples representing the 5 by 5 foot unit in a two inch thick level among the blade cluster. The other

two soil samples produced very little carbon (particles) which led to the conclusion that the carbon was localized. No definite hearth feature was identified, but the carbon particles were concentrated in approximately one third of the unit. Unit W165N105 was very clean by Cactus Hill standards. There was little Archaic period hearth activity in the unit, thus the common down drift problem seen at Cactus Hill above the blade level should have been minimized. Still this was a very small carbon sample, and after pretreatment (which normally removes approximately 80 percent of the sample weight) the laboratory counted the sample for approximately a week to produce a date. Since typical contamination problems in the Cactus Hill deposits result in later than expected dates, not earlier dates, the reported date at 2 sigma is thought to be reasonably accurate. The cross section of this blade cluster area is shown as Figure 20.

The third cluster area was recognized by NRS in adjacent units W160N95, W165N95, and W160N90 (Figure 21). This area of the excavation represented a convergence of the old silt banded dune profile with an apparently more recent sand fill (Figure 22). Here artifacts of Fort Nottoway, Clovis, and blade core age were intermixed over an area of approximately 75 square feet. Six blades (Figures 23 and 24) which were recovered in unit W160N95 ranged in width from 18 mm to 42 mm and in thickness from 4 mm to 13 mm (Table 1). The significance of the overall cluster area is unknown, and it may represent a mixture of artifacts from several time periods. Blades collected in unit W160N90 were badly intermixed with other cultural material and are not shown or considered in Table 1. The cross section of blade cluster area three is shown as Figure 25.

Based upon an analysis of the blade clusters recovered in the 1993 and the 1996 work, it is concluded that there was a period of occupation upon the Cactus Hill Site by groups using a blade core technology prior to use of the site by groups making fluted projectile points. Also, there is some evidence to suggest several periods of occupation by these early blade makers. Older horizons represented by large and intermediate size blades appear to be followed by a later horizon represented by small blades and trianguloid-to-lanceolate bifaces.

From the 1993 through 1996 work on Cactus Hill a summary of all artifact types found in all blade levels includes: blade cores, core blades, small flakes, trianguloid-to-lanceolate bifaces, edge modified and end modified blade flakes, edge damaged and edge worn blade flakes, and a flat slab sandstone abrader. No other artifact types have been recovered in the blade levels except very small trim flakes which may have drifted down into the blade levels from Clovis or Early Archaic levels. A review of the blade cluster patterning and dimensions suggests that individual clusters were no more than 100 square feet in area and separated by as little as 10 to 15 feet on the ridge center line in areas B and A-B. Blade clusters were encountered over a distance of approximately 300 feet on the ridge, and many of the areas producing core blades also produced Clovis artifacts in higher levels.

The results of 14C dating, combined with the stratigraphic data, suggest that the earliest occupation of the site was as early as 15,000 to 16,000 B.P. This temporal placement is highly consistent with the estimated time of earliest use of the Meadowcroft rock shelter in western Pennsylvania (Adovasio et al. 1978).

Other findings in the 1996 field season included fairly well separated Savannah River and Morrow Mountain occupations. While the Savannah River occupation of this area of the site was fairly light, the Morrow Mountain occupation was quite heavy. The Morrow Mountain occupation was recognized by numerous diagnostic bifaces, rows of hearths, and elongated shallow pits filled with debitage. A possible human cremation burial was represented by a calcined human tooth fragment recovered near an adz blade found under a Morrow Mountain working surface.

A continuum of Morrow Mountain occupation from typical Morrow Mountain I through Morrow Mountain II was recognized (and stratigraphically separate) in some excavation units. Changes in lithic choices and degree of artifact curation were evident across the Morrow Mountain traditions represented in area A-B of the site. The single date for a Morrow Mountain I hearth from area A-B, 6,700±130 B.P., compares at 1 sigma with the latest date for Morrow Mountain I obtained by Chapman (1979) on the Howard site in Tennessee. As more 14C dates are obtained across Virginia in the future for Morrow Mountain I, it will be interesting to see if a general time lag is maintained between the Virginia and Tennessee dates.

Compared to the normally observed Early Archaic usage of the south ridge of the Cactus Hill Site in area B, there was relatively little Early Archaic use of much of area A-B especially up-slope (north) around the west 150 to 160 units. This situation aided greatly in recognition of the Clovis quartzite quarry activity. Still, some Early Archaic activity was recognized

around the W100 to W115 units, and down-slope (south slope) in the W150 to W165 units. Early Archaic material encountered in discreet clusters included Decatur, Fort Nottoway, and bifurcate (LeCroy). One fragment of a Hardaway side-notched point was recovered which matched to a fragment of the same artifact found on the surface four years ago (1992) discarded in a looter's backfill. Archaic period artifacts from several of the excavation units from two areas of the 1996 excavation are shown as Figures 26 and 27 in the overall stratigraphic sequence as excavated.

Table 3 presents a typical analysis of recovered lithics in excavation units in the 1996 work on Cactus Hill. Two units are analyzed, one unit from an up-slope (higher) position and one unit from a down-slope (lower) position on the ridge. The up-slope position lithic weights in area A-B are observed to be equivalent to the largest values obtained in the excavations of area B (main report). Totals of approximately 300 pounds per 100 square feet appear common on the up-slope locations in area A-B. Down-slope totals were around 50 pounds per 100 square feet.

A more detailed analysis of the Archaic period use of area A-B on Cactus Hill is not considered necessary for this supplementary report due to the very detailed analyses previously made of the Archaic period use of areas D and B (Chapter 5 of the main report). All of the 1996 work was documented by excavation plans and forms kept level-by-level for each unit. Numerous slides and photographs also were taken as the work progressed. The artifacts and documentation from the 1996 field work at Cactus Hill are stored at the NRS facility in Sandston, Virginia.

Recommendations

This work completes the major excavations of the higher locations on the south ridge at Cactus Hill. Geological analysis of the dune formation mechanism(s) should continue throughout 1997, as should an analysis of the age of the dune which includes a search for geological carbon in the dune sands. This can be accomplished by excavating deeper in areas already excavated by NRS which produced blade clusters and which are bench marked with 14C dates. Almost none of the areas of higher elevation (which produced the blade clusters) remain for archaeological investigation. Most of the more productive areas have been destroyed by sand mining and looting. One small area to the extreme east on the ridge which was not looted was recently excavated by M. F. Johnson, with some success, but this location was slightly lower in elevation than most of the areas which have produced the heavy concentrations of early material.

Across the sand pit to the north of area A-B a major unexcavated, and unlooted, part of area D of the site (Figure 28) remains. This area dates ca 4,000 B. P. to ca 10,000 B.P., and it contains the best open site stratigraphy observed on the Nottoway River. An earlier test excavation in area D of the site to the extreme north of the primary artifact concentrations and close to the river revealed an apparent stratified woodland component. Artifacts of Late, Middle, and Early Woodland age were recovered in a stratified sequence with fluvial sands.

Throughout area D of the site there is excellent preservation in the dry, sandy soil of calcined faunal remains and carbonized wood and seeds to a microscopic level. The remaining area is approximately two acres. Union Camp has expressed an interest in preserving this area, and they have agreed not to remove sand or cut timber here while the archaeological project is ongoing. This area of the site has datable hearths possibly representing every group to use the site throughout the Woodland and Archaic periods, and in the opinion of NRS area D has excellent research potential and should be protected if possible.

Acknowledgments

The following Volunteers (of record) assisted with the 1996 NRS excavation of Cactus Hill:

Lynn McAvoy, James McAvoy, Tim Shelor, Bryan Warren, Andrew Madsen, Keith Egloff, George Ramsey, John Zaun, Jim Butler, Albert Pfeffer, William Thompson, Dick Helm, Benny New and family, David Rubis, Mike Johnson, Joyce Pearsall, Richard Diamond, C. N. Manson, Walter Witschey, Tom Whyte, Carli Adams, Charles Benton, Paul Hagen, Cricket Hefner, Sally Jones, Jason Mann, Chris Moore, Elizabeth Ott, R. V. Rikard, Robin Sarratt, Gary Smith, Dawn Suarez, Jill Warwick, and Mark Williams.

Note that all references in this addendum are as presented in the main report; and all drawings of artifacts in all figures are shown 80% natural size.

TABLE 1. CHARACTERISTICS OF BLADES BY CLUSTER, 1993 AND 1996 NRS EXCAVATIONS, CACTUS HILL

Blade Cluster	Site Area/ Unit #	Number of Blades/ Material	Length (Avg.) mm	Width (Avg.) mm	Thickness (Avg.) mm	% Edge Worked/ Damaged	% Edge Worn (used)	% With Cortex
(1993)	B 2/9	3/all qte.	43	19	5.8	100%	67%	33%
1	A-B W110N100 Level 10/11	6/all qte.	N/A	22	6.4	67%	50%	50%
1	A-B W105N100 Level 12	5 (plus 3 flakes)/all qte.	29	16	3.6	60%	40%	0%
1	A-B W105N100 Level 13	5/all qte.	N/A	22	7.8	80%	80%	20%
2	A-B W165N105 Level 10	6/all qte.	40	26	7.2	100%	83%	83%
2	A-B W170N105 Level 11	3 (plus 3 flakes)/all qte.	66	28	7.2	33%	100%	67%
3	A-B W160N95 Level 9	6/all qte., (plus 1 blade core)	49	27	7.2	67%	83%	50%

TABLE 2. BLADE LEVEL CARBON 14 DATE SUMMARY, 1993 AND 1996 NRS EXCAVATIONS, CACTUS HILL AREAS B AND A-B.

Area Unit/Level	Period	Feature	Carbon Source	Date (B.P.) / Laboratory #	Associated Artifacts
Area B 2/9 level 6 (1993)	Early Paleoindian (blades)	Blade cluster with hearth	Chunks of solid white pine charcoal	15,070±70 Beta-81590	Three core blades
Area A-B W110N100/ level 10/11 (1996)	Early Paleoindian (large blades)	Blade cluster with possible hearth	Carbonaceous soil - very fine carbon particles	10,160 ± 60 Beta-92923 (see note 1)	Six core blades
Area A-B W105N100 level 13 (1996)	Early Paleoindian (large blades)	Blade cluster continuation from unit W110N100	Carbonaceous soil	Sample rejected after initial pretreatment due to lack of carbon	Five core blades
Area A-B W165N105 level 10 (1996)	Early Paleoindian (large blades)	Blade cluster with association of fine carbon particles in 30% of unit area	Flotation sample of very fine carbon particles, possible hearth	16,670±730 Beta-97708	Six core blades
Area A-B W170N105 level 11 (1996)	Early Paleoindian (large blades)	Blade cluster with dark stain under a large flake in center of cluster	Directly excavated sample of carbonaceous soil and charcoal particles under large flake	9250±60 Beta-93899, sample apparently contaminated by hearth in W170N100	Three core blades, three small flakes
Area A-B W170N100 level 7 (1996)	Middle Archaic	Morrow Mountain I pit hearth, intrusive into Paleoindian levels and adjacent to blade cluster in W170N105, Lev. 11	Mechanically screened sample of carbonized wood and nut shell, chunks of charcoal; sample taken from level 7 above blade level	6700±130 Beta-98363	Morrow Mountain I projectile points, fire cracked rock

Note 1: Sample was incompletely pretreated (acid wash only). Due to very small size, sample was not given an alkali wash because of concern that the entire sample would dissolve.

TABLE 3. ARTIFACT TYPES, NUMBERS AND WEIGHTS FROM TWO TYPICAL EXCAVATION UNITS, 1996 NRS EXCAVATIONS, CACTUS HILL.

Unit/level	Total Weight lbs	FCR Weight lbs	Qte Flakes #/Weight lbs	Qu flakes #	Other Flakes #	Diagnostic Artifacts and Bifaces
(up-slope) W165N100						
1	N/A	N/A	N/A	N/A	N/A	heavily disturbed - discarded
2	5.5	3.0	578/1..8	16	2	2-Savannah River points, 2- bifaces
3	10.0	6.5	444/2..0	20	2	1-Morrow Mt. I, 2-bifaces
4	38.5	30.0	1321/5.9	53	22	1-Morrow Mountain II, 6-bifaces
5	17.5	10.5	1209/4..5	58	9	1-corner notched E.A. point, 2-bifaces
6	5.5	0.3	329/2..8	21	9	1-corner notched E.A point with bifurcated base, 3-bifaces
7	1.0	0	211/0.8	16	11	1-Fort Nottoway point, 1-Morrow Mountain I point in a pit bottom
8	0.75	0	107/0.6	7	15	1-Clovis biface (preform) tip - chert
9	0.1	0	12	1	1	small trim flakes only
10	0	0	0	0	0	sterile (blade level - no blades present this unit)
Totals (25 sq. ft..)	75.85	50.3	3002/18.4	192	71	8-diagnostic artifacts, 15-bifaces
(down-slope) W115N70						
1	2.0	1.2	65/0.5	6	0	Early and Middle Woodland pottery-cord marked
2	1.5	0.5	160/0.8	12	0	pottery-same as lev. 1 above, 1-side notched point, 4-bifaces
3	1.5	0.5	174/0.8	5	0	3-bifaces
4	12	5.5	746/5.0	8	10	2-Savannah River points (argillite), 3-bifaces
5	15	7.5	1099/4.5	42	23	4-bifaces
6	9	4	642/3.9	17	46	1-Morrow Mountain II point, 1-Morrow Mountain I point, 1-Decatur point (north end of excavation unit) 12-bifaces
7	4.5	0	391/1.8	7	51	1-Fort Nottoway point
8	3.0	0	445/2.0	22	56	1-Fort Nottoway point, 3-bifaces
9	3.0	0	217/0.8	12	41	2-bifaces
10	1.0	0	197/0.7	4	43	1-unifacial tool
11	0.1	0	12	2	13	small trim flakes only
Totals (100 sq. ft..)	52.6	19.2	4150/20.9	137	283	8-diagnostic artifacts, 31-bifaces

Figure 1. Area A-B of the Cactus Hill Site on the sand ridge, as seen looking west toward the Nottoway River. Top, March 1996 after removal of vegetation prior to excavation. Bottom, during the excavation in May 1996.

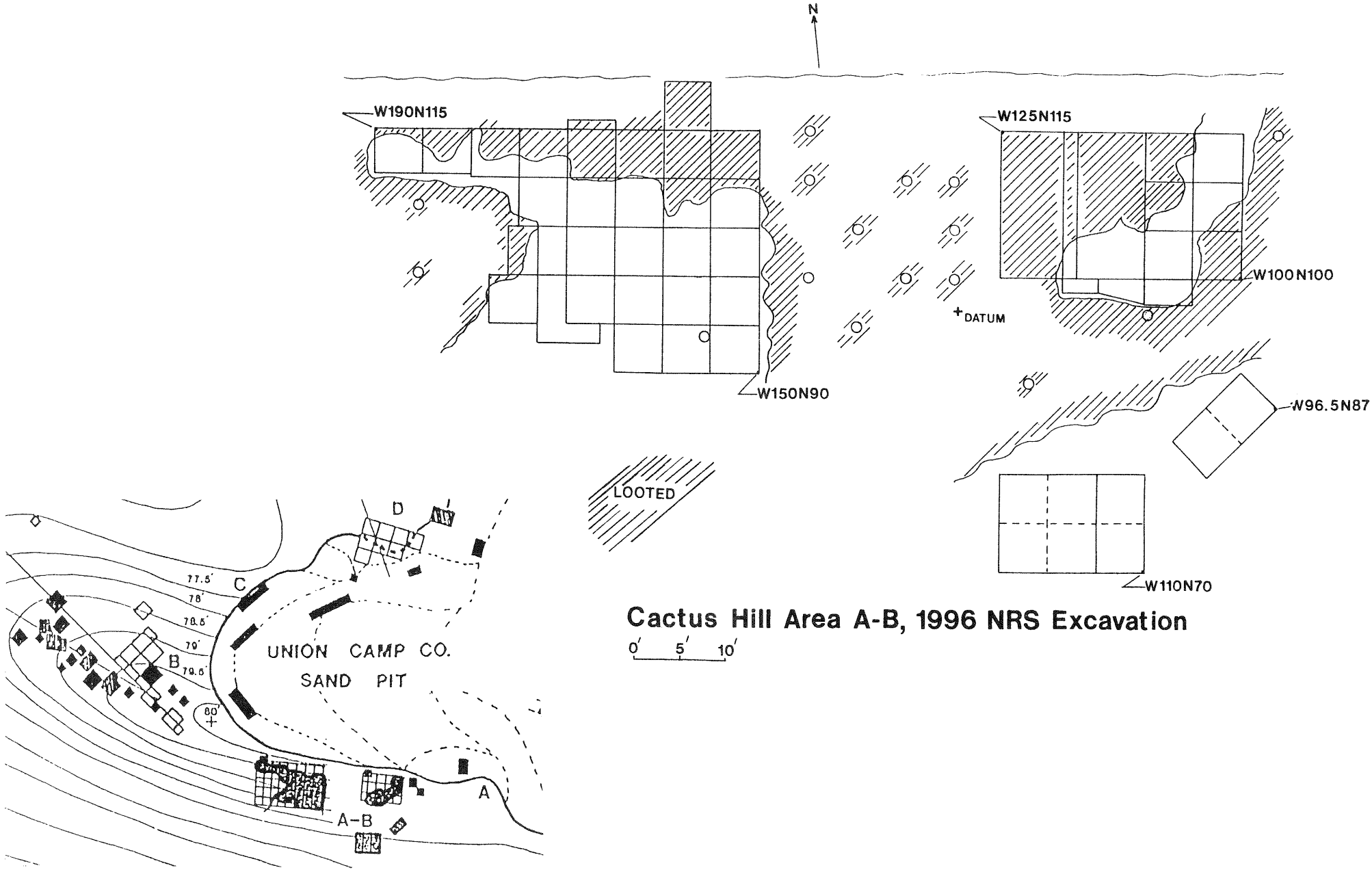


Figure 2. Cactus Hill area A-B, 1996 NRS excavation plan for the south ridge over wetland.

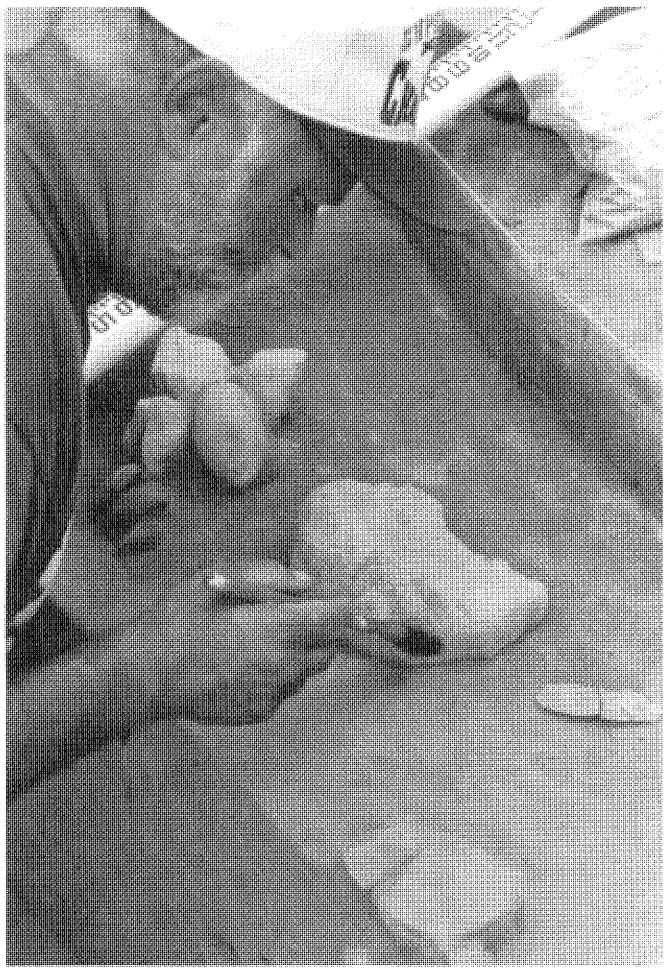


Figure 3. NRS excavation of Late Archaic levels of units W105N97.5 through W110N98 in area A-B, Cactus Hill Site in early June 1996. The units are under investigation by volunteers.

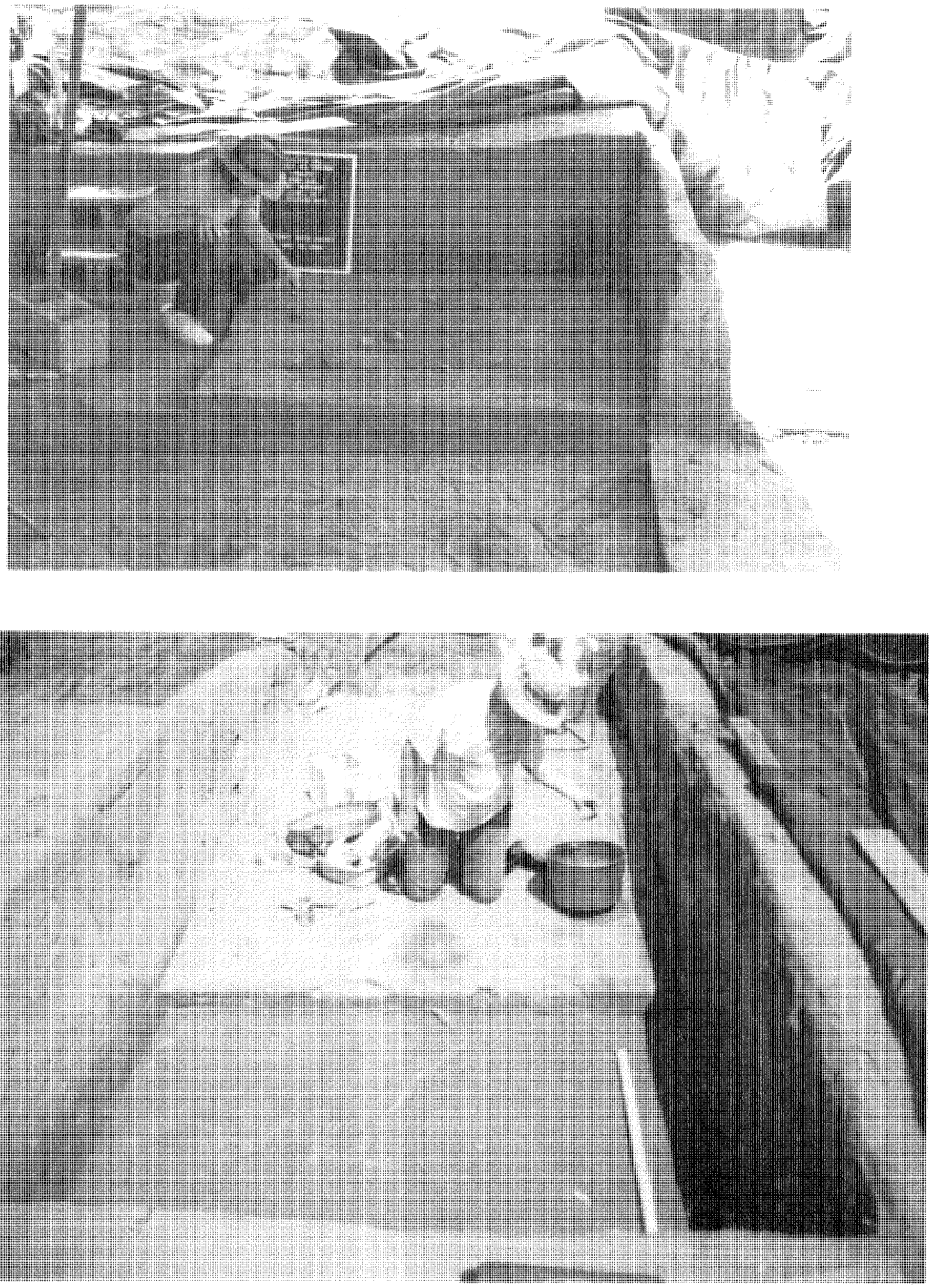
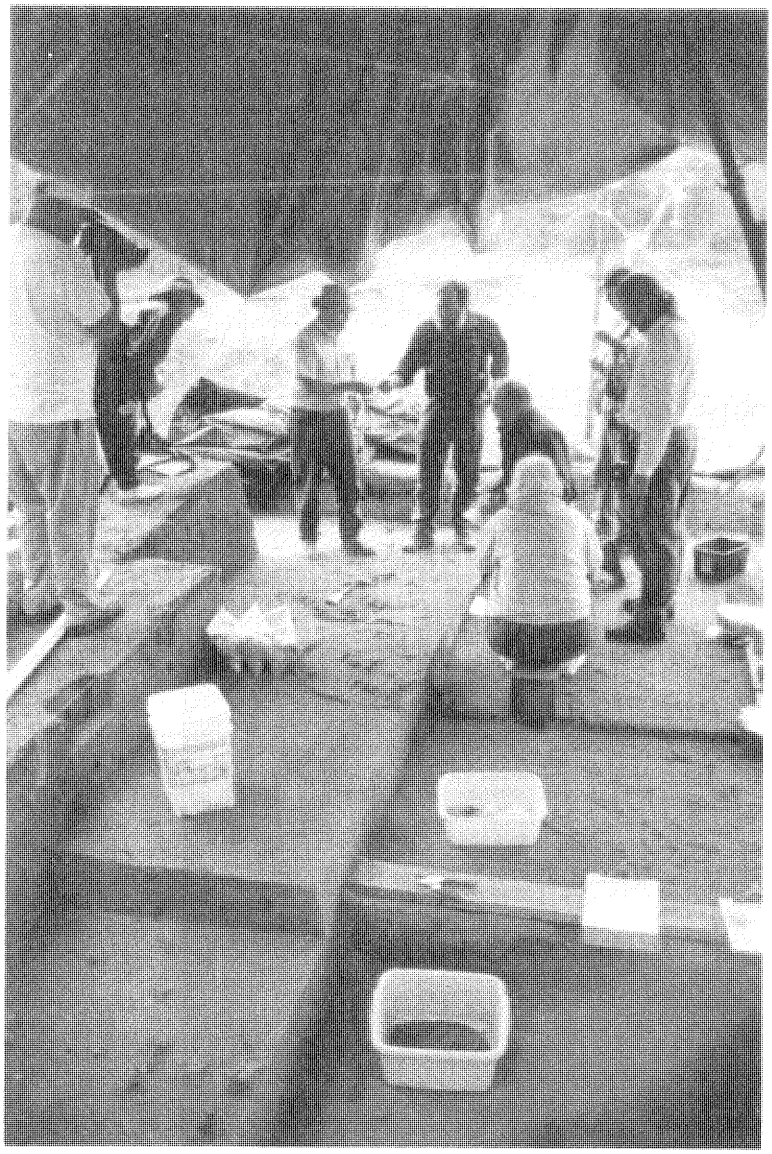


Figure 4. NRS excavation of area A-B, Cactus Hill Site in spring 1996. Top, NRS volunteer excavating a blade cluster below the Clovis level in unit W165N105; bottom, NRS volunteer excavating a blade level below the Clovis level in unit W110N100.

Figure 5. NRS excavation of area A-B, Cactus Hill site in spring 1996. Top, volunteer working in the west block of units in the upper levels. Bottom, ASU field school working in the east block of units at W105N100 through N110.



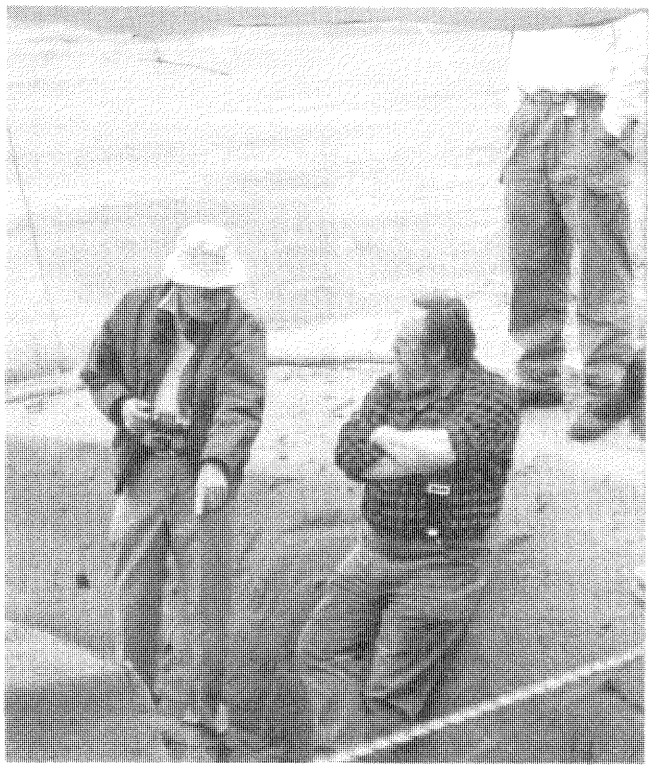


Figure 6. Visit to Cactus Hill on 5/27/96 by Haynes and Stanford, inspecting various excavation units with NRS volunteers.

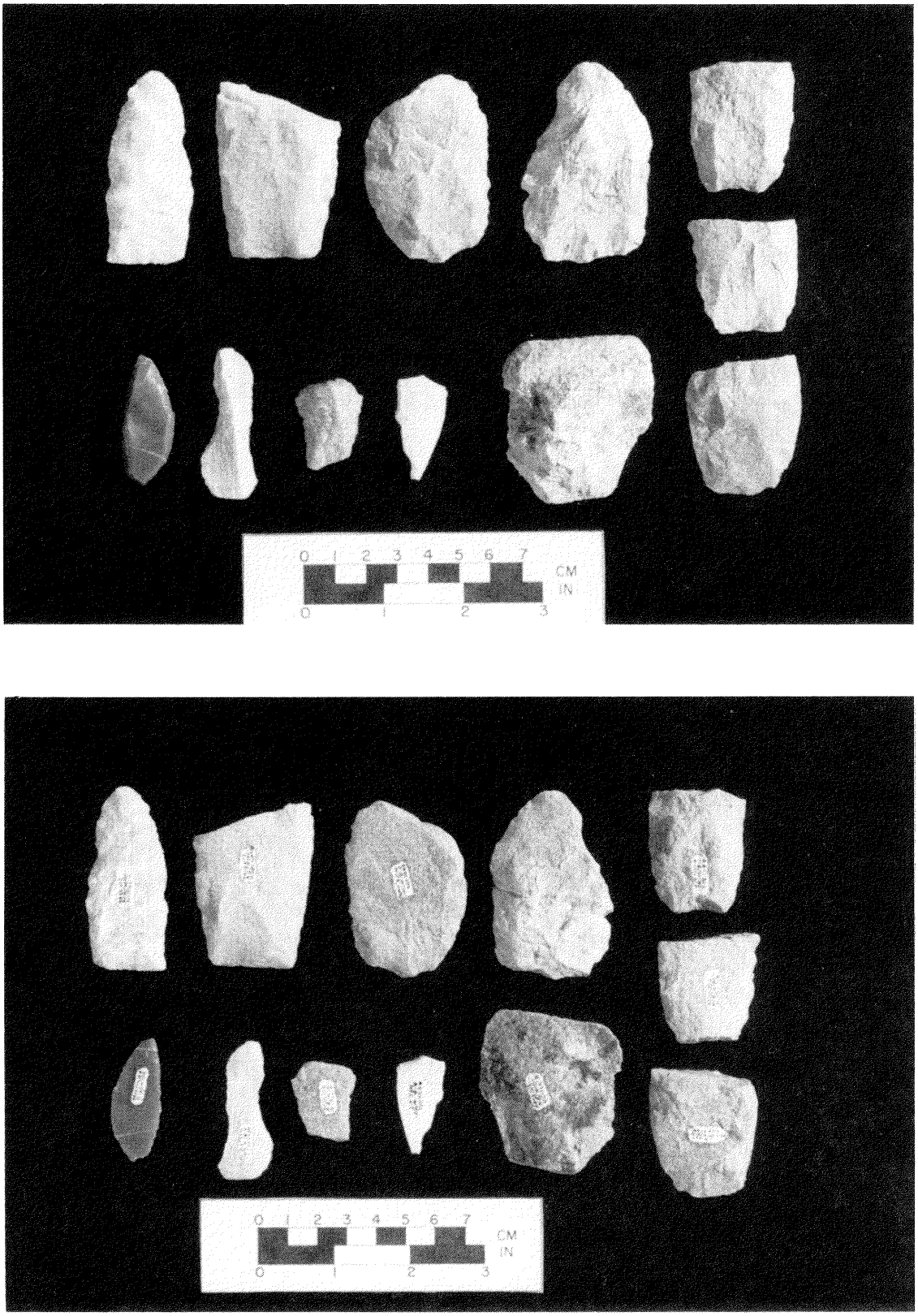


Figure 7. Clovis artifacts excavated in area A-B on Cactus Hill in spring 1996; shown are Clovis preforms of chert and quartzite, and unifacial tools. Photograph of obv. (top), and of rev. (bottom).

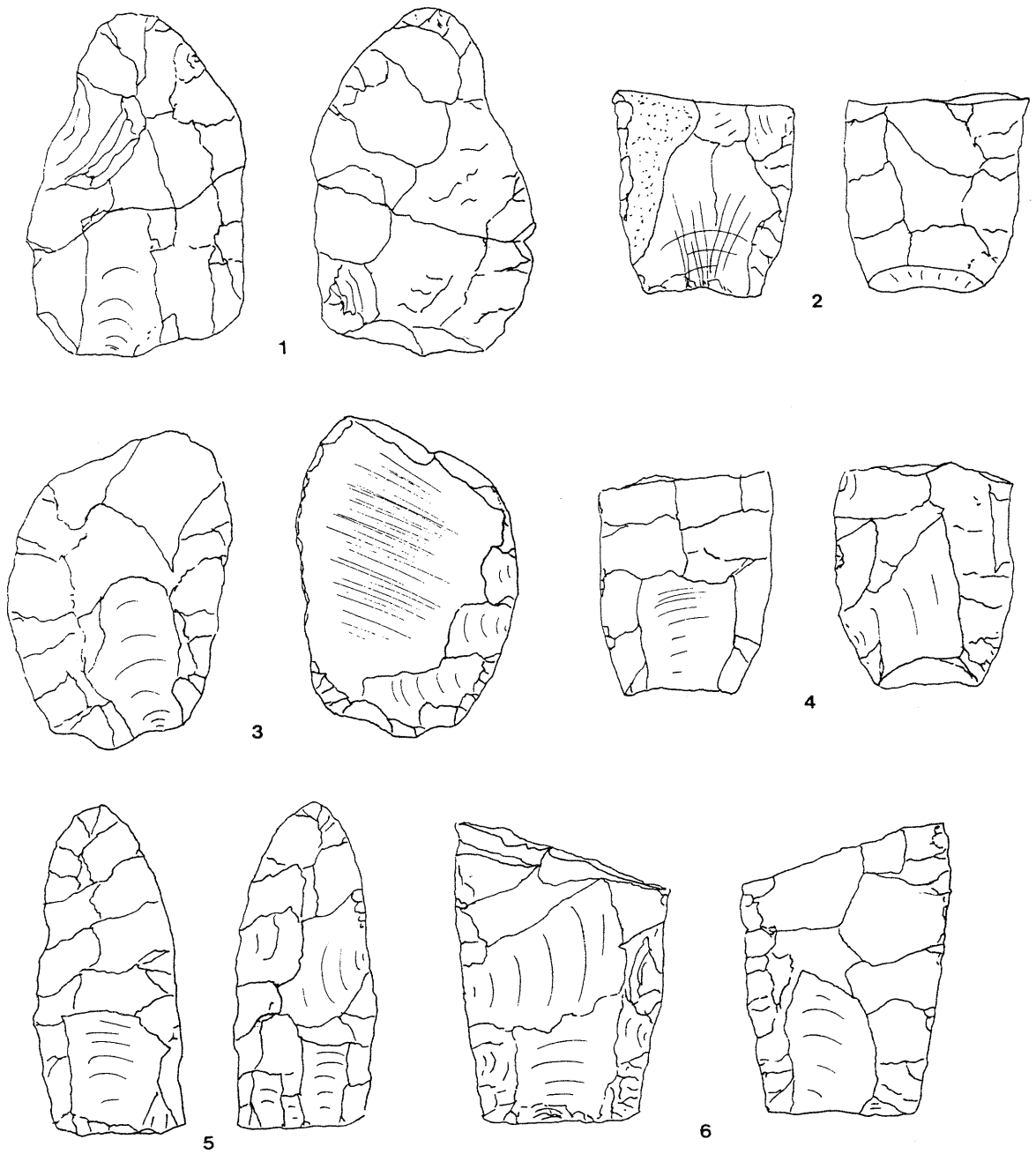


Figure 8. Clovis artifacts excavated by NRS in area A-B on Cactus Hill in spring 1996; 1, Clovis preform (rejoined from two pieces) of green chert found in level 8 of units W165N100 and N105; 2, Clovis preform of brown quartzite found in level 8 of unit W180N110; 3, Clovis preform of brown quartzite found in looted area of unit W100N105; 4, Clovis preform of brown quartzite found in level 9 of unit W180N110; 5, Clovis preform of Williamson chert found in level 7 of unit W155N100; 6, Clovis preform of brown quartzite found in looted area of unit W110N110.

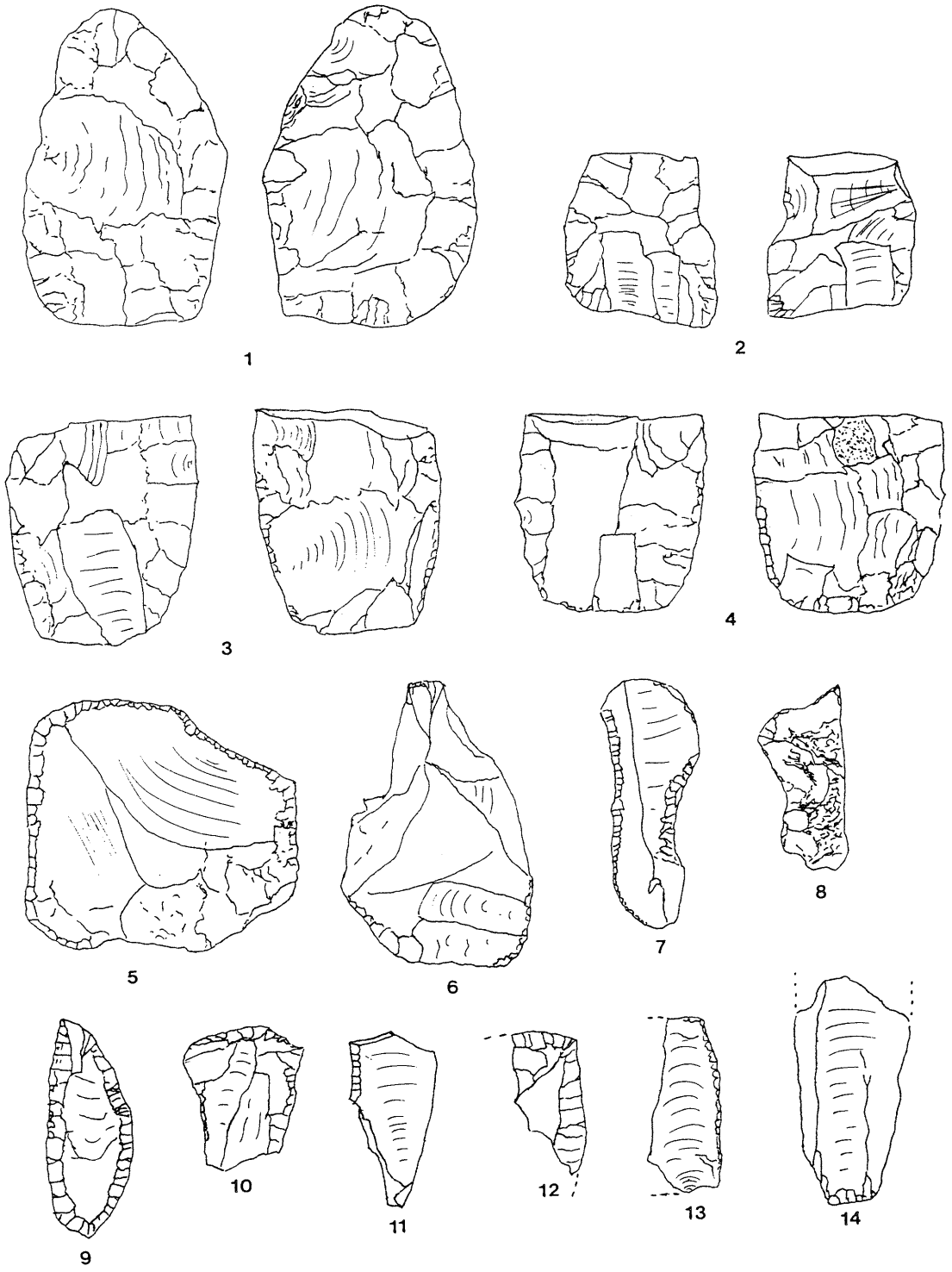


Figure 9. Clovis artifacts excavated by NRS in area A-B on Cactus Hill in spring 1996; 1, Clovis preform of white quartz found in level 9 of unit W160N95; 2, Clovis preform of white quartz found in level 7 of unit W160N95; 3, Clovis preform of gray-brown quartzite found in level 9 of unit W160N100; 4, Clovis preform of gray-brown quartzite found in level 8 of unit W160N95; 5, side scraper of chert found in level 8 of unit W110N100; 6, chisel graver of brown jasper found in level 9 of unit W160N105; 7, spokeshave of blue Williamson chert found in level 8 of unit W160N95; 8, graver of Mitchell chert found in level 9 of unit W155N95; 9, limace (slug-like uniface) of blue ("mountain") chert found in level 10 of unit W160N100; 10, end scraper with graver spur of brown quartzite found in level 7 of unit W170N110; 11, snapped graver on scraper fragment of Mitchell chert, found in level 9 of unit W160N95; 12, end scraper fragment (fire exploded) of jasper found in level 6 of unit W160N95; 13, wedge core - edge used/damaged of fired Williamson chert found in level 10 of unit W160N100; 14, core blade of gray quartzite found in level 7 of unit W170N110.

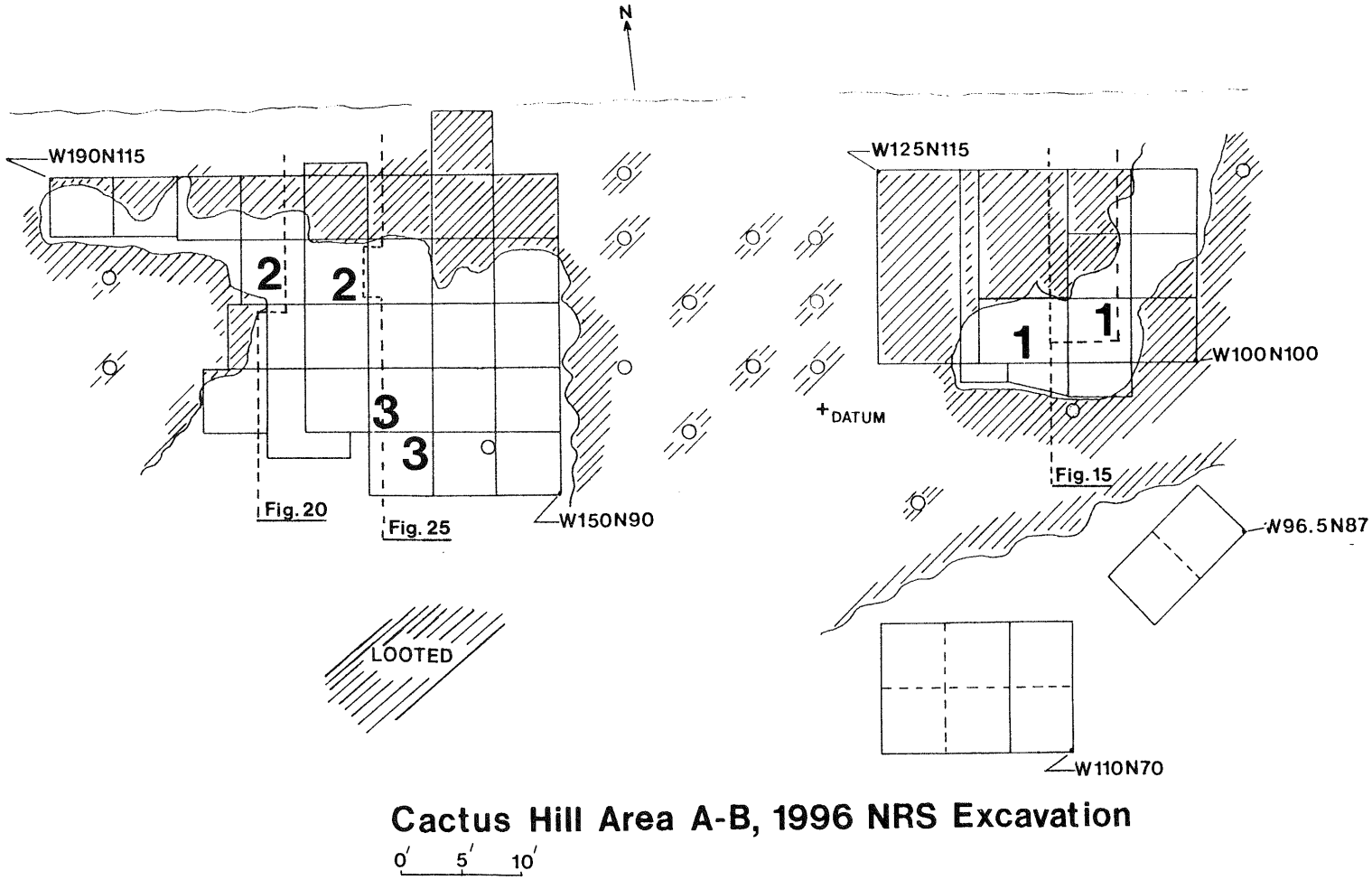
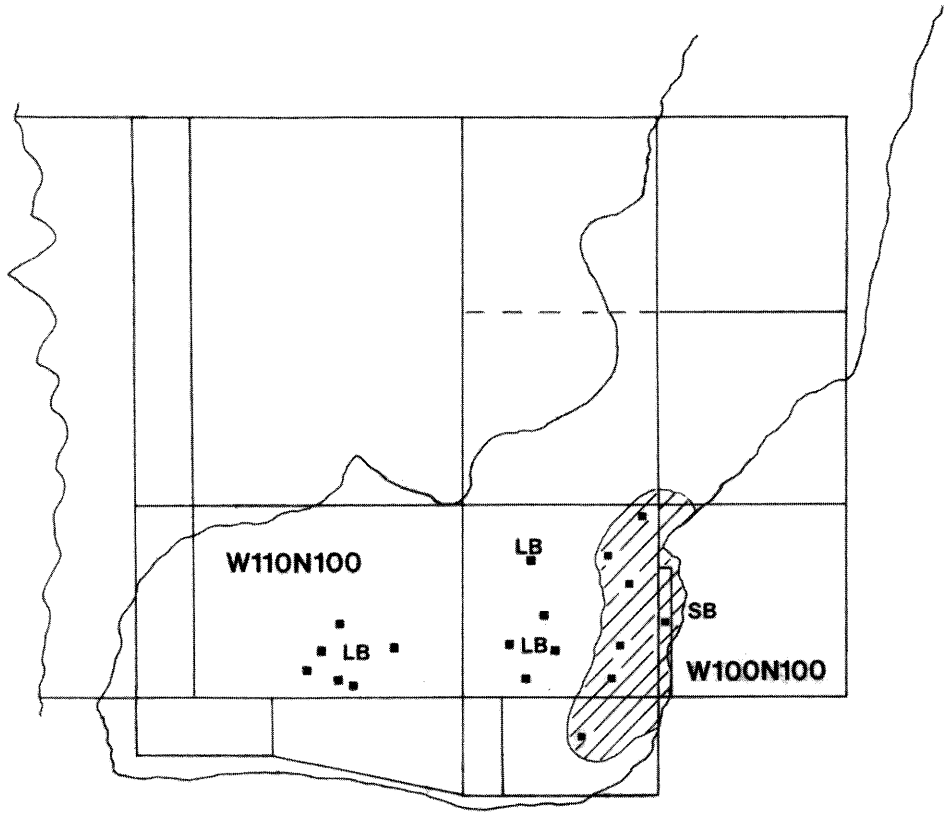
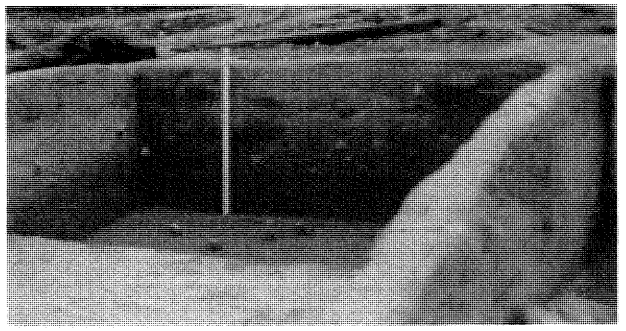


Figure 10. The three cluster areas, 1, 2, and 3, discovered in the spring 1996 excavation of area A-B on the Cactus Hill Site; cluster area 3 represented a mixture of artifacts of several periods.





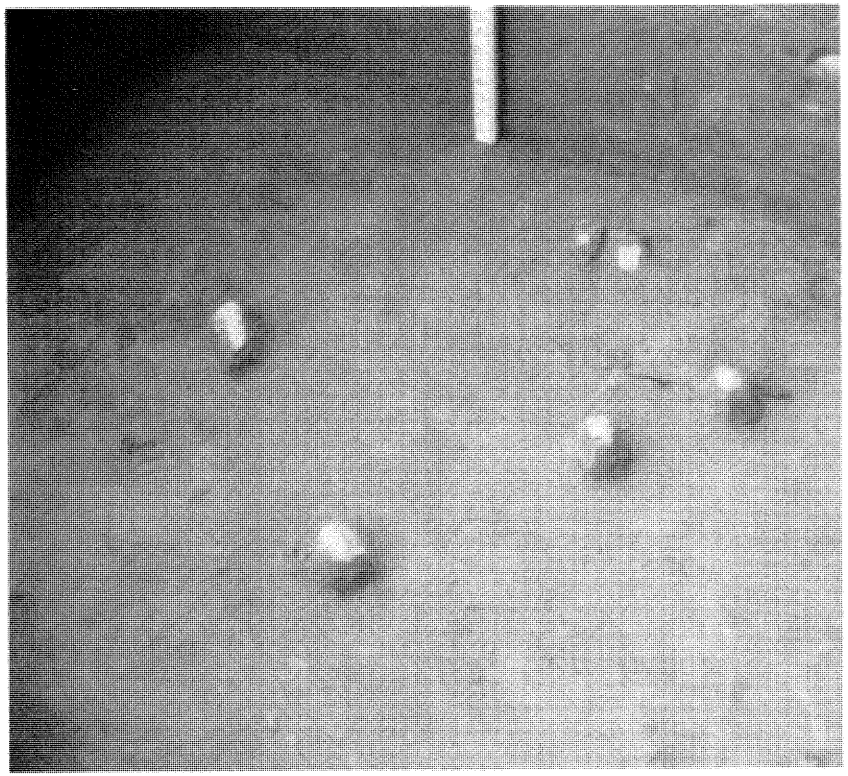


Figure 11. Location of discovery of each core blade in blade cluster 1, representing units W105N100 levels 12 and 13, W110N100 levels 10 and 11, W100N100 level 12, and W105N97.5 level 10; two time periods are represented by the material from level 12 (small blades) and the material from level 13 (large blades) of unit W105N100. LB = large blade, SB = small blade, cross checked area = small blade cluster. Photograph of blades during excavation in level 10 of unit W110N100.

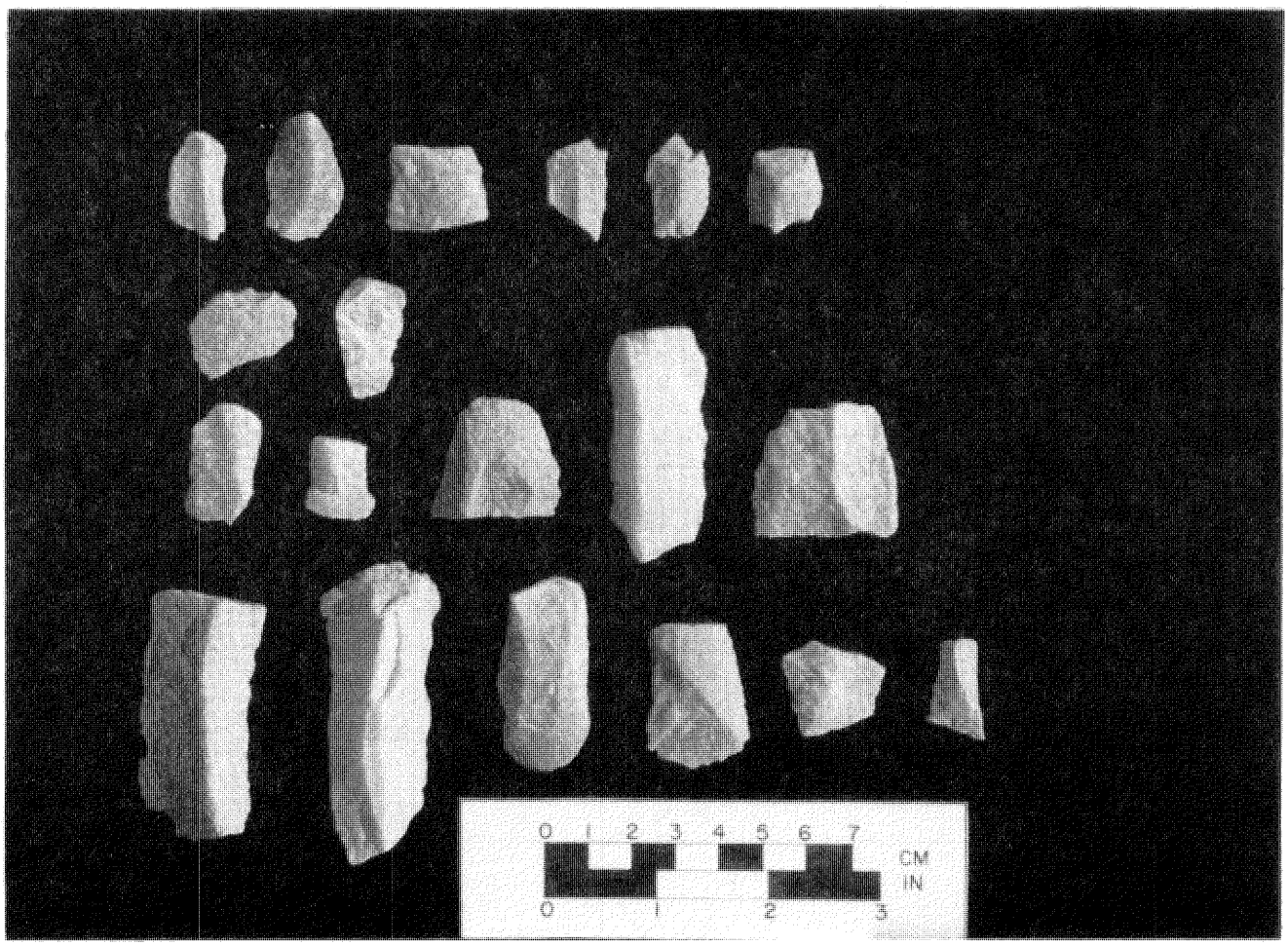


Figure 12. Photograph of core blades from blade cluster 1, levels 12 and 13 of unit W105N100 (top three rows), and levels 10 and 11 of unit W110N100 (bottom row).

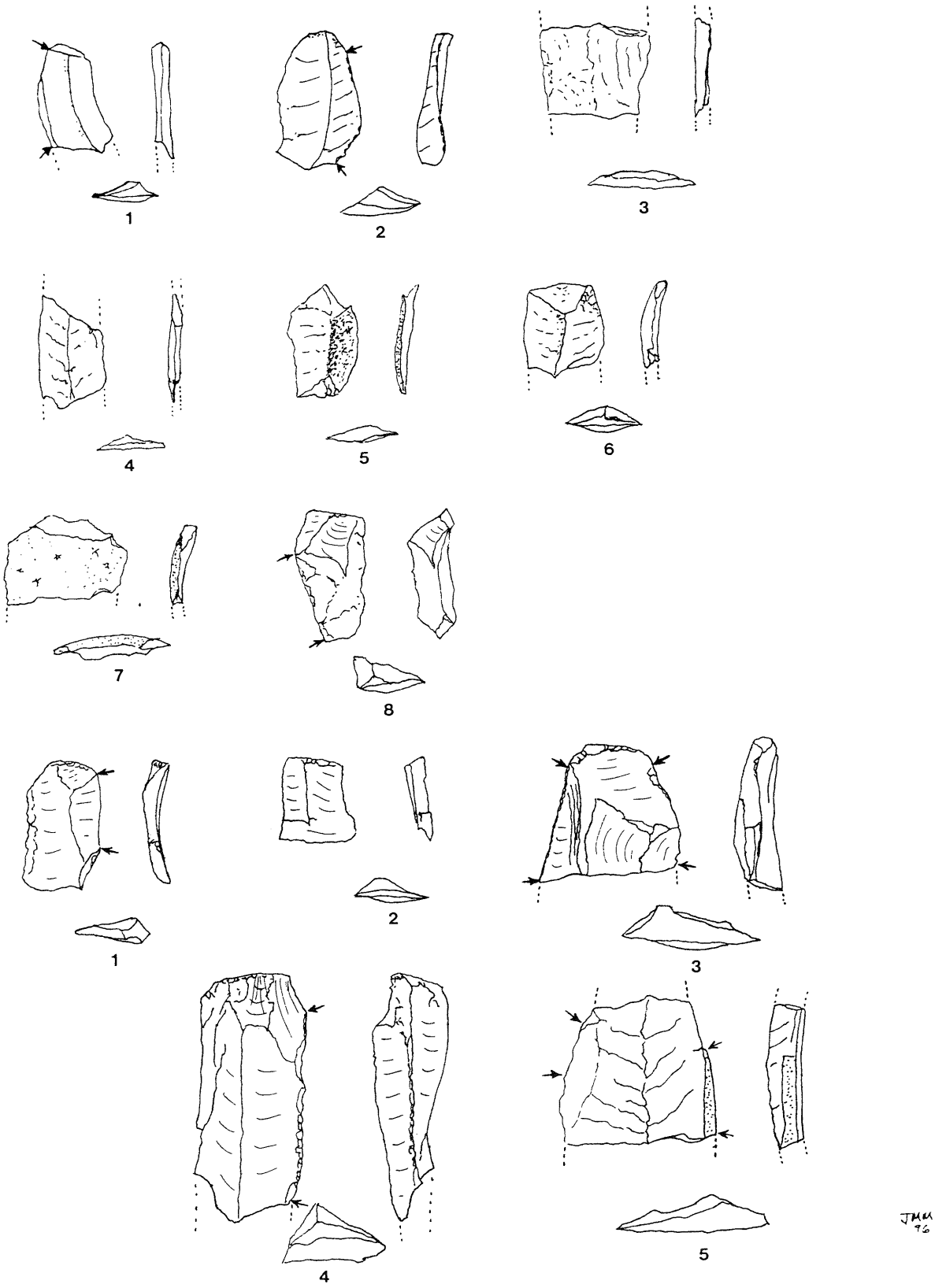


Figure 13. Drawings of core blades from blade cluster 1; 1 through 8 (top) are from level 12 of unit W105N100, 1 through 5 (bottom) are from level 13 of unit W105N100. Arrows at edge of blades note extent of work or use damage/wear.

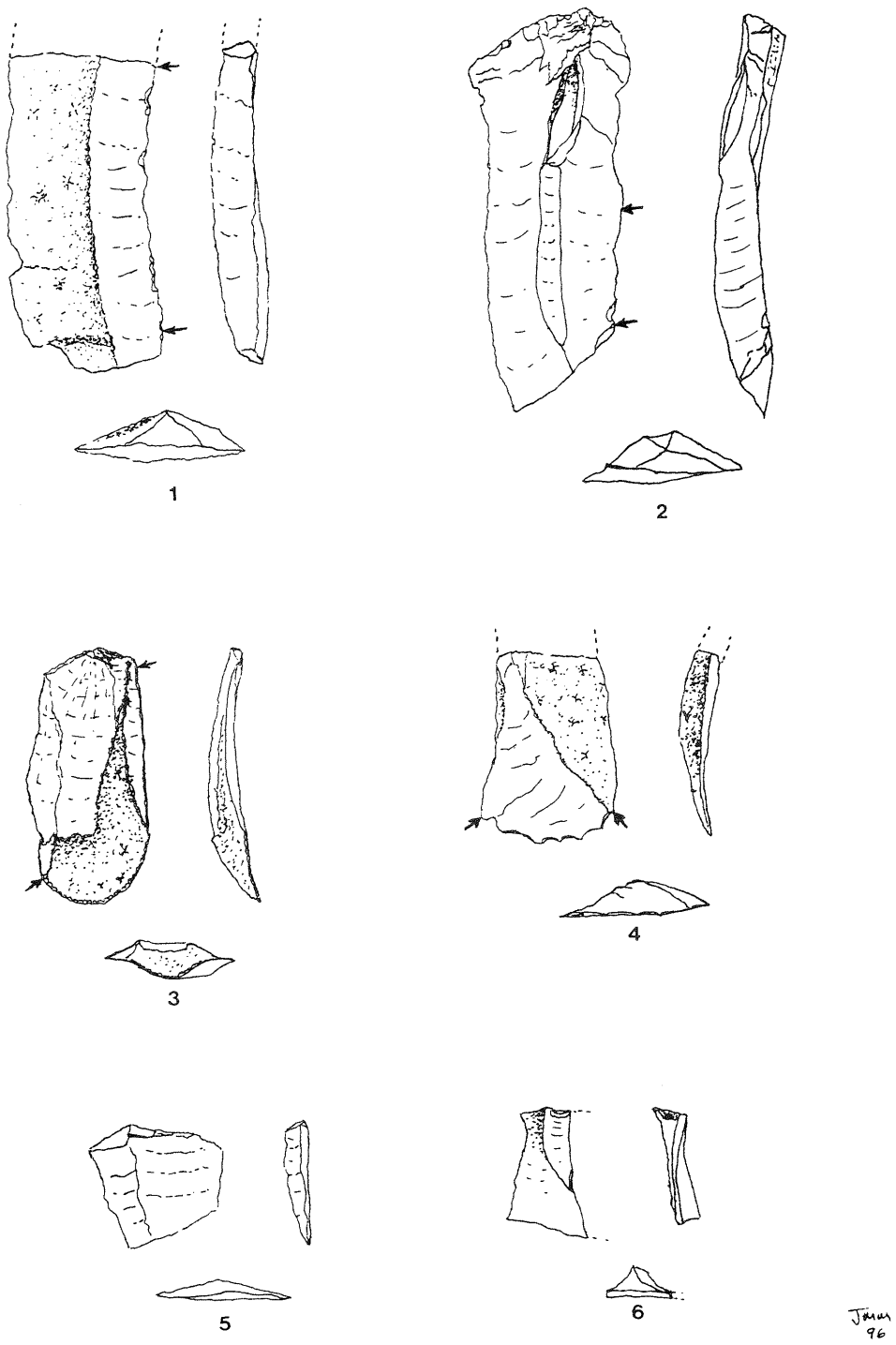


Figure 14. Drawings of core blades from blade cluster 1; 1 through 6 are from levels 10 and 11 of unit W110N100. Arrows at edge of blades note extent of work or use damage/wear.

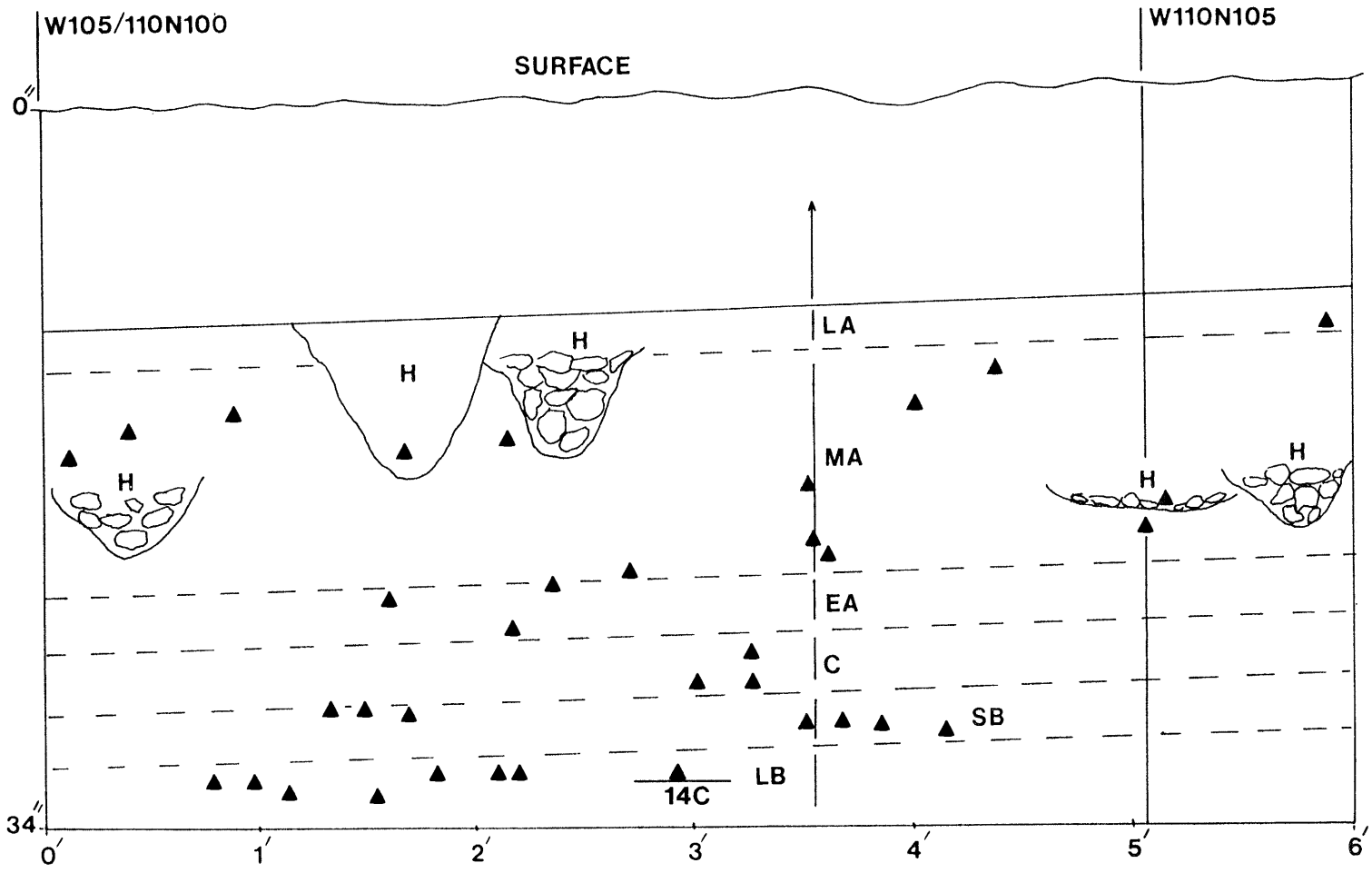
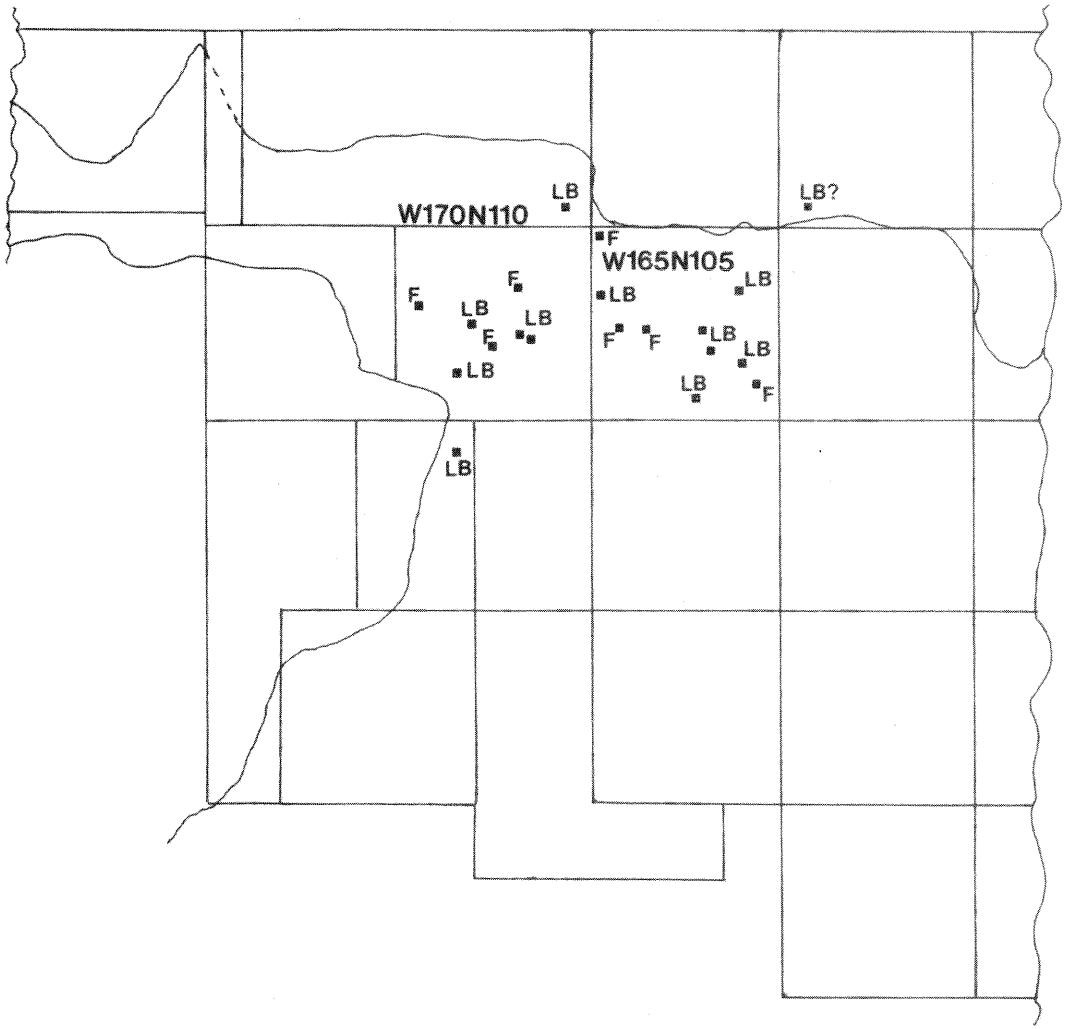
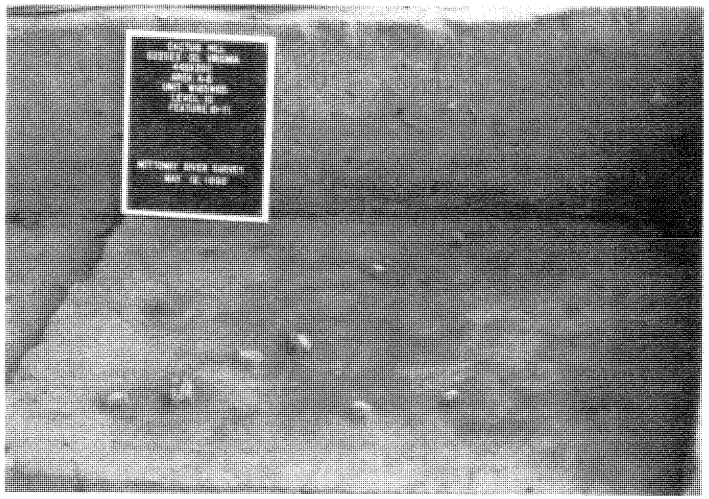


Figure 15. Cross section, south-to north over 6 feet, through units W105N100/ W110N100 showing stratigraphic culture sequence and the position of clusters of large blades and small blades. The location from which a sample was taken for a carbon 14 date is indicated in unit W110N100. LA = Late Archaic, MA = Middle Archaic, EA = Early Archaic, C = Clovis, SB = small core blade, LB = large core blade, H = hearth, Triangles = diagnostic artifacts including projectile points, Clovis preforms, Clovis unifacial tools, and core blades.





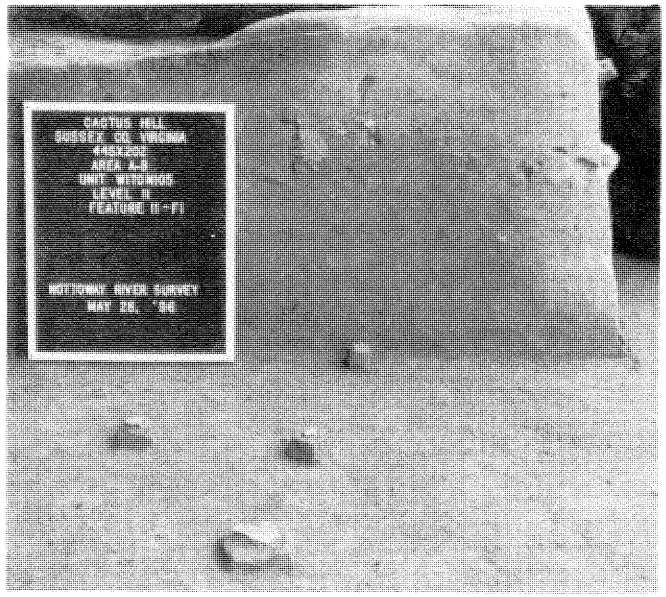


Figure 16. Location of discovery of each core blade in blade cluster 2, representing units W165N105 level 10, W170N105 level 11, and small areas of W170N110 and W173N100 level 10. LB = large blade, F = small flake. Top photograph, blade cluster during excavation in unit W165N105; bottom photograph, blade cluster during excavation in unit W170N105.

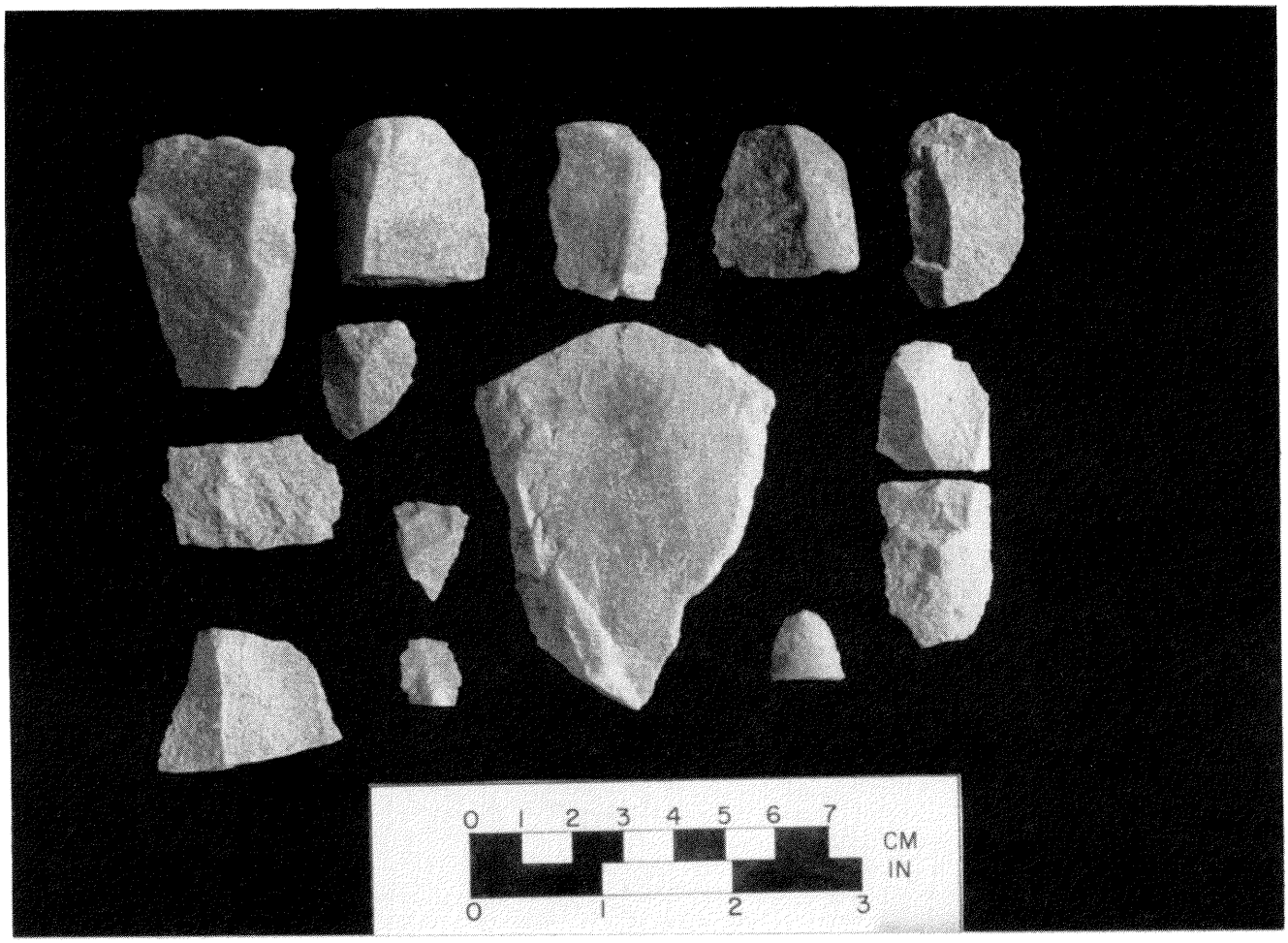


Figure 17. Photograph of core blades from blade cluster 2, level 10 of unit W165N105, and adjacent level 11 of unit W170N105.

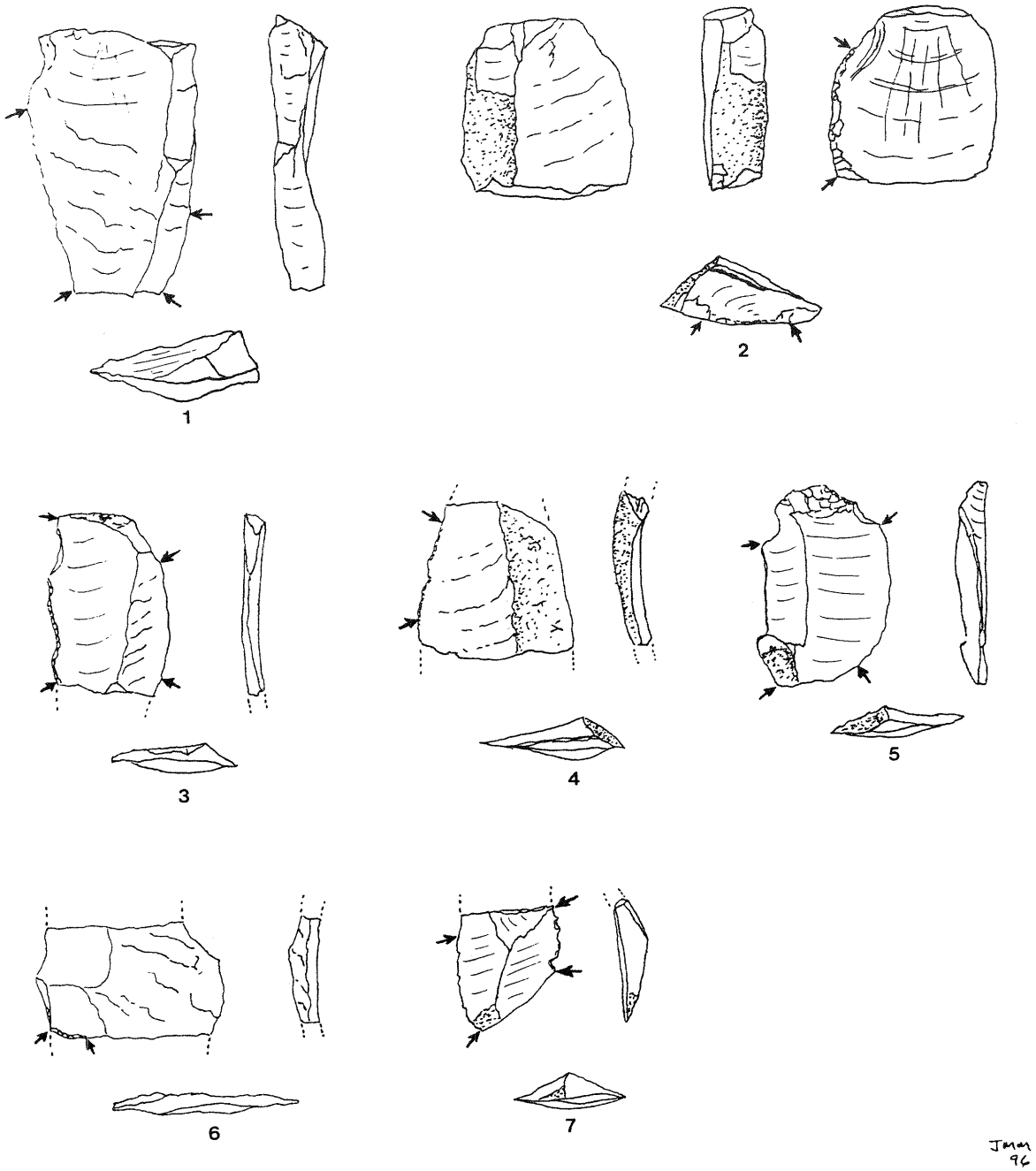


Figure 18. Drawings of core blades from blade cluster 2; 1 through 7 (except 6) are blades from W165N105 level 10, and item 6 is a used flake found in the blade cluster. Arrows at edge of blades note extent of work or use damage/wear.

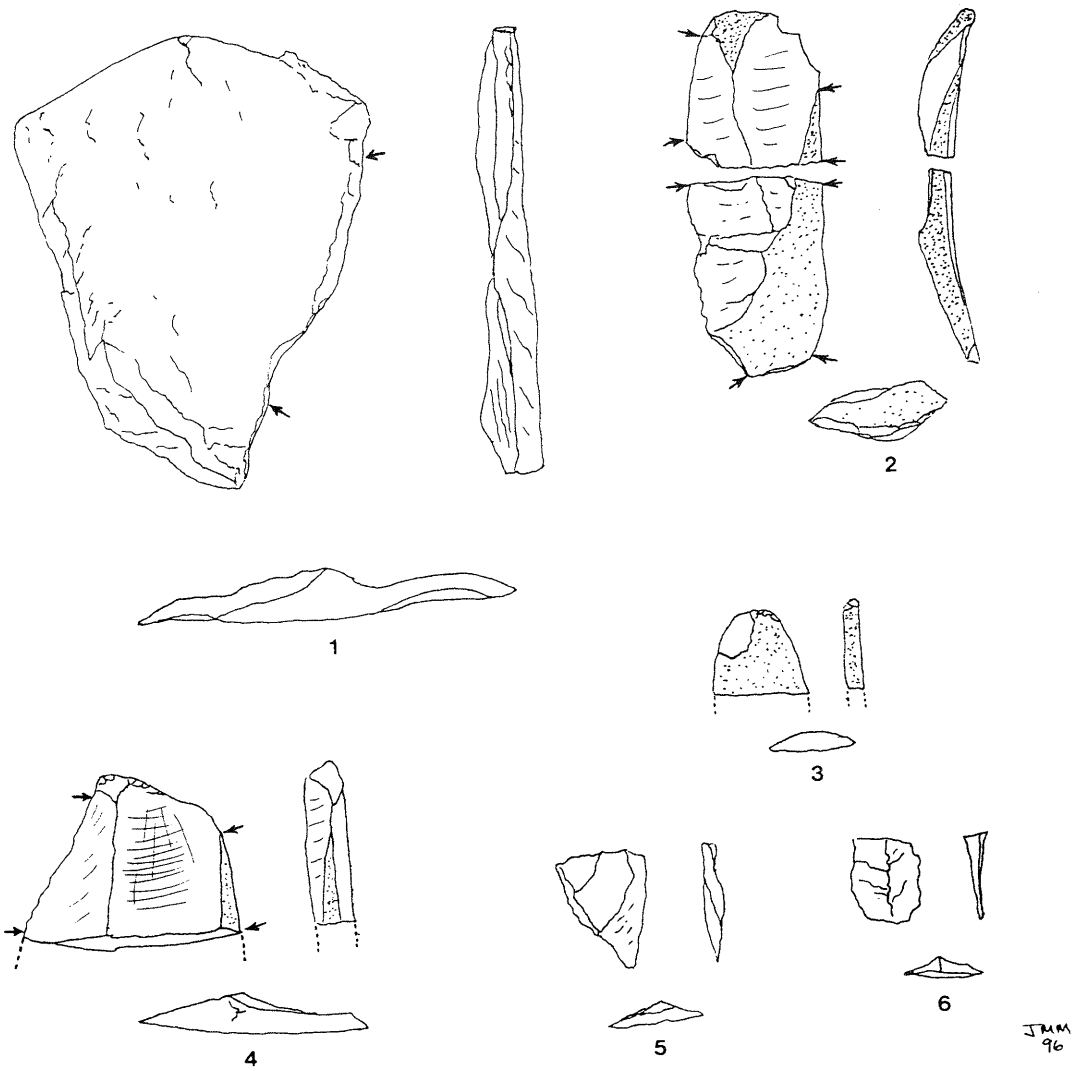


Figure 19. Drawings of core blades from blade cluster 2; 1, 2, and 4 are blades from W170N105 level 11, and items 3, 5, and 6 are small flakes from core preparation associated with the core blade removal. Arrows at edge of blades note extent of work or use damage/wear.

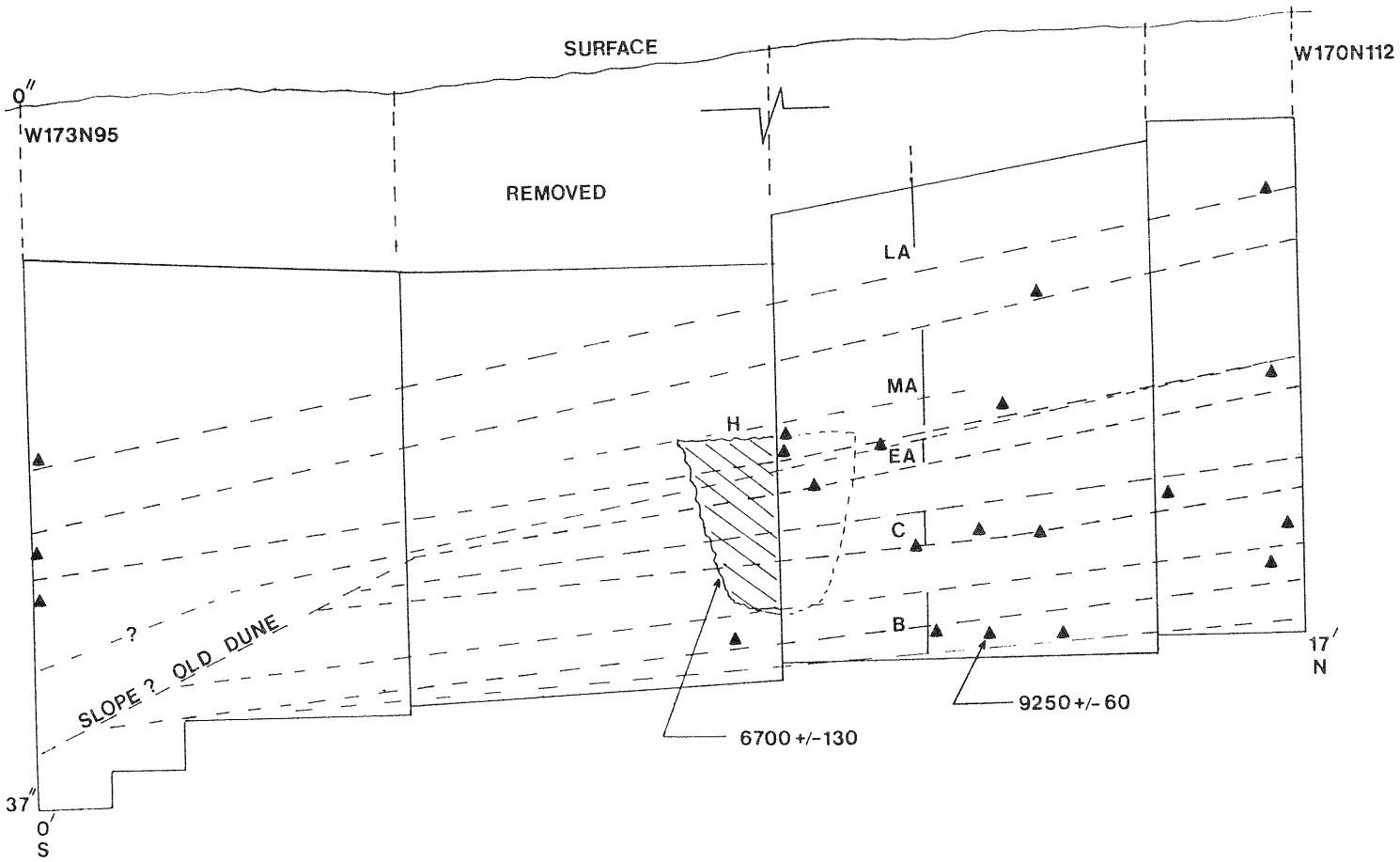
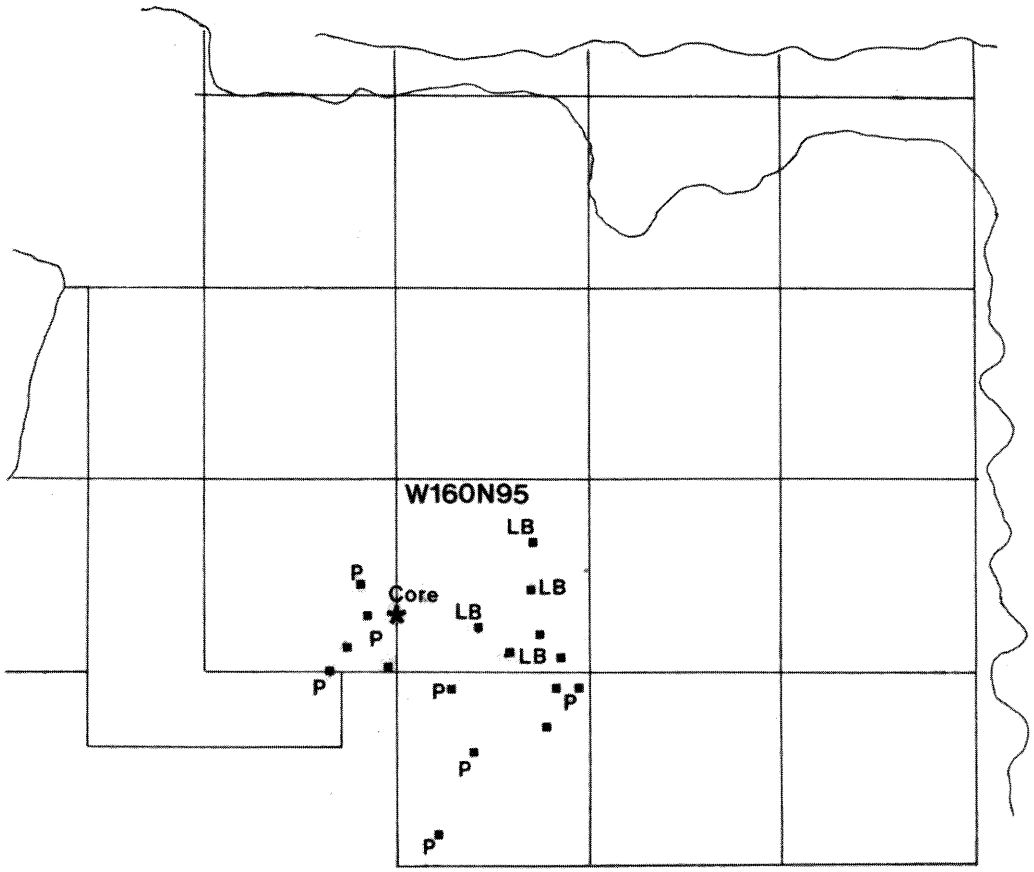


Figure 20. Cross section, south-to-north across 17 feet, through units W173N95, W173N100, W173/W170/N105, and W170N110 (to W170N112) showing stratigraphic culture sequence and the position of clusters of large blades. Locations from which samples were taken for carbon 14 dates are indicated in units W173/W170N105. LA = Late Archaic, MA = Middle Archaic, EA = Early Archaic, C = Clovis, B = blade level, H = hearth, Triangles = diagnostic artifacts including projectile points, Clovis preforms, Clovis unifacial tools, and core blades.



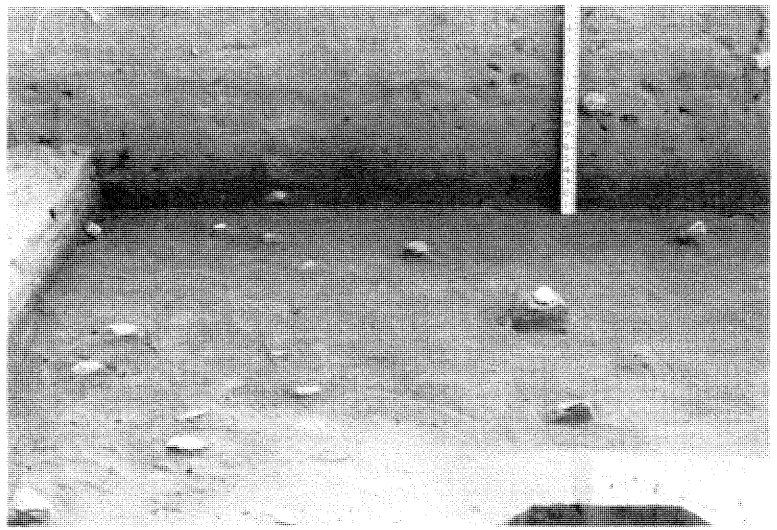


Figure 21 Location of discovery of each core blade in blade cluster 3, representing units W160N95, W165N95, and W160N90. The blades in W160N95 were recovered in level 9. A blade core was recovered in unit W165N95 in level 9, and core blades of possible Paleoindian age were recovered deep in the dune sands in W160N90 levels 12 and 13. LB = large blade of probable Paleoindian age, and P = the location of discovery of a blade of possible Paleoindian age. Photograph is excavation by NRS volunteer of blade cluster 3 in unit W160N95, level 9 with Clovis and possible Archaic period material intermixed.

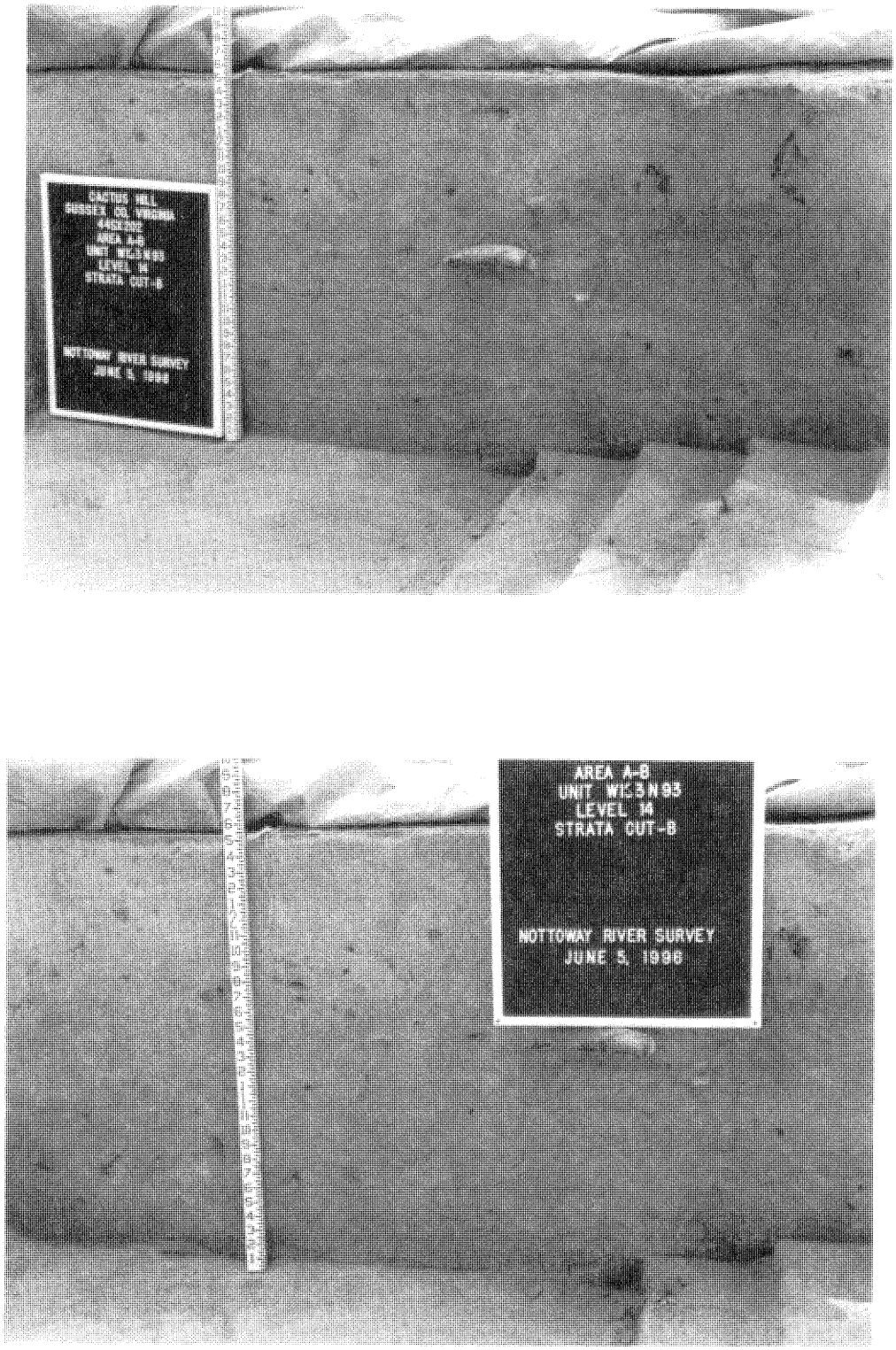


Figure 22. Dune profile in unit W163N93 of area A-B of Cactus Hill showing old silt banded region of the dune merging with an area of more recent sand fill. NRS excavation spring 1996. Top photograph shows silt bands highlighted; bottom photograph shows natural appearance of silt bands.

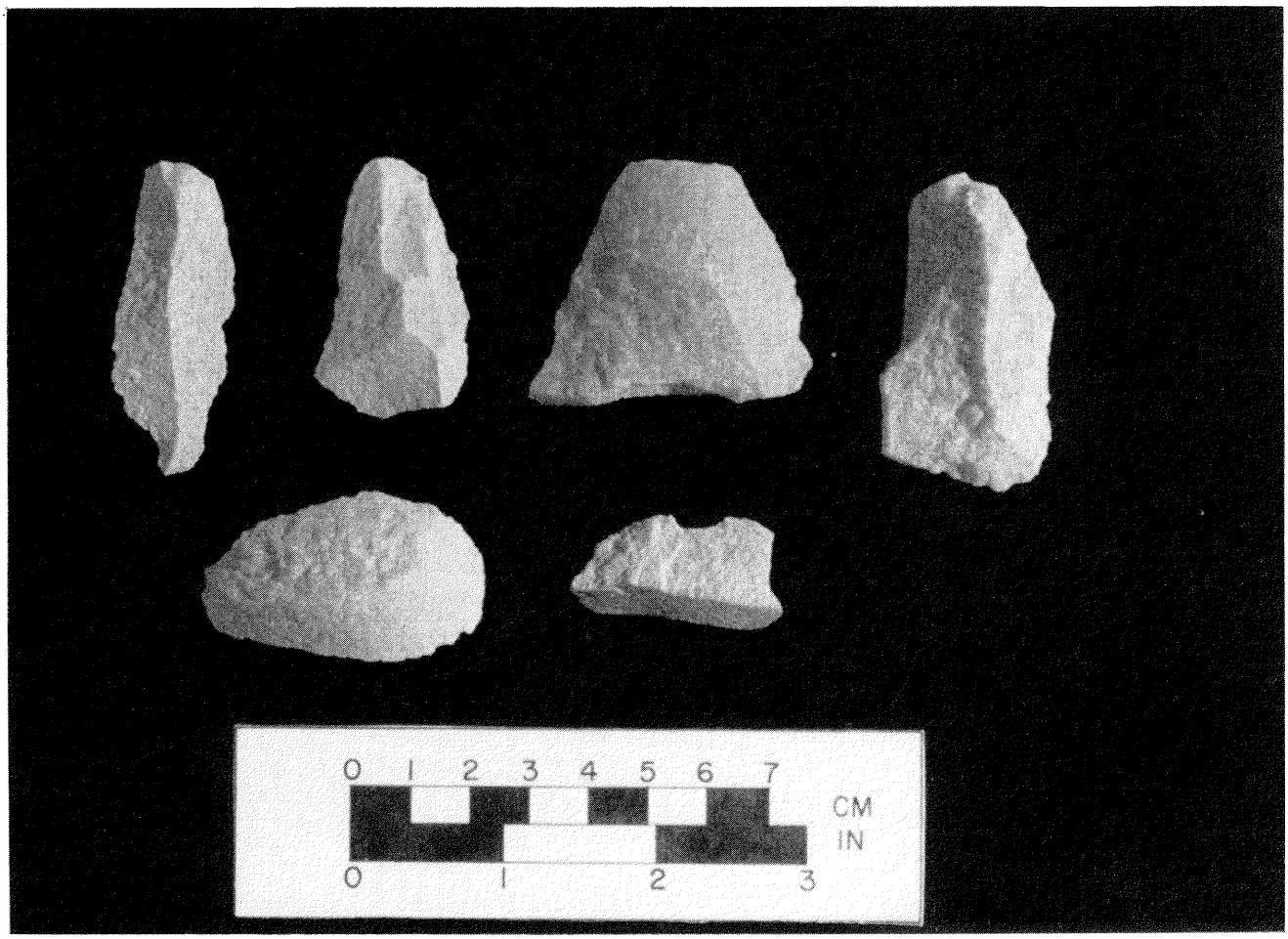


Figure 23. Photograph of core blades of probable Paleoindian age from blade cluster 3, level 9 of unit W160N95.

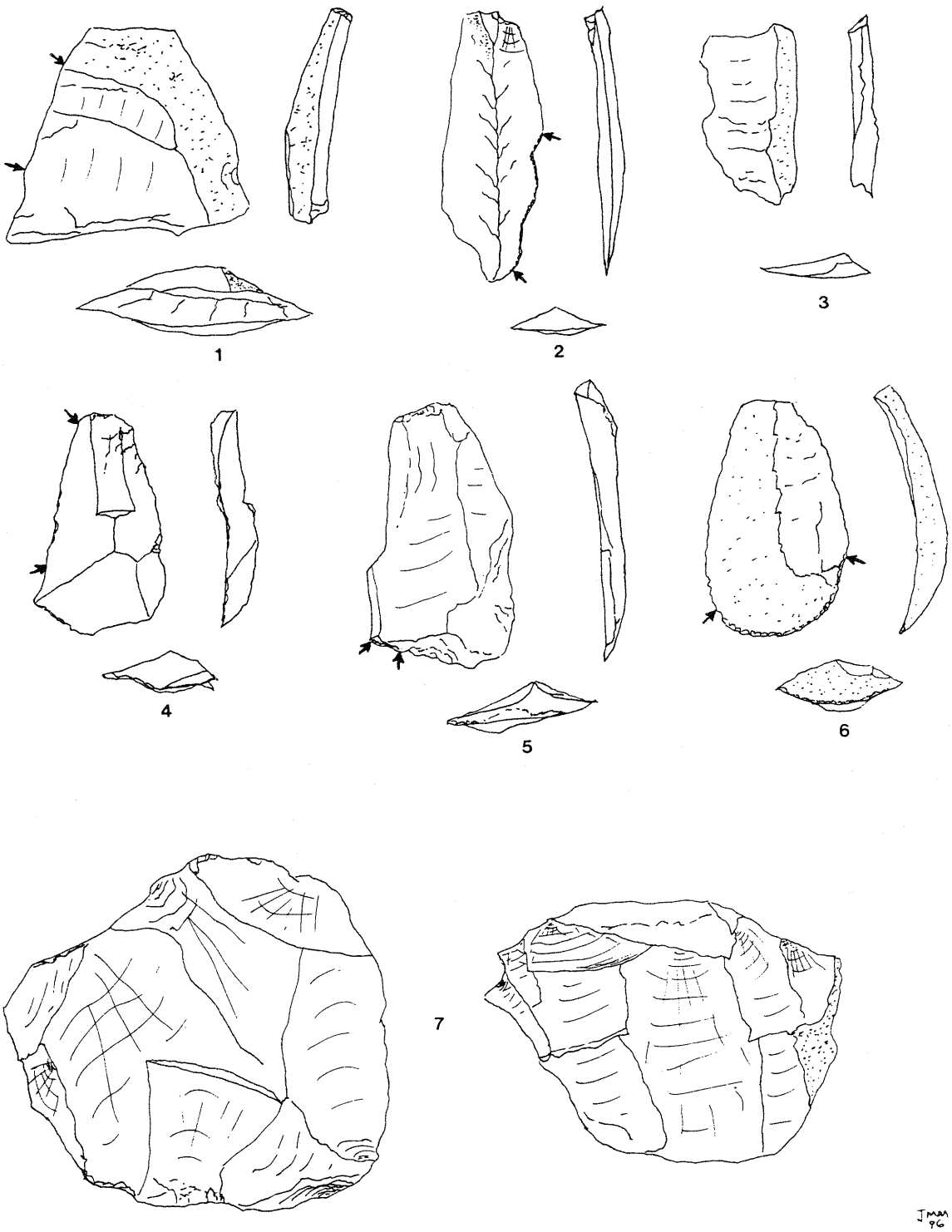


Figure 24. Drawing of core blades, and one blade core from blade cluster 3; 1 through 6 are blades from W160N95 level 9, and item 7 is a blade core from W165N95 level 9. Arrows at edge of blades note extent of work or use damage/wear.

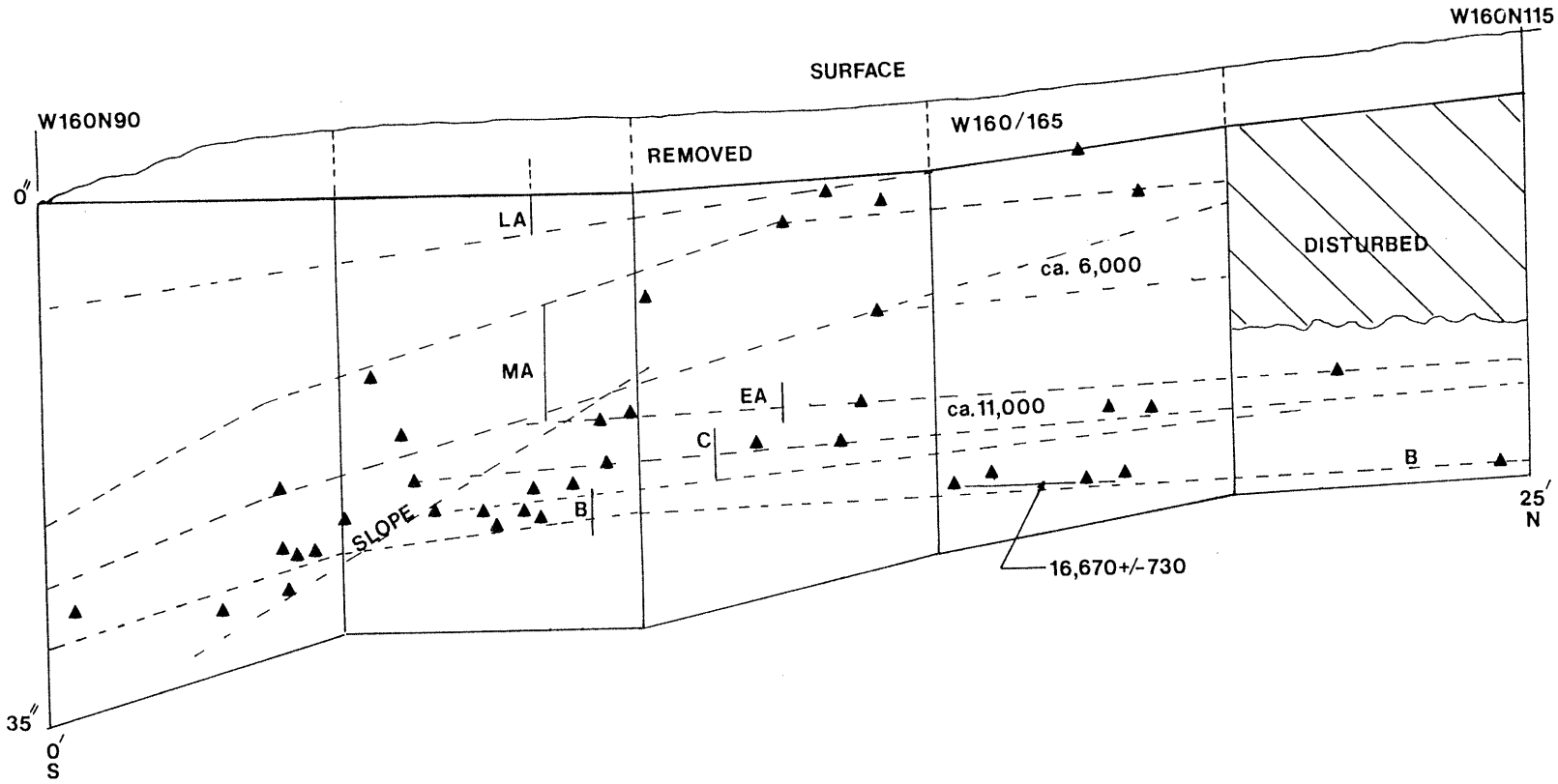


Figure 25. Cross section, south-to-north across 25 feet, through units W160N90, W160N95, W160N100, W160/W165(just west into W165)N105, and W160N110 showing stratigraphic culture sequence and the position of the cluster of large blades. The location from which a sample was taken for a carbon 14 date is indicated at the edge of unit W165N105 near unit W160N100. LA = Late Archaic, MA = Middle Archaic, EA = Early Archaic, C = Clovis, B = blade level, Triangles = diagnostic artifacts including projectile points, Clovis preforms, Clovis unifacial tools, and core blades.

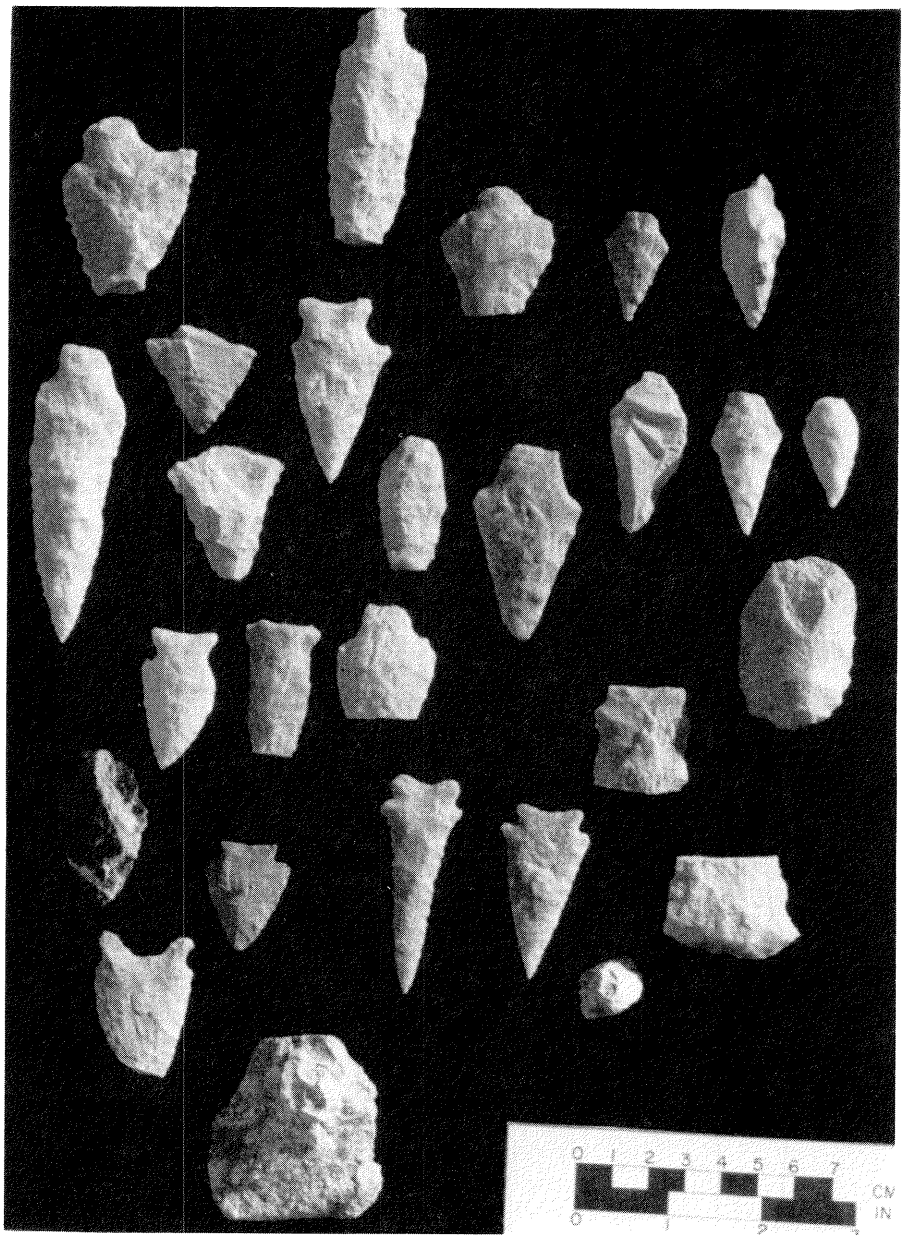


Figure 26. Photograph of typical Archaic Period diagnostic artifacts in stratigraphic sequence (as excavated) in eastern units in area A-B of Cactus Hill, 1996 NRS excavation. Several excavation units are represented by the artifact sequence, and the artifact at bottom of the photograph is a Clovis side scraper.

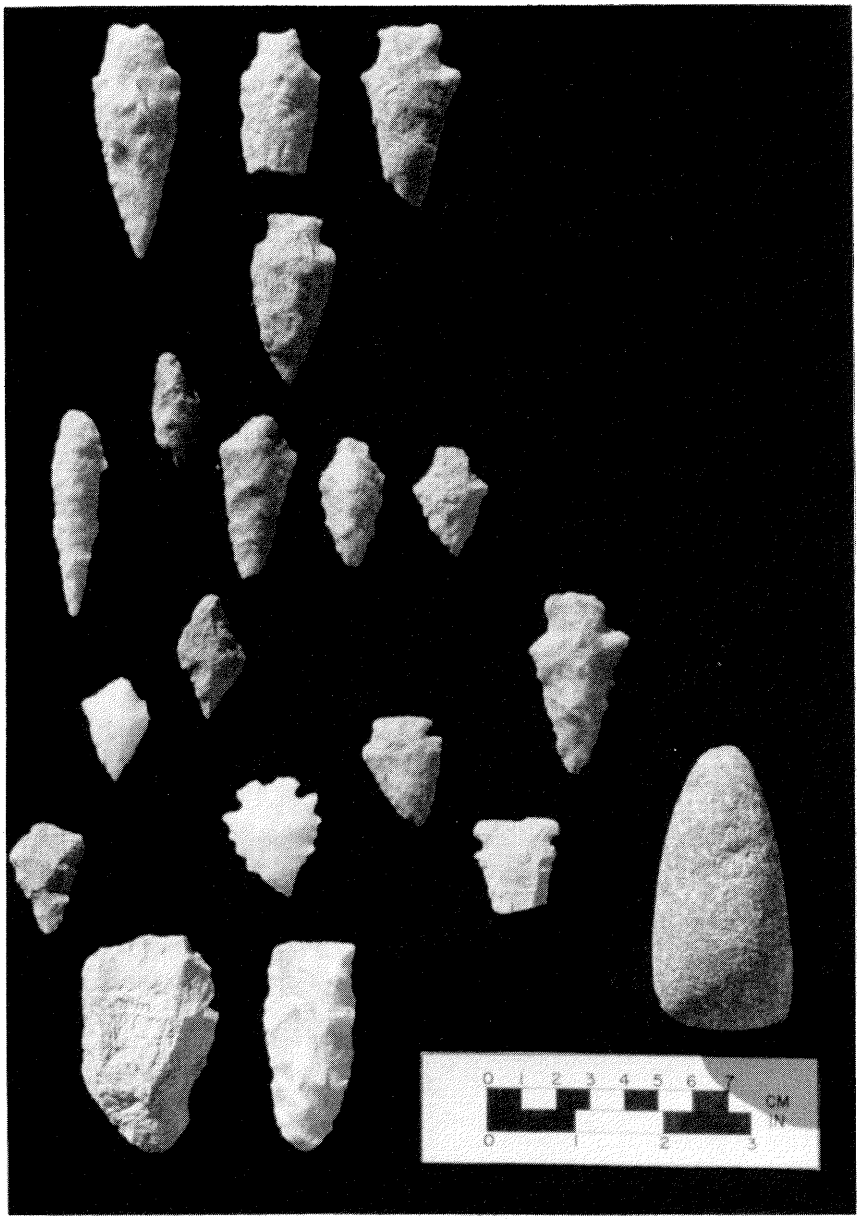


Figure 27 Photograph of typical Archaic Period diagnostic artifacts in stratigraphic sequence (as excavated) in western units in area A-B of Cactus Hill, 1996 NRS excavation. Several excavation units are represented by the artifact sequence. Clovis preforms are shown in sequence excavated at bottom of photograph.

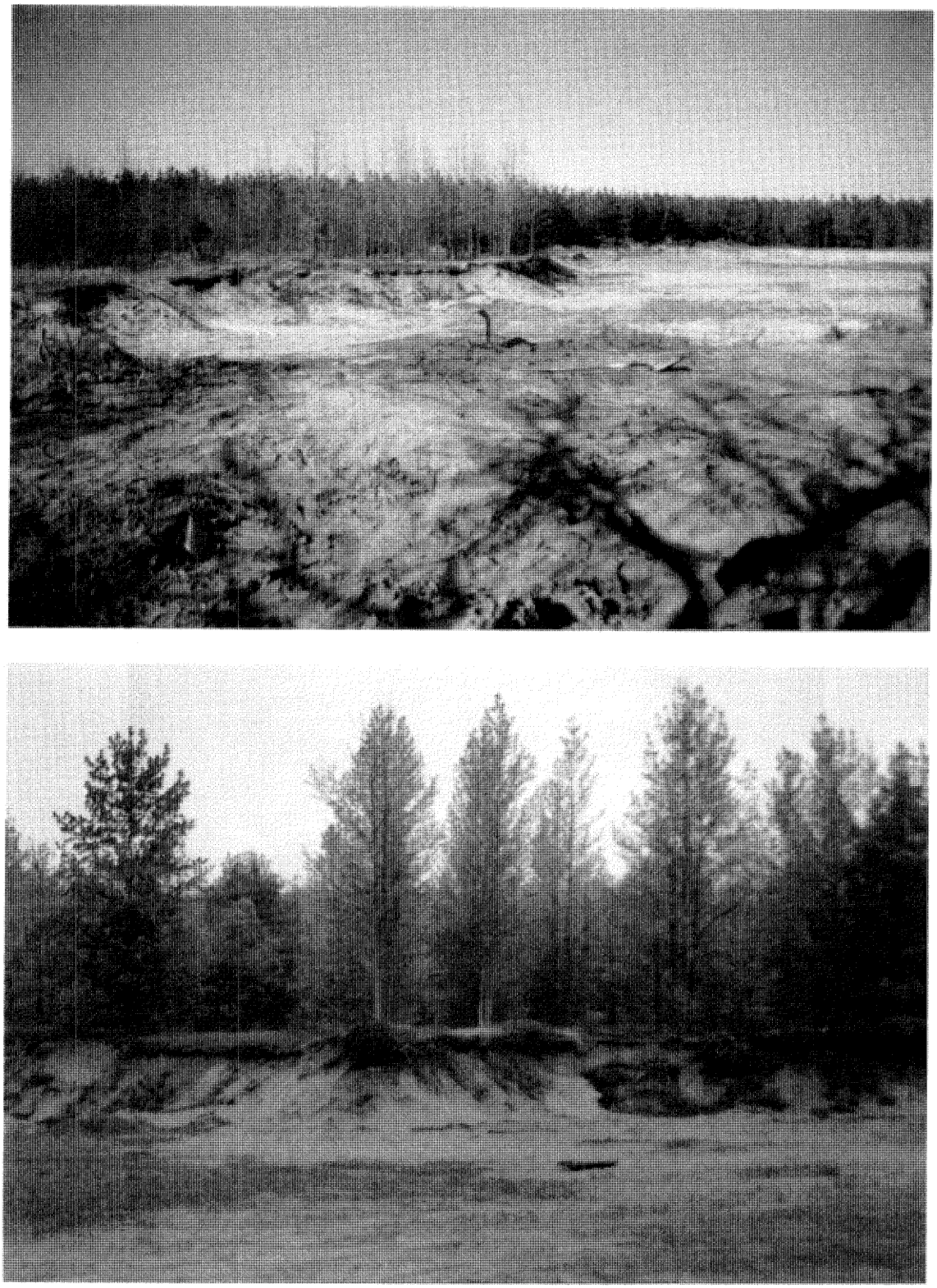


Figure 28. The remaining part of excavation area D of the Cactus Hill Site as it appeared in 1996. Top photograph, wide area view of area D in background, March 1996; bottom photograph, closer view of area D in May 1996.

APPENDIX A

PROJECTILE POINT DESCRIPTION AND ANALYSIS
CACTUS HILL SITE, EXCAVATION AREA B

Type 1, Large Triangle; n=1, Quartzite

A medium to large unnotched triangular biface manufactured directly from a flake, primarily by soft percussion with minor pressure retouch. Flakes are wide and shallow, drawn at very low angle into the blade. Often flakes hinge leaving sharp rises in the blade medial ridge location. The blade is normally excurvate to straight, and the base is concave to straight. Length: 40 mm to 60 mm; width: 20 mm to 35 mm; and thickness: 4 mm to 6 mm. This type upon the Nottoway is almost exclusively made from cobble quartzite. The cultural period is Late Middle Woodland to Late Woodland. The type is rare on Cactus Hill and may represent a hafted knife or unnotched Potts point preform.

Type 2, Thin Side Notched; n=1, Quartzite

A small to medium, shallow side notched hafted biface. This point was based upon a triangular preform which was manufactured exactly as the type 1, Large Triangle (above). The blade is normally excurvate, and the base straight to slightly concave. Notches are elongated and shallow, and often pressure flaked from alternate edges. Length: 25 to 45 mm; width: 20 to 30 mm; and thickness: 4 to 6 mm. This type upon the Nottoway is made from cobble quartzite and fine grain metavolcanic materials such as silicified rhyolite and silicified volcanic sediment (silicified slate). The cultural period is Middle Woodland to Late Woodland. This type is similar to the Potts point identified by McCary (1953) from the Potts Site on the lower Chickahominy River in New Kent County, Virginia.

Type 3, Tapered Stemmed; n=1, Quartzite

A small to medium, thick, crudely flaked tapered stem projectile point. This point was manufactured from a flake by direct soft percussion with minor or no pressure retouch. Flakes are wide and deep often hinging rather than carrying across the blade, producing a crude, stepped flake appearance. The tapered stem is elongated and irregular to short and fairly symmetrical. Length: 25 to 45 mm; width: 15 to 20 mm; thickness: 6 to 10 mm. This type upon the Nottoway is made of quartzite, poor quality rhyolite, layered and poorly silicified local materials, and soft argillite. The cultural period is Middle Woodland, and this point is found with Stony Creek cord marked pottery. This type somewhat resembles the Rossville and Piscataway point types identified further to the north (Ritchie 1961; and Stephenson et al. 1963 respectively).

Type 4, Fishtailed; n=1, Quartzite

A medium to large elongated stem projectile point with slightly expanding concave base. There is a distinctive "fishtailed" appearance to the basal form, similar to the Orient Fishtail (Ritchie 1958) from the Northeast. This point was carefully manufactured from a narrow elongated preform by a combination of soft percussion and pressure flaking. Flakes smoothly overlap at the central ridge producing a thick oval cross section. The margins of the elongated stem and basal concavity are ground or smoothed. Length: 50 to 75 mm; width: 20 to 25 mm; thickness: 7 to 10 mm. This type upon the Nottoway is made of quartzite, quartz, and rhyolite. The stone materials are often of high quality and colorful. This point type resembles not only the Orient Fishtail noted above but also exaggerated subtypes within the Halifax group (Coe 1964). This type is rare on all but a few sites on the Nottoway. The cultural period in this region is unknown, but may be transitional Late Archaic to Early Woodland.

Type 5, Perkiomen; n=1, Rhyolite

A small to large, stemmed, wide hafted biface probably used both as a projectile point and knife. The blade edges are excurvate and the point shape and stem placement is often asymmetrical. This point is based upon a large oval or pentagonal biface preform. The flaking is wide and shallow soft percussion with some pressure

retouch around the base. The flakes are at low angle into the blade producing an essentially flat cross section. Flakes generally overlap near the center of the wide blade. Most of these points of chert or jasper were made upon thermally altered flakes or preforms, and pressure flake scars are often glossy or waxy in appearance. Length: 25 to 75 mm; width: 25 to 60 mm; thickness: 3 to 7 mm. This type upon the Nottoway is made of chert, chalcedony, jasper, rhyolite, silicified slate (sediment), quartzite, and silicified wood. Most frequently, Cattail Creek chalcedony, Bolster's Store chalcedony, and speckled blue or black rhyolite were employed. The cultural period is transitional Late Archaic, and these points are associated with thin, well made soapstone bowls, some quite small in size. The type was identified by John Witthoft in 1953 from sites in Pennsylvania.

Type 6, Island Swamp; n=2, Quartzite

A large to very large, wide, tapered stem knife or projectile point. This point was excavated *in situ* in 1984 by the Nottoway River Survey (NRS) on the Fannin Site, 44SX14, six miles upriver from Cactus Hill, on the northern slope of the site over Island Swamp. The point has excurvate blade edges with an elongated tapered stem. Basal stem margins are often smoothed by abrasion. This point type was manufactured by soft percussion with little or no pressure retouch. The flakes are very wide and overlap at the center of the blade. The cross section is oval and often very symmetrical. Length: 50 to 175 mm; width: 40 to 100 mm; thickness: 7 to 15 mm. This type upon the Nottoway is made of cobble quartzite and rhyolite. The rhyolite is usually a coarse blue or green variety and is not a local material. The cultural period is the transitional Late Archaic to Early Woodland. On the Fannin Site these points were excavated just below Middle Woodland Stony Creek cord marked pottery but above broad blade Savannah River points. The apparent age is 3,000 B. P. to 3,900 B. P. This type is fairly rare in the Nottoway drainage, but it has been noted to be quite common on the James, and Chickahominy drainage 50 miles to the north, and in the Dismal Swamp to the east. It appears to be one of the terminal forms within the broad spear tradition, and may be associated with soapstone bowls on the Nottoway.

Type 7, Small Stemmed; n=21, Quartzite=14, Quartz=4, Rhyolite=2, Argillite=1

A small stem base projectile point much like the Bare Island type 10, but smaller in all details. The blade is narrow and thick with steep flakes giving the point and oval cross section. The stem is normally squared and about as wide as long. This point was manufactured by soft percussion and pressure retouch on the stem and tip. Often the discard forms show a steep edge angle from resharpening. While this point type was not excavated *in situ* in area D at Cactus Hill, it was found *in situ* in 1983 by the NRS on the Fannin Site, 44SX14, six miles up river. Length: 25 to 45 mm; width: 18 to 23 mm; and thickness: 5 to 10 mm. Upon the Nottoway, this type often was made of cobble quartzite and quartz, but many examples have been recovered of the metavolcanic materials including silicified slate, rhyolite, and argillite. On the Fannin Site this point type was excavated above broad blade Savannah River points. Although similar in form to the Bare Island type, they were not recovered in Bare Island point clusters on Cactus Hill. The Iddins type, ca. 3,500 B. P. reported by Chapman (1981) from the Iddins Site on the Little Tennessee drainage is a very similar form. The cultural period is the transitional Late Archaic.

Type 8, Savannah River Wide Blade (Broad Spear); n=15, Quartzite

This hafted biface form was defined by Coe (1964) from work on the Doerschuk Site and the Gaston Site in the North Carolina Piedmont. The examples from Cactus Hill are identical to those reported by Coe from the Gaston Site in Halifax County, North Carolina. They are somewhat smaller than those from the Doerschuk Site. A large, wide, stemmed knife or projectile point with an excurvate blade, square to slightly sloping shoulders and straight to concave stem base. The preform shape was a large, wide lanceolate. Flakes were drawn by direct soft percussion and are wide and irregular. The cross section is fairly oval, and there is little or no pressure retouch. Length: 50 to 105 mm; width: 35 to 60 mm; and thickness: 7 to 12 mm. More than 95 percent of these artifacts recovered on the Nottoway River are of local cobble quartzite. The metavolcanics and quartz account for the remaining five percent. The cultural period is Late Archaic and dates reported by other researchers cluster around 4,000 B. P.

Type 9, Savannah River Narrow Blade; n=24, Quartzite

This artifact is similar in general shape to type 8, Wide Blade, but the blade is normally thinner and more narrow. Overall, the point is shorter. Many of these points are quite thin and well made by careful soft percussion and some pressure retouch. Primary flake scars are wide and shallow. Coe (1964) made no distinction between the wide and narrow forms, but upon the Nottoway the two forms normally do not occur in the same features. Preforms are lanceolate with concave bases. Length: 45 to 95 mm; width: 20 to 35 mm; thickness: 6 to 10 mm. Upon the Nottoway this point is normally made from cobble quartzite. The cultural period is Late Archaic, and upon the Slade Site the type was dated 4,070 +/- 80 B.P. in 1988 by the NRS. This type may be slightly earlier here than the wide blade variety.

Type 10, Bare Island; n=22, Quartzite=18, Quartz=3, Rhyolite=1

A narrow, medium to large, stem base projectile point or knife, fairly thick with an oval cross section. The stem is square and normally straight across the base. The shoulders are normally square. These points were manufactured by soft percussion with pressure retouch on the tip and around the base. The blade edge flake angle is steeper than observed with the narrow blade Savannah River. Length: 50 to 80 mm; width: 18 to 25 mm; thickness: 8 to 12 mm. Upon the Nottoway, these points were made from quartzite, quartz, rhyolite, silicified slate (sediment), and argillite. The associated cultural period here is the Late Archaic, probably between 4,000 B. P. and 4,300 B. P., but there are no radiocarbon dates from the Nottoway. The general type was identified by Ritchie (1961).

Type 11, Slade; n=13, Quartzite

A medium size, wide projectile point or knife with an expanding and usually concave base. The blade is normally straight with a decided alternate edge bevel, chipped from the right side with the tip upward. This results in the beveled edge being visible on the left edge. The resharpening strategy was to keep the edge straight as opposed to an incurvate blade edge bevel strategy observed with several Early Archaic point types. The flaking was accomplished by broad soft percussion with pressure retouch on the base and blade. The basal edges are often ground, and a common trait is very heavy grinding on the shoulders or barbs. Length: 45 to 75 mm; width: 28 to 40mm; thickness: 6 to 12 mm. The cultural period is the Late Archaic, but this temporal placement is not based upon radiocarbon dating. The point is similar in shape to the Buffalo Expanding Stem reported by Broyles (1976) from Putnam County, West Virginia, except the Slade point has a concave base stem. These points were first excavated by the NRS on the Slade Site in 1985. The point type is named for that site.

Type 12, Lamoka-like; n=2, Quartzite

A medium size projectile point with shallow elongated notches and an expanding stem with a convex base. The cross section is a thick oval. These points were crudely made by soft percussion and little or no pressure retouch. The edges of notches and the basal region are abraded. Length: 40 to 70 mm; width: 18 to 24 mm; thickness: 8 to 12 mm. Upon the Nottoway, these points are made of quartzite and rhyolite, with quartzite representing over 90 percent of the total. The cultural period appears, from excavated data on the Slade Site, to be the Late Archaic approximately 4,500 B. P., but this is not based upon radiocarbon dating. The similar Lamoka point was dated by Ritchie (1965) on the Lamoka Lake Site in New York to approximately 4,500 B. P.

Type 13, Halifax; n=36, Quartzite=31, Quartz=5

This point type was defined by Coe (1964) from work on the Gaston Site in Halifax County, North Carolina. The points recovered on the Nottoway are very similar to those reported by Coe, except the favored stone material on the Nottoway was quartzite rather than quartz. This type is a medium size side notched projectile point with straight blade edges. The edges of notches and the base are usually well abraded. These points were manufactured by soft percussion and pressure retouch, resulting in a thick, symmetrical oval cross

section. The examples of quartz are usually smaller than those of quartzite. Length: 30 to 70 mm; width: 17 to 28 mm; thickness: 8 to 11 mm. Upon the Nottoway, these points are made of quartzite, quartz, rhyolite, and silicified slate (sediment). The cultural period is transitional Late Middle Archaic to Late Archaic. Numerous hearth and pit features have been radiocarbon dated upon the Nottoway which are considered to be of Halifax age. Most dates fall between 4,850 B. P. and 5,500 B. P.

Type 14, Rowan; n=11, Quartzite=10, Quartz=1

This point is similar to some forms of the Halifax type (13 above) except that for the Rowan point the notches are deeper, and there is a more "squared" appearance to the base which is wider. The basal region is more frequently concave in the Rowan type, and heavily ground on the margins. The overall dimensions are the same for both types except the Rowan point may be as wide as 30 mm. The manner of manufacture appears the same for both, but the Rowan type on the Nottoway is more frequently manufactured of metavolcanic materials. This type appears to be more common in the North Carolina Piedmont than Coastal Plain Virginia. The name Rowan is in common usage for this projectile point type by avocational archaeologists and collectors in Virginia and North Carolina. The age of this point has not been established by radiocarbon dating, but upon the Nottoway they have been excavated in only Middle Archaic contexts. The point shape, thickness, materials and manufacturing characteristics are typical of Middle Archaic forms in the Middle Atlantic region. A date of around 5,500 B. P.

Type 15, Guilford; n=84, Quartzite=54, Quartz=16, Silicified Slate=1, Rhyolite=3, Argillite=3, Layered Silicified Sediment=7

A small to large, narrow, lanceolate projectile point with a straight, round, or concave base. Cross section is thick oval to diamond shaped. Some examples have faint shoulders above the basal end. Manufacturing technique varies considerably with available stone materials. With good quality quartzite, quartz, and metavolcanic materials, these points were made by a combination of soft percussion and pressure retouch. Many points were manufactured of poor quality argillite and layered silicified materials by splitting large thin fragments from bipolar tabular (layered) cores. The thin fragments were then shaped by soft percussion, pressure flaking, or edge snapping into final shape. Most examples have abraded basal margins. Length: 30 to 100 mm; width: 17 to 25 mm; thickness: 5 to 12 mm. This point was defined by Coe (1964) from work on the Doerschuk Site in the Piedmont of North Carolina. The Nottoway River examples of this point type show considerably more flexibility in flaking technique and choice of lithics than noted by Coe for the Doerschuk Site examples, but are more similar to his examples from the Gaston Site on the Roanoke River to the south. There is no radiocarbon date for this Middle Archaic point type on the Nottoway, or from North Carolina. The suggested temporal placement based upon relative position in excavations is greater than 5,500 B. P. to perhaps 6,200 B. P. The shouldered form may date as late as approximately 5,000 B.P., based on one radiocarbon date from Cactus Hill for a feature which may have been associated with this type of Guilford point.

Type 16, Morrow Mountain II; n=107, Quartzite=90, Quartz=7, Rhyolite=1, Argillite=8, Other=1

A small to large, narrow, tapered stem projectile point with excurvate to straight blade edges. The stem is narrow and elongated, and the cross section is thick, oval, and symmetrical. The basal margins are well smoothed, as are the shoulders and a short distance of the blade above the shoulders. These points were well made by a combination of soft percussion and pressure flaking. Many quartzite examples are reddened from exposure to fire, but it is unclear that any intentional thermal alteration was employed in the manufacturing process. Length: 35 to 80 mm; width: 18 to 30 mm; thickness: 6 to 10 mm. Upon the Nottoway, these points were most frequently made of local cobble quartzite, but non-local metavolcanic materials such as the rhyolites and argillites also were used. The truly poor quality materials, sometime used by the Guilford people, generally were not employed by the Morrow Mountain II people. The cultural period is Middle Archaic, and a single radiocarbon date for a feature with a small Morrow Mountain II point from the Slade

Site was 6,470 +/-90 B. P. Overall, a time span of 6,200 B.P. to 6,800 B.P. is suggested. This type was first identified and named by Coe (1964) from work on the Doerschuk Site in the Piedmont of North Carolina. On the Nottoway River, the Morrow Mountain II point seems to be associated with tubular bannerstones and possibly with flaked or ground adz blades.

Type 17, Morrow Mountain I; n=33, Quartzite=7, Quartz=9, Rhyolite=1, Chert (Fall Line)=9, Argillite=7

A small, tapered stem projectile point with straight blade edges and a flat to oval cross section. The stem is much shorter and wider on the Morrow Mountain I variety than observed on the Morrow Mountain II variety, imparting almost a diamond shape to some greatly resharpened examples. Many of the chert points were made upon thermally altered flakes, and there is an indication that even fine grain cobble quartzite was heated prior to use. The basal margins are unabraded, to lightly abraded on some examples. Flaking was by soft percussion followed by fine pressure retouch. Starting flakes may have been derived from bipolar cores and small cobbles reduced by bipolar techniques. The soft percussion flakes on points were drawn at low angle into the blades and may reflect the use of an anvil in the flaking process. Some blade edges are serrated, but this is a rare trait. Length: 17 to 40mm; width: 15 to 30 mm; thickness: 3 to 6 mm. Upon the Nottoway, several materials were favored for these points: Cobble quartzite, chert, cobble quartz, and a soft argillite. The chert and argillite appear to have been quarried in the Fall Zone and elsewhere in the Piedmont. Cherts from the Bolster's Store and Cattail Creek quarries (McAvoy 1992) have been identified. There is probably a single source of the argillite, as most of the points weather in the same manner and to the same color and texture. The cultural period is Middle Archaic, and there is one date from area A-B at Cactus Hill of 6,700 +/- 130 B. P.for the Morrow Mountain I. The likely time span is approximately 6,700 or 6,800 B. P. to 7,100 B. P. based upon other know dates for Morrow Mountain II and Stanly. This point was first identified and placed in proper stratigraphic sequence by Coe (1964), and dated by Chapman (1979) on the Howard Site on the Little Tennessee River.

Type 18, Stanly; n=9, Quartzite=6, silicified Slate (Sediment)=1, Argillite=1, Layered Silicified Material=1

A medium to large stem base point with straight to incurvate blade edges. The stem is comparatively narrow and the base concave to decidedly notched. The point is wide at the shoulders which usually are heavily ground on the margins. The stem margins also are ground on some examples. A few examples have serrated edges, but these tend to blend into Kirk Serrated points (type 20). Many of these points found on the Nottoway, and made of quartzite, are deep red in color from exposure to heat. The few Stanly points known from this area made of Fall Line chert have been thermally altered and also are deep red. The process of thermal alteration of lithic material was known to the Stanly people as well as the Morrow Mountain I people who closely followed them. These points were made from large oval preforms which were flaked by soft percussion. The points were finished by fine pressure flaking in the notches and around the shoulders and tip. Length: 40 to 80 mm; width: 28 to 55 mm; thickness: 7 to 10 mm. Upon the Nottoway, these points were made of quartzite, silicified slate (sediment), argillite, quartz, chert, and layered silicified materials. The cultural period is the Middle Archaic, and one radiocarbon date obtained by the NRS from the Slade Site associated with Stanly period artifacts was 7,420 +/- 160 B. P. This point was first identified by Coe (1964) on the Doerschuk Site.

Type 19, Small Stanly-like; n=3, Quartzite=2, Quartz=1

A small projectile point similar to the Stanly type (18). These points seem to warrant a separate type description on the Nottoway River as they are unusually small and thin and do not seem to simply represent a resharpened form. They are not found in clusters of typical Stanly artifacts. The stems are often very narrow and notched, but the overall point size is no larger than a large LeCroy point (type 23). They were made by soft percussion and pressure flaking, and are normally made only of quartz or quartzite. Length: 28 to 35 mm; width: 20 to 25 mm; thickness: 4 to 6 mm. None has been observed to be made of thermally altered

materials. The cultural period is the Middle Archaic and the type may just precede or just follow Stanly. It is also possible that this point type may be a local variant of the Kanawha (Broyles 1971), type 22.

Type 20, Kirk Serrated; n=20 Quartzite=14, Quartz=1, Silicified Slate=1, Rhyolite=4

A medium to large stem base projectile point or knife with serrated edges. The base may be either straight or concave, the shoulders are usually square, and the serrations on some examples are deep. The margins of the basal area are ground on some examples, although the shoulders are serrated and may not be ground on reworked points. Some of these points were resharpened by alternate edge beveling of the blade edges. Held tip up, the beveled edge on most examples is seen on the right, and the blade may appear incurvate. Flaking was by soft percussion and pressure retouch of the blade edges, base, and shoulder areas. Most of these points were well made, and many are fairly thin with a symmetrical oval cross section. Length: 40 to 100 mm; width: 20 to 30 mm; thickness: 5 to 10 mm. Upon the Nottoway, these points are made of quartzite, quartz, rhyolites, highly silicified metavolcanics, and silicified slate (sediment). Overall, on many sites a high percentage are of the metavolcanic materials. The cultural period is the Middle Archaic, but this is not based upon radiocarbon dating by the NRS. Blanton and Pullins (1994) appear to have dated the type near the Virginia/North Carolina line on the Nottoway, at approximately 7,700 B. P. This is consistent with our placement of the point at about 8,000 B. P. The type was first identified by Coe (1964) on the Hardaway Site.

Type 21, Sharp's Mill - Kirk Serrated; n=3, Chert

This is a medium size distinctive subtype within the general Kirk Serrated type. It is similar to type 20 in shape, but it is thicker and most examples are made of heat treated Fall Line chert. Some examples have a notched Stanly-like base. Overall, this subtype is so distinctive it has been designated the Sharp's Mill type, based upon the Sharp's Mill Site (44SX137) on the Nottoway where it was first found in sufficient numbers to recognize it as a type. The stem and shoulders are slightly less distinctive on many Sharp's Mill points than on the typical Kirk Serrated. They were made from heat treated chert bifaces or flakes by soft percussion with minor pressure retouch on the blade edges and serrations. The serrations are usually finer than observed with the Kirk Serrated. Many examples have little or no abrasion of the margins around the base. Length: 35 to 60 mm; width: 25 to 35 mm; thickness: 8 to 12 mm. Most of these points on the Nottoway are made of thermally altered red-brown Bolster's Store chert. The cultural period is the Middle Archaic, probably from 7,400 to 7,800 B. P. The type was excavated *in situ* on the Fannin Site, Slade Site, and Cactus Hill. There are no radiocarbon dates for this type.

Type 22, Kanawha-like; n=3, Quartzite=1, Quartz=2

A small, expanding stem, notched base projectile point with serrated edges. The basal margins are abraded on some examples. This point has some characteristics of the Kanawha point defined by Broyles (1971) on the St. Albans Site. This is a rare form on the Nottoway River. It was made by soft percussion and extensive pressure retouch on the base and serrations on the blade edges. Length: 28 to 38 mm; width: 23 to 27 mm; thickness: 4 to 6 mm. Examples on the Nottoway are made of quartzite, quartz, metavolcanics, and chert. There is no date for this type on the Nottoway, and it has not been excavated here in good stratigraphic context.

Type 23, LeCroy; n=9, Quartz=7, Silicified Slate (Sediment)=2

A small stem base point with a deeply notched (bifurcate) base and deeply serrated blade edges. The notch is narrow, and many examples have well formed square shoulders. On some, basal margins are abraded. Most examples on the Nottoway are made of good grades of white quartz and are thin and well flaked. These points were made from small oval bifaces by soft percussion, or they were pressure flaked directly from large thin flakes. Length: 15 to 35 mm; width: 15 to 25 mm; thickness: 3 to 6 mm. Upon the Nottoway, these points were made of white quartz, silicified slate (sediment), rhyolite, quartzite, crystal quartz, and chert in roughly that order of preference. The period is transitional (late) Early Archaic or the early part of the Middle Archaic,

based upon the position of the researcher. The points were first dated by Broyles (1971), from work on the St. Albans Site, at 8,300 B. P. On the Slade Site the points were dated 8,300 +/- 110 B. P. in 1986 by the NRS.

Type 24, St. Albans; n=18, Quartzite=3, Quartz=1, Silicified Slate (Sediment)=7, Rhyolite or Tuff=6, Chert=1

A small to medium size bifurcate base projectile point with moderate to well formed shoulders and a serrated blade edge. These points have a fairly large basal notch angle as compared to the LeCroy point (type 23) and on some examples the stem has a lobate appearance. These points are thin and well made from the better grades of metavolcanic materials. The manufacturing process was skillful, soft percussion followed by extensive pressure retouch around the basal notch, shoulders, and serrated blade. Length: 30 to 50 mm; width: 23 to 32 mm; thickness: 4 to 7 mm. Upon the Nottoway, these points are most frequently made of nonlocal highly silicified metavolcanic materials which must have been obtained at distances of 50 miles or more from this area. The use of local cobble quartzite and quartz was minimal. The cultural period is the later part of the Early Archaic. Associated artifacts are crude end scrapers, well made unifacial side scrapers and flake knives, and flaked adz and celt blades with ground cutting edges (bits). St. Albans projectile points occur at almost the same depth in the stratified deposit, in area D at Cactus Hill, as do Fort Nottoway points (type 27) which are dated at approximately 8,750 to 9,000 B. P. A single isolated hearth feature in area B at Cactus Hill was associated with six Fort Nottoway points and two St. Albans points. The two types, therefore, probably overlap to some degree in age with the Fort Nottoway type slightly older on the Nottoway. The St. Albans point was identified by Broyles (1971) from work on the St. Albans Site on the Kanawha River in West Virginia.

Type 25, Kirk Stemmed; n-10, Quartzite=4, Quartz=5, Rhyolite=1

A medium to large expanding stem projectile point or knife, with variable shoulders and a straight or incurvate serrated blade. Some points have a straight base, while other are slightly concave or convex. Some examples have barbed shoulders, but others have straight to sloping shoulders. Serrations are usually fine in comparison to the Kirk Serrated point (type 20). These points were make by soft percussion, followed by pressure flaking around the stem and serrated blade edges. The basal region is usually thinned by removal of several parallel flakes. Length: 45 to 75 mm; width: 25 to 40mm; thickness: 6 to 10 mm. Upon the Nottoway, these points are normally made of quartzite, quartz, and the silicified metavolcanic materials. While some of these points are probably greatly resharpened Corner Notched Kirks, others appear to be an early stage in the transition of the Corner Notched Kirk to a stemmed or bifurcate form. It is also possible that some rare forms of the Kirk Serrated (type 20) may approach the shape of the Kirk Stemmed. These points were excavated in area D at Cactus Hill above Palmer and below St. Albans. The cultural period is the Early Archaic and a temporal placement of 8,700 B. P. is most likely on the Nottoway River. The type was defined by Coe (1964) from work on the Hardaway Site. This point is similar to the later Kirk Serrated type and the two are often confused by researchers.

Type 26, Kirk Side-Notched; n=2, Quartzite

A medium to large, narrow projectile point with elongated side notches of variable depth and a straight to incurvate serrated blade edge. The base is usually straight, but may be slightly convex or concave. This point type is probably a resharpened form of the Kirk Corner-Notched (type 30) or the Kirk Stemmed (type 25), and may be a common variant of both of these two types. It is unclear that this type exists as a unique cultural marker, since multiple finds of the type seldom occur around a single archaeological feature. These points were made by soft percussion followed by extensive blade modification by pressure flaking. Some examples have steep blade edges and large serrations indicative of extensive resharpening. Length: 45 to 80 mm; width: 21 to 26 mm; thickness: 6 to 10 mm. Upon the Nottoway, this type is normally made of quartzite or the metavolcanic materials. A few examples of quartz are known. The cultural period is the Early Archaic at about the Fort Nottoway (type 27) time period, but later than Decatur (type 28). This suggests a time span of

8,700 to 9,000 B. P. These points were excavated *in situ* in area D at Cactus Hill at the same level with Fort Nottoway points, and the late variant of the Kirk Corner-Notched type.

Type 27, Fort Nottoway; n=32, Quartzite=31, Jasper=1 (Area D produced 15 others, 12 Quartzite, 1 Quartz, 1 Rhyolite, 1 Chert or Rhyolite)

A medium to large, square base, side notched projectile point with beveled and serrated blade edges. The cross section is flat rhomboid to oval and very symmetrical. The base is usually slightly concave, but may be straight. The blade on most examples is incurvate but recurved toward the tip. This blade shape is a result of the resharpening strategy from an initial blade shape which is excurvate without bevel or serrations. The side notches are narrow and fairly deep on most examples, with the notches incised into the base parallel to the basal concavity. Most examples slope inward, or constrict, at the base, which is a result of the pentagonal shape of the preform. The basal region and notches are heavily ground on most examples. Serrations are small and associated with the beveling flakes. These points are almost always resharpened with the alternate edge beveled side showing to the left with the tip upward. Basal regions may be well thinned by one or two long longitudinal flakes up the blade face on one side. The flaking technique was soft percussion, removing wide and thin parallel biface reduction flakes. The points were finished with extensive pressure retouch around the base, notches, and on the blade edges. Length: 45 to 100 mm; width: 25 to 50 mm; thickness: 4 to 8 mm. Upon the Nottoway, most of these points are made of the high quality gray, blue, and brown quartzites, but a few examples have been reported of quartz, rhyolite, chert, jasper, and green silicified slate. The cultural period is the Early Archaic, and the two radiocarbon dates obtained by the NRS for this type on Cactus Hill are 8,800 +/- 120 B. P. and 8,920 +/- 65 B. P. The most likely time range is 8,750 B. P. to 9,000 B. P. These points are associated with unifacial tools such as end scrapers, side scrapers, and worked flake knives. Chipped celts and adz blades, and large bifacial serrated knives are found on their working surfaces. Thick, heavy gravers and wedges also occur with these points. These points were named for the Fort Nottoway Site about 9 mile upriver from Cactus Hill, where the type was defined by the NRS.

Type 28, Decatur; n=9, Quartzite=4, Rhyolite=2, Silicified Slate=2, Chert=1 (Area D produced 19, Quartzite=14, Oolitic Quartzite=1, Highly Silicified Black Rhyolite=2)

This point, which is sometimes called Angelico (Painter 1964) in Virginia, was first described by Cambron (1957) from sites near Decatur, Alabama. The Decatur is a small to medium corner notched, or expanded stem projectile point with a straight or concave base and a straight or incurvate alternate edge beveled and serrated blade. The points are very thin with a parallel or rhomboid cross section. The basal margins and notches are very heavily ground, and rarely on a Virginia example the basal margins may be flattened or burinized by removal of the entire edge with one or two cross-edge flakes. Most of the Alabama examples are made of fine cherts and have burinized basal margins, but the Virginia examples are often of inferior materials and usually lack this distinctive trait. The shoulders are often barbed as a result of resharpening, and the barbs may slope toward the base, tip or extend straight out from the blade. The alternate edge blade bevel may be to either left or right, but is more frequently observed on the left with the tip upward. Some examples of this point type blend into the Palmer Corner-Notched type (31a). Length: 22 to 57 mm; width: 18 to 32 mm; thickness: 3 to 6 mm. Upon the Nottoway, these points are most frequently made of fine grain quartzite, silicified rhyolite, silicified slate, and quartz, and rare examples are made of chert, jasper, black (mountain) flint, and oolitic quartzite. The cultural period is the Early Archaic, and upon Cactus Hill this type dated 9,140 +/- 50 B. P. An estimated time range for the type is 9,000 B. P. to 9,250 B. P. This point is associated with a well made concave base triangular knife, drills, unifacial end scrapers, side scrapers, worked flakes, and wedges. The tool types are very similar to those associated with the Palmer points (type 31a and b).

Type 29, Plevna; n=0 (Area D of Cactus Hill produced 2, Silicified Sediment=1, Quartzite=1)

This is the only point type from Cactus Hill which was recovered in area D of the site and not in area B. The Plevna, as defined on the Nottoway, is a side notched projectile point with a round base which is marginally ground. These points have straight, incurvate, or slightly excurvate serrated blade edges, and they are thin and well made. The cross section is oval. There is a faint trace of beveling on a few examples. The notches are narrow, but fairly deep, and are ground. Flaking was accomplished by broad wide soft percussion flakes followed by pressure retouch around the base to form the notches.and the serrations. Length: 35 to 60 mm; width: 22 to 30 mm; thickness: 4 to 7 mm. Upon the Nottoway this rare point form is most often made of green silicified slate (sediment), but some are quartzite. The cultural period is the Early Archaic, and the type has been excavated *in situ* on the Slade Site and area D on Cactus Hill. The temporal placement seems to be 8,800 to 9,200 B. P. The type was defined from points found on the Plevna Site in Madison County, Alabama (DeJarnette, Kurjack, and Cambron 1962).

Type 30, Kirk Corner-Notched; n=15, Quartzite=7, Quartz=1, Silicified Slate (Sediment)=2, Silicified Rhyolite or tuff=4, Chert=1

A small to large, thin, and well made, corner notched projectile point or knife with straight to slightly concave or slightly convex base. The blade edges may be straight, incurvate, or excurvate and vary considerably with resharpening. The blade is rarely beveled, but resharpened examples are usually serrated. The cross section is oval and usually symmetrical. The notches may be shallow or deep, and the notches are usually elongated as compared to the Palmer (type 31). On some examples the base may be fairly long or extended. On most examples the shoulders, or barbs, are wider than the base unless there has been extensive resharpening where the barbs may have been eliminated. For the Nottoway River examples, the basal margins and notches normally are at least lightly abraded and may be heavily abraded or even ground smooth. A few rare examples have no abrasion of basal margins or notches. Kirk Corner-Notched points were made by a combination of well controlled soft percussion and fine pressure retouch around the margins. Length: 32 to 100 mm; width: 20 to 50 mm; thickness: 5 to 10 mm. Upon the Nottoway, these points are made of the better grades of highly silicified metavolcanic materials and of fine grain quartzites. A few examples are made of quartz, and a rare example is made of chert or jasper. The cultural period is the Early Archaic, and this type appears to have been of long duration being reported by researchers from about 9,400 B. P. (Chapman 1977, 1985) to 8,850 B. P. (Broyles 1971). This type on the Nottoway has been recovered in excavations below Decatur (9,140 +/- 50 B. P.) to above or with Fort Nottoway (8,800 +/- 120 B. P.). On the Nottoway, the older forms appear to have deeper, more narrow notches, and they have heavier abrasion or grinding of basal margins and notches. The older forms are sometime referred to as "Large Palmers", or "Lower Kirk" by some researchers. The type was first identified by Coe (1964) on the Hardaway Site.

Type 31, Palmer; n=24, Quartzite=17, Silicified Slate=1, Rhyolite=1, Chert and Jasper=5

A small to medium thin and well made corner notched projectile point which occurs in two primary forms. Subtype 31a has a straight or slightly concave base which is heavily ground on the margins. The notches are diagonal from the corners and are well abraded on the margins. This may be the older of the two forms. Subtype 31b has a distinctive convex base which is heavily ground smooth on the margins. The corner notches are almost perpendicular to the blade on some examples producing a somewhat "side-notched" appearance to the point, especially when it has been resharpened and the barbs reduced in size. It was noted in areas B and D on Cactus Hill that the two projectile point forms are mutually exclusive on some working surfaces. This adds credibility to the argument that there is a cultural or temporal distinction between the forms. Both point types have oval cross sections and excurvate or straight blade edges which are serrated. The notches are narrow and deep, but tend to lose the "barbed" appearance as the points are resharpened. The width of the base tends to more closely equal the width of barbs on the Palmer type than on the Kirk Corner-Notched. These points were manufactured by pressure flaking from small triangular preforms which were made by well controlled soft percussion. Occasionally, these points were made by pressure flaking directly

from thin flakes. Length: 25 to 50 mm; width: 20 to 35 mm; thickness: 3.5 to 6 mm. Upon the Nottoway, these points are normally made of fine grain quartzite, chert, or jasper. They are occasionally made of quartz and crystal quartz, and rarely made of the metavolcanics. Other than quartzite, the lithic choices for Palmer points are quite different than noted for Corner-Notched Kirks. The cultural period is the Early Archaic, but there are no radiocarbon dates for this type on the Nottoway. They were excavated below Decatur points in Area D at Cactus Hill and must date prior to 9,140 +/- 50 B. P. A temporal placement on the Nottoway River of approximately 9,200 B. P. to 9,600 B. P. seems reasonable. The type was first identified by Coe (1964) on the Hardaway Site.

Type 32, Deep Notched (Palmer); n=3, Highly Silicified Slate (Sediment)=1, Highly Silicified Rhyolite or Tuff=1, and Jasper=1 (Area D produced 2 examples, and area A (test square) produced 1 example, all fine grain quartzite)

The Deep Notched (Palmer) type is very similar to the Palmer type 31a, except the point is larger, the basal area is usually heavily ground on the margins, and the notches are deeper and more narrow. This type most closely resembles the Charleston Corner-Notched points (9,900 +/- 500 B. P.) defined by Broyles (1971) from the lowest levels on the St. Albans Site in West Virginia. It also resembles the Early Archaic corner notched form recovered by Benthall (1979) from the lowest level of Daugherty's Cave in Russell County, Virginia, which dated 9,840 +/- 400 B. P. These points on the Nottoway were very carefully flaked by a combination of soft percussion followed by delicate pressure flaking around the entire margins and in the notches. Length: 30 to 65 mm; width: 25 to 35 mm; thickness: 5 to 8 mm. Upon the Nottoway this type is made of the better grades of quartzite and the highly silicified metavolcanics. Jasper was rarely used. The cultural period is the earliest part of the Early Archaic, and a suggested temporal placement on the Nottoway River is approximately 9,500 B. P. to 10,500 B. P. There are no radiocarbon dates for this type in this area, and the Deep-Notched Palmers have been excavated by the NRS *in situ* only in area D at Cactus Hill, and one example was excavated on the Slade Site three miles upriver. These points are rare on the Nottoway River.

Type 33, Hardaway Side-Notched; n=1, Silicified Rhyolite (Three other examples are known from Cactus Hill, 1 other from area B and 2 from area A, Silicified Rhyolite=1, Chert-like=1, unknown fire-cracked silicified material (wood?)=1)

A small to medium, very thin side-notched triangular projectile point with a flat cross section and a concave base. The examples from the Nottoway River area have straight to excurvate blade edges and more shallow basal concavities than some of the forms from the North Carolina Piedmont. The notches are fairly shallow and u-shaped, and the basal concavity and notches are unabraded to lightly abraded. Some examples were well thinned from the basal concavity by pressure flaking. These points were made by pressure flaking from very thin triangular bifaces. The bifaces were made by carefully controlled soft percussion, usually from large flakes of highly silicified metavolcanic materials or jasper. Approximately 50 of these points have been observed from artifact collections in the Nottoway River drainage. Length: 20 to 50 mm; width: 20 to 35 mm; thickness: 3 to 5 mm. Upon the Nottoway River, these points are made of highly silicified metavolcanic slates (sediments), rhyolites, and tuffs, jasper, chert-like layered materials, silicified wood, and orthoquartzite (oolitic quartzite). The cultural period is the transitional Late Paleoindian or very earliest part of the Early Archaic. These points were excavated by the NRS *in situ* on the Slade Site, three miles upriver from Cactus Hill, and were recovered below all corner notched Palmer and Kirk points. There are no acceptable radiocarbon dates for these points in Virginia or North Carolina, but based on the excavated position on the Slade Site the suggested temporal placement is 10,000 to 10,200 B. P. This type was first identified by Coe (1964) on the Hardaway Site.

Type 34, Dalton-like; n=2, Quartzite=1, Rhyolite=1

A medium size, pentagonal shaped projectile point of knife with parallel sided or expanding basal edges, and a concave base. The blade edges are incurvate and resharpened. Neither example is beveled or serrated. Both examples were abraded in the basal concavity and along the margins of basal edges. Both examples are resharpened from larger lanceolate bifacial forms. Manufacturing technique appears to have been soft percussion with little pressure retouch. It is unclear that either of these points is a true example of the Late Paleoindian Hardaway Dalton point type which is know throughout North Carolina. Only a few classic Hardaway Dalton points are known from the Nottoway, and most of these are made of highly silicified metavolcanic materials. One example found near the Cactus Hill Site is of Bolster's Store green chert. Length: 40 to 70 mm; width: 22 to 30 mm; thickness: 5 to 6 mm; This is a Late Paleoindian projectile point first described by Coe (1964) from the Hardaway Site. Suggested temporal placement is 10,000 to 10,500 B. P.

Type 35, Middle Paleoindian (?) Fluted Projectile Points; n=3, Jasper=1, Chert-like Rhyolite=1, Crystal Quartz=1 (Area B produced 1 other point, and area A produced 1 other point, Orthoquartz=1, Highly Silicified Rhyolite or Tuff=1)

Middle Paleoindian fluted points from Cactus Hill generally follow four subtypes as follows: Subtype 35a: a small, thin triangular fluted projectile point with a deeply concave base and excurvate blade edges. Probably a resharpened form of subtype 35b. Subtype 35b: a medium to large, thin, parallel sided fluted projectile point with deeply concave base. The blade is excurvate. Subtype 35c: a small, thin waisted or "fishtail" base fluted projectile point with multiple flute scars. The blade is excurvate, and the basal concavity is shallow to moderate depth. Subtype 35d: this point may belong in type 36, Clovis. It is a thin, well made point with single, long, wide flute scars on each face. The basal concavity is moderate to deep. All of the points in type 35 share the traits of being quite thin, having different unusual features such as deeply concave basal concavities, waisted "fishtail" basal areas, single long flutes on each face, and all are made of stone materials which are foreign to the Nottoway River drainage. Like most Virginia fluted points, all of these points have ground basal margins. Some of these types are more commonly identified with traditions in the Northeast which date to approximately 10,600 B. P. Dimensions will not be given here as all of the Middle Paleoindian fluted points were reported individually in the main text of the Cactus Hill report. The following is the number of known examples of each type from Cactus Hill: 35a=2, 35b=1, 35c=1, 35d=1. Forms similar to 35c and 35d are known from the Williamson Site in Dinwiddie County, Virginia, 12 miles to the northwest.

Type 36, Clovis Fluted Projectile Points; n=1, Quartz (Area B has produced 3 other examples and Area A has produced 1 other example; Chert=3, Metavolcanic Silicified material (?)=1)

Clovis fluted projectile points from Cactus Hill generally follow two subtypes as follows: Subtype 36a is a large, thick, heavy parallel sided projectile point or knife with excurvate blade tip, and ground basal edge margins. Fluting was accomplished by removal of one or multiple flutes probably by soft percussion. Flake work is primarily soft percussion with pressure retouch around the margins. Subtype 36b is identical except that the blade expands from the basal region to mid length. The blade is excurvate. Both point types on Cactus Hill are manufactured of local stone materials including Fall Line cherts (Williamson and Mitchell quarry cherts) and white quartz. One broken tip of a Clovis (?) is made of a weathered, green metavolcanic material of unknown origin. The Clovis types on Cactus Hill are not found in clusters with the assumed Middle Paleoindian fluted types. Also, the Clovis types are generally larger and about 1-1/2 times as thick as the Middle Paleoindian fluted types. Clovis points are made of local cherts and cobble (?) quartz while the other points are made of high quality lithics foreign to the Nottoway. Dimensions are not given here as they are given for all Clovis points (except one) in the main text of the Cactus Hill report. A Clovis tool cluster and hearth on Cactus Hill produced a radiocarbon date of 10,920 +/- 250 B. P. The Clovis type has been dated by Haynes (1984) in the Southwest to as early as 11,200 to 11,500 B. P.

Type 37, Early Triangular (Trianguloid/Lanceolate); n=2, Rhyolite

A small to medium, thin, triangular (trianguloid/lanceolate) projectile point with a concave base and excurvate blade edges. The cross section is relatively flat, and the basal margins are lightly abraded or unabraded. Flaking was accomplished by soft percussion with little or no pressure retouch. Basal regions were thinned. One resharpened example approaches a pentagonal shape. Length: 30 to 50 mm; width: 20 to 30 mm; thickness: 4 to 5 mm. Upon the Nottoway, these points are made of highly silicified metavolcanic materials such as rhyolite and slate (sediment), and very fine grain quartzite or metaquartzite. The cultural period is Paleoindian, and may be Early Paleoindian from the excavated position in area B on Cactus Hill where this type was recovered *in situ* below Clovis. Not enough occurrences have been documented in an excavated context to clearly establish a relative age for these points and there are no radiocarbon dates, but the type may date to 12,000 B. P. or older. This type is similar to some of the examples of the Hardaway blade identified and shown by Coe (1964) as being recovered from the lowest levels of the Hardaway Site. It is also possible that both of the examples from Cactus Hill are greatly resharpened remnants, and that the earlier stage of this artifact form is much more lanceolate in shape. However, three other good examples of this type known from Nottoway River sites are about the same size and shape as the two Cactus Hill points recovered by NRS.

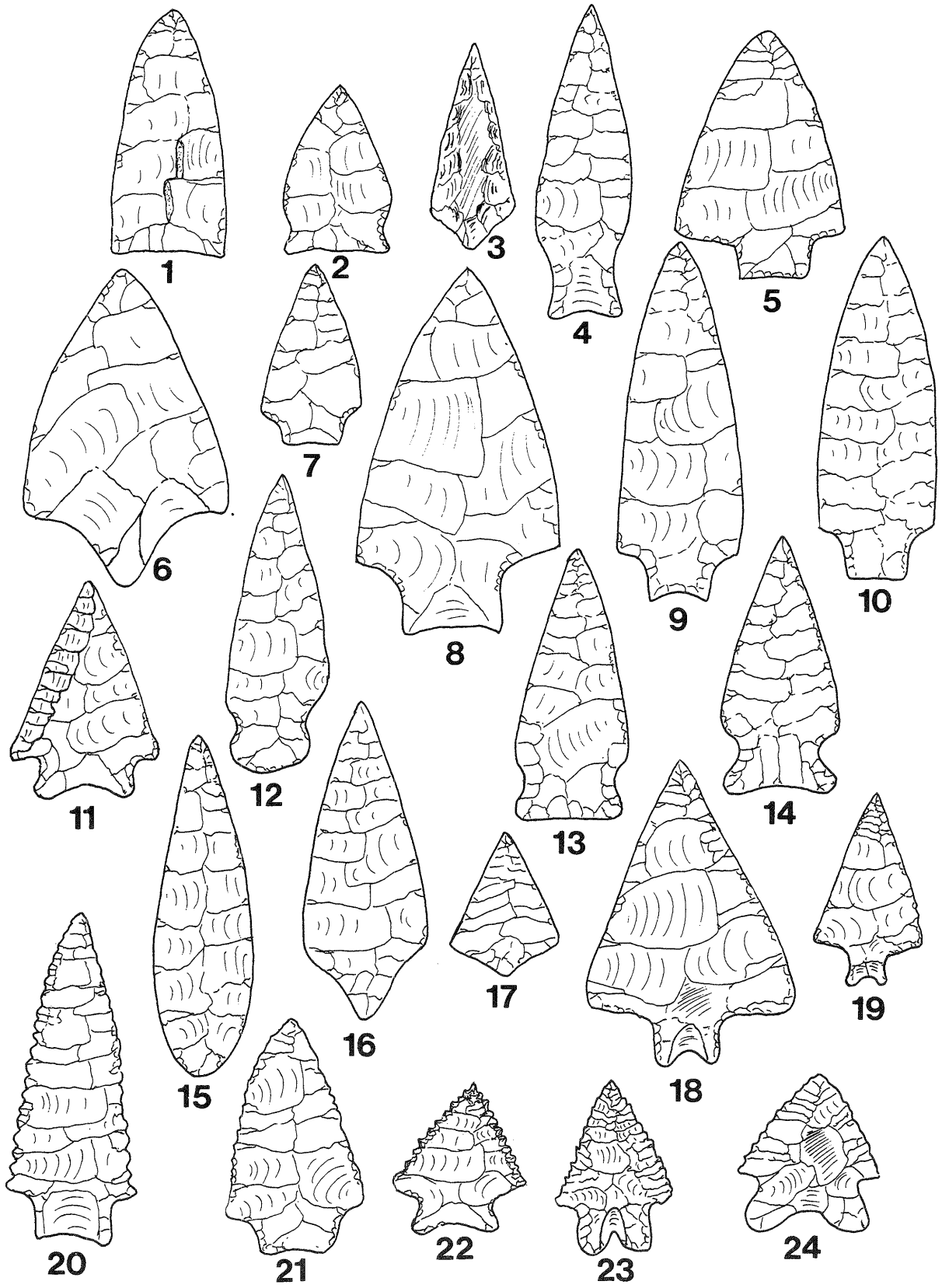


Figure 1. Projectile point types 1 through 24.

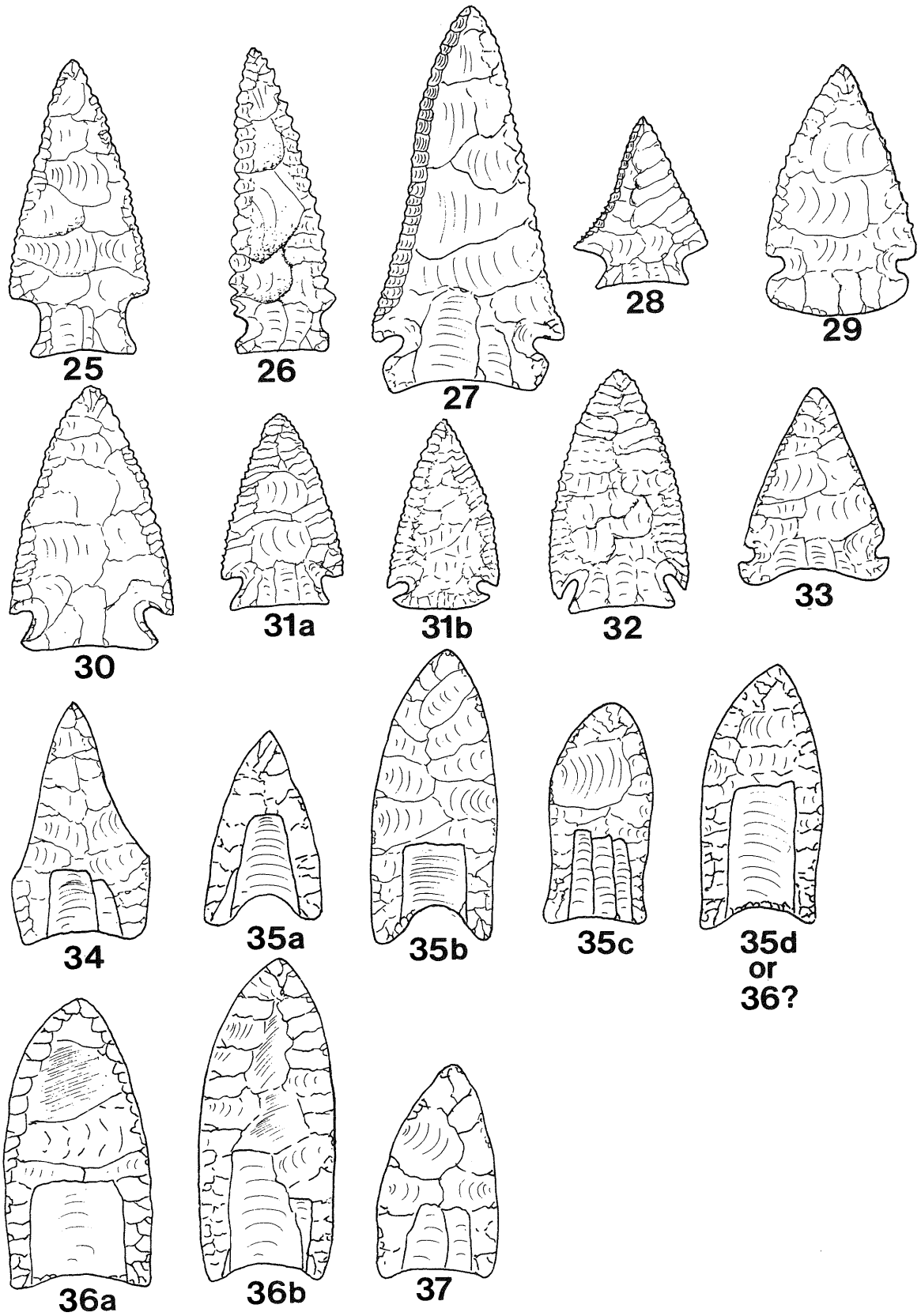


Figure 2. Projectile point types 25 through 37.

Sequence of Tables for
Excavation Units Cactus Hill, Area B

Lithic Material Symbols In Tables

Qe=quartzite
Qu=quartz
S=silicified slate (silicified sediment or tuff)
Ry=rhyolite or silicified rhyolite
Ch=chert
Ar=argillite
Jr=jasper (normally listed under chert)
Ld=layered siliceous material

Table 1. UNIT 0/0

CACTUS HILL 44SX202, AREA B, SQUARE 0/0, LEVELS 1- 9 (NO DIAGNOSTICS 1, AND 5-9), DEPOSIT DEPTH INCHES 6 + 21EX = 27, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 2 - LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS								LEVEL 4- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-W	1							1																
Savannah R-N	1							1	1							1								
Halifax									1							1								
Guilford																	1							1
Morrow Mt. II																	1							1
TOTAL	2							2	2							2	2							2

Table 2a. UNIT 0/14

CACTUS HILL 44SX202, AREA B, SQUARE 0/14, LEVELS 1-4, DEPOSIT DEPTH INCHES 6 + 16EX = 22, EXCAVATED 4/94, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Island Swamp									2							2								
Small Stemmed		1						1	4							4								
Savannah R-W	1							1																
Savannah R-N									1							1								
Bare Island									1	1						2								
Halifax	1							1																
Rowan									2							2	2							2
Guilford									3	1				1		5								
Morrow Mt. II									7					1	1	9	1							1
Morrow Mt. I									1	1						2		1			1			2
Kanawha-like									1							1								
St. Albans																	1							1
Fort Nottoway																	1							1
Kirk C-N (Early ?)																								
Dalton-like																	1							1
TOTAL	2	1						3	22	3				2	1	28	6	1			1			8

Table 2b. UNIT 0/14

CACTUS HILL 44SX202, AREA B, SQUARE 0/14, LEVELS 1-4, DEPOSIT DEPTH INCHES 6 + 16EX = 22, EXCAVATED 4/94, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC ARTIFACTS	LEVEL 4 - LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS None								LEVEL 6- LITHIC MATERIALS N/A							
	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Island Swamp																								
Small Stemmed																								
Savannah R-W																								
Savannah R-N																								
Bare Island																								
Halifax																								
Rowan																								
Guilford																								
Morrow Mt. II																								
Morrow Mt. I	1							1																
Kanawha-like																								
St. Albans																								
Fort Nottoway	1							1																
Kirk C-N (Early ?)	1							1																
Dalton-like																								
TOTAL	3							3																

Table 3. UNIT 0/16

CACTUS HILL 44SX202, AREA B, SQUARE 0/16, LEVELS 1,2, AND 5, (NO DIAGS. IN 3,4, AND 6) , DEPOSIT DEPTH INCHES 6 + 18EX = 24, EXCAVATED 11/ 7/93 , BY OTHERS

DIAGNOSTIC ARTIFACTS	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS							
	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-N	1							1	1							1								
Halifax	1							1																
Rowan									1							1								
Morrow Mt. II	2			1				3	1							1								
Stanly									1							1								
St. Albans			1					1																
Fort Nottoway									2							2								
Kirk C-N			1					1	1							1								
Palmer C-N									1							1	1							1
TOTAL	4		2	1				7	8							8	1							1

Table 4a. UNIT 0/1

CACTUS HILL 44SX202, AREA B, SQUARE 0/1, LEVELS 1 - 8 (NO DIAGNOSTICS 5 AND 8), DEPOSIT DEPTH INCHES 6 + 24EX = 30, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-W																	1							1
Slade	1							1																
Halifax									1							1								
Guilford		1						1	1							1								
Morrow Mt. II	1							1									1	1						2
St. Albans																								
Palmer C-N																								
TOTAL	2	1						3	2							2	2	1						3

Table 4b. UNIT 0/1

CACTUS HILL 44SX202, AREA B, SQUARE 0/1, LEVELS 1 - 8 (NO DIAGNOSTICS 5 AND 8), DEPOSIT DEPTH INCHES 6 + 24EX = 30, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS								LEVEL 6- LITHIC MATERIALS								LEVEL 7- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-W																								
Slade																								
Halifax																								
Guilford									1							1								
Morrow Mt. II	3	1						4	2							2								
St. Albans																				1				1
Palmer C-N									1							1								
TOTAL	3	1						4	4							4				1				1

Table 5. UNIT 0/20

CACTUS HILL 44SX202, AREA B, SQUARE 0/20, LEVELS 1 - 3, DEPOSIT DEPTH INCHES 9 + 12 EX = 21, EXCAVATED 3/7/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-N	1							1																
Slade	1							1																
Halifax	1							1									1							1
Rowan	2	1						3																
Guilford	1		1					2																
Small Stanly-like	1							1																
Sharps Mill/K-S					1			1																
Fort Nottoway									1							1	1							1
Kirk C-N												1				1								
Palmer C-N									1							1								
TOTAL	7	1	1		1			10	2			1				3	2							2

Table 6a. UNIT 0/4

CACTUS HILL 44SX202, AREA B, SQUARE 0/4, LEVELS 1-5, DEPOSIT DEPTH INCHES 8 + 16EX = 24, EXCAVATED 4/5/92, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC ARTIFACTS	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Small Stemmed	1							1																
Round Base S-N (?)	1							1																
Guilford						2	1	3	2							2								
Morrow Mt. II																	1							1
Morrow Mt. I	1	1						2																
Fort Nottoway																								
Palmer C-N																					1			1
TOTAL	3					2	1	7	2							2	1				1			2

Table 6b. UNIT 0/4

CACTUS HILL 44SX202, AREA B, SQUARE 0/4, LEVELS 1- 5, DEPOSIT DEPTH INCHES 8 + 16EX = 24, EXCAVATED 4/5/92, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC ARTIFACTS	LEVEL 4 - LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS None								LEVEL 6- LITHIC MATERIALS N/A							
	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Small Stemmed																								
Round Base S-N (?)																								
Guilford																								
Morrow Mt. II	1							1																
Morrow Mt. I																								
Fort Nottoway	1							1																
Palmer C-N																								
TOTAL	2							2																

Table 7a. UNIT 0/5

CACTUS HILL 44SX202, AREA B, SQUARE 0/5, LEVELS 1- 9, DEPOSIT DEPTH INCHES 6 + 22EX = 28, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS None								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Small Stemmed																	1							1
Savannah R-W																								
Slade																								
Halifax																								
Rowan																	1							1
Guilford		1						1									4							4
Morrow Mt. II																	1							1
Morrow Mt. I																								
LeCroy																								
Kirk Stemmed																								
Fort Nottoway																								
Decatur																								
Palmer C-N																								
Mid Paleo Fluted																								
TOTAL		1						1									7							7

Table 7b. UNIT 0/5

CACTUS HILL 44SX202, AREA B, SQUARE 0/5, LEVELS 1- 9, DEPOSIT DEPTH INCHES 6 + 22EX = 28, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS								LEVEL 6- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Small Stemmed	1							1																
Savannah R-W																								
Slade	2							2																
Halifax		1						1	1							1								
Rowan																								
Guilford	2							2																
Morrow Mt. II	2							2	3							3								
Morrow Mt. I						1		1						1		1	1				1			2
LeCroy		1						1																
Kirk Stemmed									2							2								
Fort Nottoway																								
Decatur																					1			1
Palmer C-N																	1							1
Mid Paleo Fluted																					1 Jr.			1
TOTAL	7	2				1		10	6					1		7	2				3			5

Table 7c. UNIT 0/5

CACTUS HILL 44SX202, AREA B, SQUARE 0/5, LEVELS 1- 9, DEPOSIT DEPTH INCHES 6 + 22EX = 28, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC ARTIFACTS	LEVEL 7 - LITHIC MATERIALS None								LEVEL 8- LITHIC MATERIALS None								LEVEL 9- LITHIC MATERIALS							
	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Small Stemmed																								
Savannah R-W																	1							1
Slade																								
Halifax																								
Rowan																								
Guilford																								
Morrow Mt. II																								
Morrow Mt. I																								
LeCroy																								
Kirk Stemmed																								
Fort Nottoway																	1							1
Decatur																								
Palmer C-N																								
Mid Paleo Fluted																								
TOTAL																	2							2

Table 8a. UNIT 0/8

CACTUS HILL 44SX202, AREA B, SQUARE 0/8, LEVELS 1 - 6, DEPOSIT DEPTH INCHES 6 + 18EX = 24, EXCAVATED 6/8/91, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC ARTIFACTS	LEVEL 1 - LITHIC MATERIALS								LEVEL 2 - LITHIC MATERIALS								LEVEL 3 - LITHIC MATERIALS							
	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-N	2							2																
Bare Island	3							3	2							2								
Guilford									3							3			1					1
Morrow Mt. II									2							2								
Morrow Mt. I													1											
LeCroy																								
St. Albans																								
Kirk Stemmed																								
Decatur																								
Kirk C-N									1							1								
Palmer C-N																								
TOTAL	5							5	8				1			8			1					1

Table 8a. UNIT 0/8

CACTUS HILL 44SX202, AREA B, SQUARE 0/8, LEVELS 1 - 6, DEPOSIT DEPTH INCHES 6 + 18EX = 24, EXCAVATED 6/8/91, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS								LEVEL 5 - LITHIC MATERIALS None								LEVEL 6 - LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-N																								
Bare Island																								
Guilford																								
Morrow Mt. II																	2							2
Morrow Mt. I																								
LeCroy		3						3																
St. Albans			1					1																
Kirk Stemmed	1		1					2																
Decatur																								
Kirk C-N																								
Palmer C-N	1							1																
TOTAL	2	3	2					7									2							2

Table 9a. UNIT 1/11

CACTUS HILL 44SX202, AREA B, SQUARE 1/11, LEVELS 1-10 (NO DIAGNOSTICS 7-10), DEPOSIT DEPTH INCHES 8 + 18EX = 26, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Small Stemmed																								
Savannah R-W	1							1																
Slade									1							1								
Halifax																								
Guilford									1							1								
Morrow Mt. II	2	1						3									2							2
Morrow Mt. I						1		1																
St. Albans																								
Palmer C-N																	1							1
TOTAL	3	1				1		5	2							2	3							3

Table 9b. UNIT 1/11

CACTUS HILL 44SX202, AREA B, SQUARE 1/11, LEVELS 1-10 (NO DIAGNOSTICS 7-10), DEPOSIT DEPTH INCHES 8 + 18EX = 26, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC ARTIFACTS	LEVEL 4 - LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS								LEVEL 6- LITHIC MATERIALS							
	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Small Stemmed	1							1										1						1
Savannah R-W																								
Slade																								
Halifax	1							1																
Guilford	1							1																
Morrow Mt. II																								
Morrow Mt. I						1		1																
Kirk Serrated									1							1								
St. Albans																	1							1
Palmer C-N																								
TOTAL	3					1		4	1							1	1	1						2

Table 10a. SALV. EX. B

CACTUS HILL 44SX202, AREA B, SQUARE SAL. B, LEVELS 1- 6, DEPOSIT DEPTH INCHES 8+18 EX = 26, EXCAVATED 5/28/94, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC ARTIFACTS	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Small Stemmed				2				2	2							2								
Savannah R-N	3							3	2							2								
Halifax	1							1									1							1
Rowan	1							1	1	1						2								
Guilford	4	2		1				7	1	2		1			3 Ld	7		1						1
Morrow Mt. II	7							7	4					1		5	1					1		2
Morrow Mt. I	1					2		3																
Kirk Serrated											1					1				1				1
LeCroy																		1						1
Kirk Stemmed																								
Decatur																								
Kirk C-N	1 ?							1																
Palmer C-N																	1							1
Palmer D-N													1 Jr			1								
Clovis																								
Early Triangular																								
TOTAL	18	2		3		2		25	10	3	1	1	1	1	3	20	3	2		1		1		7

Table 10b. SALV. EX. B

CACTUS HILL 44SX202, AREA B, SQUARE SAL. B, LEVELS 1- 6, DEPOSIT DEPTH INCHES 8+18 EX = 26, EXCAVATED 5/28/94, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS								LEVEL 6- LITHIC MATERIALS None							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Small Stemmed																								
Savannah R-N																								
Halifax																								
Rowan																								
Guilford																								
Morrow Mt. II																								
Morrow Mt. I																								
Kirk Serrated																								
LeCroy																								
Kirk Stemmed	2							2																
Decatur				1				1																
Kirk C-N																								
Palmer C-N																								
Palmer D-N			1					1																
Clovis		1						1																
Early Triangular												1				1								
TOTAL	2	1	1	1				5				1				1								

Table 11a. UNIT 2/11

CACTUS HILL 44SX202, AREA B, SQUARE 2/11, LEVELS 1- 10 (NO DIAGNOSTICS 9-10), DEPOSIT DEPTH INCHES 8 + 20EX = 28, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Unknown Stemmed.										1						1								
Savannah R-N	1							1																
Bare Island	1							1	1							1	1							1
Slade	1							1	1							1								
Halifax																	2							2
Guilford									1							1								
Morrow Mt. II									2							2	2							2
Morrow Mt. I																								
Kirk Serrated																				1				1
Fort Nottoway																								
Decatur																								
Kirk C-N																								
Palmer C-N	1							1																
TOTAL	4							4	5	1						6	5			1				6

Table 11b. UNIT 2/11

CACTUS HILL 44SX202, AREA B, SQUARE 2/11, LEVELS 1-10 (NO DIAGNOSTICS 9-10), DEPOSIT DEPTH INCHES 8 + 20EX = 28, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS								LEVEL 5 - LITHIC MATERIALS None								LEVEL 6 - LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Unknown Stemmed.																								
Savannah R-N																								
Bare Island																								
Slade																								
Halifax																								
Guilford																								
Morrow Mt. II	1							1																
Morrow Mt. I																		1			1			2
Kirk Serrated																								
Fort Nottoway																	1							1
Decatur																								
Kirk C-N																	1							1
Palmer C-N																	1							1
TOTAL	1							1									3	1			1			5

Table 11c. UNIT 2/11

CACTUS HILL 44SX202, AREA B, SQUARE 2/11, LEVELS 1- 10 (NO DIAGNOSTICS 9-10), DEPOSIT DEPTH INCHES 8 + 20EX = 28, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 7 - LITHIC MATERIALS								LEVEL 8 - LITHIC MATERIALS								LEVEL 9 - LITHIC MATERIALS None							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Unknown Stemmed.																								
Savannah R-N																								
Bare Island																								
Slade																								
Halifax																								
Guilford																								
Morrow Mt. II																								
Morrow Mt. I	1							1					1			1								
Kirk Serrated									1							1								
Fort Nottoway																								
Decatur									1							1								
Kirk C-N																								
Palmer C-N																								
TOTAL	1							1	2				1			3								

Table 12. UNIT 2/16

CACTUS HILL 44SX202, AREA B, SQUARE 2/16, LEVELS 1- 3, DEPOSIT DEPTH INCHES 6+12EX = 18, EXCAVATED 3/21/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-W	1							1																
Savannah R-N	2							2																
Bare Island	1			1				2																
Morrow Mt. II	2							2	2							2	2							2
Morrow Mt. I										1						1								
LeCroy										2						2								
TOTAL	6			1				7	2	3						5	2							2

Table 13a. UNIT 2/12

CACTUS HILL 44SX202, AREA B, SQUARE 2/12, LEVELS 1- 6, DEPOSIT DEPTH INCHES 6 + 21EX = 27, EXCAVATED 10/18/92, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Small Stemmed	2	1						3																
Savannah R-W									1							1								
Savannah R-N	1							1														1		1
Fishtailed ?									1							1								
Elongated Stemmed?	1							1																
Halifax	1							1	2	1						3								
Guilford	2							2	2						1	3								
Morrow Mt. II									1							1	1							1
Morrow Mt. I																								
Kirk Serrated												1				1								
St. Albans																								
Kirk Stemmed																								
Kirk S-N																								
Fort Nottoway																								
Kirk C-N																								
TOTAL	7	1						8	7	1		1			1	10	1					1		2

Table 13a. UNIT 2/12

CACTUS HILL 44SX202, AREA B, SQUARE 2/12, LEVELS 1- 6, DEPOSIT DEPTH INCHES 6 + 21EX = 27, EXCAVATED 10/18/92, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS								LEVEL 6- LITHIC MATERIALS None							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Small Stemmed																								
Savannah R-W																								
Savannah R-N																								
Fishtailed ?																								
Elongated Stemmed?																								
Halifax																								
Guilford	2							2																
Morrow Mt. II	2					1		3																
Morrow Mt. I						1		1																
Kirk Serrated																								
St. Albans											1					1								
Kirk Stemmed										1						1								
Kirk S-N									1							1								
Fort Nottoway									3							3								
Kirk C-N	1							1		1		1				2								
TOTAL	5					2		7	4	2	1	1				8								

Table 14a. UNIT 2/7

CACTUS HILL 44SX202, AREA B, SQUARE 2/7, LEVELS 1- 6, DEPOSIT DEPTH INCHES 8+16 EX=24, EXCAVATED 3/8/92, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Large Triangular	1							1																
Tapered Stemmed	1							1																
Perkiomen												1				1								
Small Stemmed										1						1	1							1
Savannah R-W									2							2								
Slade	1							1	1							1								
Halifax									1							1	1	1						2
Guilford										1						1								
Morrow Mt. II																	2							2
Morrow Mt. I																								
Small Stanly-like																	1							1
Kirk Serrated																	1							1
St. Albans																								
Kirk Stemmed																								
Kirk S-N																								
Fort Nottoway																	1							1
Kirk C-N																	1			1				2
Palmer C-N																								
Early Triangular																								
TOTAL	3							3	4	2		1				7	8	1		1				10

SQUARE 2/7 LEVELS 1-3

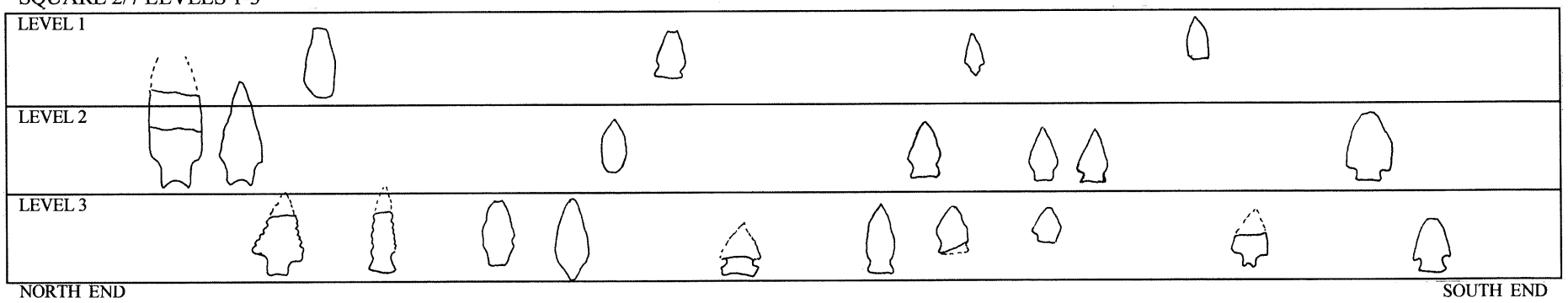


Table 14b. UNIT 2/7

CACTUS HILL 44SX202, AREA B, SQUARE 2/7, LEVELS 1- 6, DEPOSIT DEPTH INCHES 8+16 EX=24, EXCAVATED 3/8/92, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS								LEVEL 6- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Large Triangular																								
Tapered Stemmed																								
Perkiomen																								
Small Stemmed																								
Savannah R-W																								
Slade																								
Halifax	1							1																
Guilford	1							1																
Morrow Mt. II																								
Morrow Mt. I						1		1																
Small Stanly-like		1						1																
Kirk Serrated	1			1				2																
St. Albans	1							1																
Kirk Stemmed									2							2								
Kirk S-N											1					1								
Fort Nottoway																								
Kirk C-N																								
Palmer C-N													1			1								
Early Triangular																				1				1
TOTAL	4	1		1		1		7	2		1		1			4				1				1

SQUARE 2/7 LEVELS 4-6

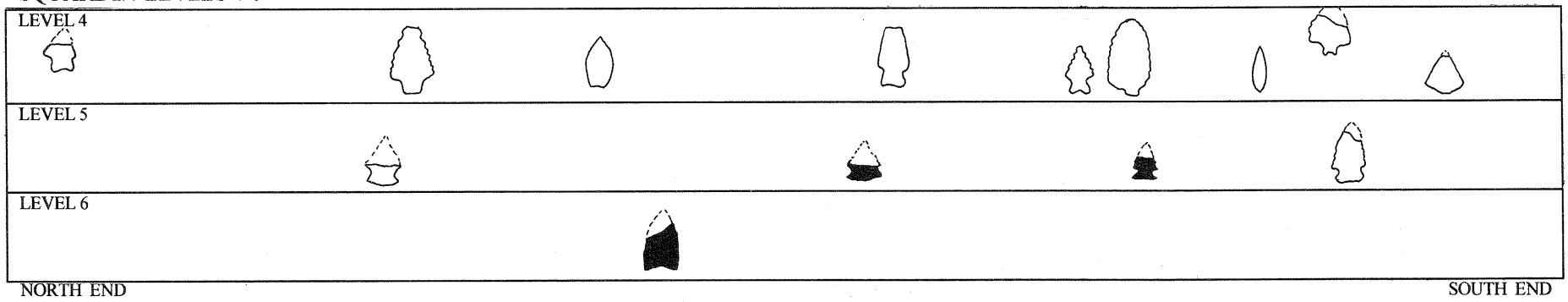


Table 15a. UNIT 1/9+ 2/9

CACTUS HILL 44SX202, AREA B, SQUARE 1/9+2/9, LEVELS 1-7, DEPOSIT DEPTH INCHES 8+22EX=30, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-W	1							1																
Savannah R-N									2							2								
Bare Island									3							3								
Slade									1							1								
Halifax									1	1						2	2							2
Guilford									2	3						5		1						1
Morrow Mt. II									6	1						7	1							1
Morrow Mt. I										1						1								
Stanly									1							1								
Kirk Serrated																	1							1
LeCroy										1						1								
St. Albans												1				1			1	1				2
Kirk Stemmed										1						1		1						1
Fort Nottoway																	1							1
Decatur																	1							1
Kirk C-N																								
Palmer C-N																	1							1
Mid Paleo Fluted																								
TOTAL	1							1	16	8		1				25	7	2	1	1				11

SQUARE 1/9+2/9 LEVELS 1-3

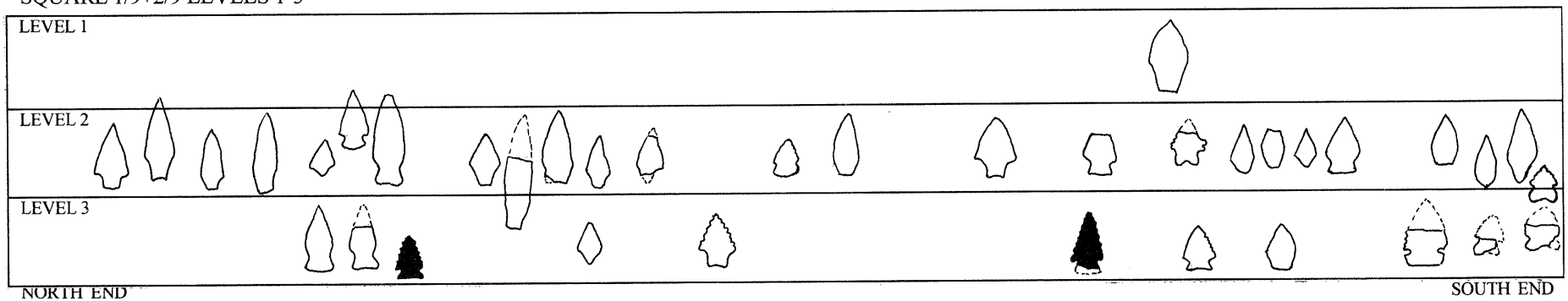


Table 15b. UNIT 1/9+2/9

CACTUS HILL 44SX202, AREA B, SQUARE 1/9+2/9, LEVELS 1-7, DEPOSIT DEPTH INCHES 8+22EX=30, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4- LITHIC MATERIALS								LEVEL 5 LITHIC MATERIALS								LEVEL 6- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-W	1							1																
Savannah R-N																								
Bare Island		1						1																
Slade																								
Halifax									1							1								
Guilford																								
Morrow Mt. II	1							1																
Morrow Mt. I					1			1	1							1								
Stanly																								
Kirk Serrated																								
LeCroy																								
St. Albans																								
Kirk Stemmed																								
Fort Nottoway																								
Decatur																								
Kirk C-N																								
Palmer C-N	2				1			3	1			1				2	1							1
Mid Paleo Fluted										1 Cl		1				2								
TOTAL	4	1			2			7	3	1		2				6	1							1

SQUARE 1/9+2/9 LEVELS 4-6

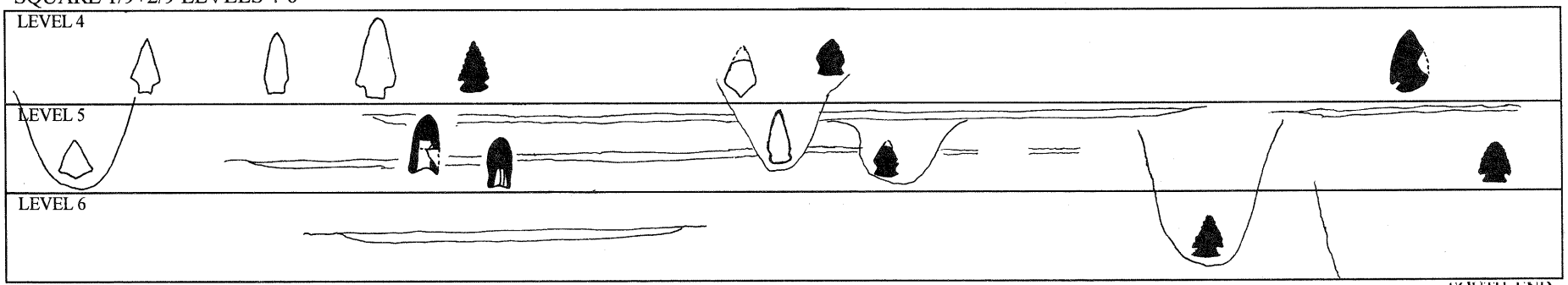


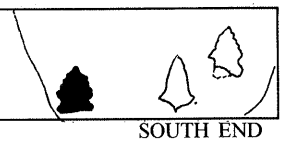
Table 15c. UNIT 1/9+2/9

CACTUS HILL 44SX202, AREA B, SQUARE 1/9+2/9, LEVELS 1-7, DEPOSIT DEPTH INCHES 8+22EX=30, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 7- LITHIC MATERIALS								LEVEL 8 LITHIC MATERIALS None								LEVEL 9- LITHIC MATERIALS None							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-W																								
Savannah R-N																								
Bare Island																								
Slade																								
Halifax																								
Guilford																								
Morrow Mt. II																								
Morrow Mt. I	1							1																
Stanly																								
Kirk Serrated																								
LeCroy																								
St. Albans			1					1																
Kirk Stemmed																								
Fort Nottoway																								
Decatur																								
Kirk C-N					1			1																
Palmer C-N																								
Mid Paleo Fluted																								
TOTAL	1		1		1			3																

SQUARE 1/9+2/9 LEVEL 7

LEVEL 7



NORTH END

SOUTH END

Table 16. UNIT 3/20

CACTUS HILL 44SX202, AREA B, SQUARE 3/20, LEVELS 1- 3 , DEPOSIT DEPTH INCHES 8+12Ex = 20, EXCAVATED 2/14/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Bare Island	1							1																
Guilford							1	1																
Kirk Serrated									2			1				3								
Sharps Mill/K-S													1			1								
Fort Nottoway																	1							1
TOTAL	1						1	2	2			1	1			4	1							1

Table 17a. UNIT 3/2

CACTUS HILL 44SX202, AREA B, SQUARE 3/2 LEVELS 1- 4, DEPOSIT DEPTH INCHES 6 + 16EX = 22, EXCAVATED 3/9/92, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Thin S-N.	1							1																
Halifax									1							1								
Rowan																								
Guilford	3							3	3							3				1				1
Morrow Mt. II	1	1						2	1	1						2								
Kirk Serrated																								
Kanawha-like	1							1																
St. Albans																								
Palmer C-N													1			1								
Hardaway S-N																								
TOTAL	6	1						7	5	1			1			7				1				1

Table 17b. UNIT 3/2

CACTUS HILL 44SX202, AREA B, SQUARE 3/2 LEVELS 1- 4, DEPOSIT DEPTH INCHES 6 + 16EX = 22, EXCAVATED 3/9/92, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS None								LEVEL 6- LITHIC MATERIALS N/A							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Thin S-N.																								
Halifax																								
Rowan	1							1																
Guilford	1							1																
Morrow Mt. II	1							1																
Kirk Serrated		1						1																
Kanawha-like																								
St. Albans		1						1																
Palmer C-N																								
Hardaway S-N				1				1																
TOTAL	3	2		1				6																

Table 18. UNIT 3/4

CACTUS HILL 44SX202, AREA B, SQUARE 3/4 LEVELS 1-3, DEPOSIT DEPTH INCHES 6 + 14 = 20, EXCAVATED 4/92, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Small Stemmed														1		1								
Guilford	1							1																
Morrow Mt. I													1			1								
Palmer C-N																	2							2
TOTAL	1							1					1	1		2	2							2

Table 19a. UNIT 4/11

CACTUS HILL 44SX202, AREA B, SQUARE 4/11, LEVELS 1- 7 , DEPOSIT DEPTH INCHES 8+19 EX = 27, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Slade	1							1																
Bare Island																	2							2
Guilford									1							1								
Morrow Mt. II									1							1	2							2
Morrow Mt. I																								
Stanly	1							1																
Decatur																								
TOTAL	2							2	2							2	4							4

Table 19b. UNIT 4/11

CACTUS HILL 44SX202, AREA B, SQUARE 4/11, LEVELS 1- 7 , DEPOSIT DEPTH INCHES 8+19 EX = 27, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS								LEVEL 6- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Slade																								
Bare Island	1							1																
Guilford	1							1																
Morrow Mt. II																								
Morrow Mt. I										1						1								
Decatur																	1		1					2
TOTAL	2							2		1						1	1		1					2

No diagnostic artifacts were recovered in Level 7.

Table 20a. UNIT 4/22

CACTUS HILL 44SX202, AREA B, SQUARE 4/22, LEVELS 1- 6, DEPOSIT DEPTH INCHES 8 + 28EX = 36, EXCAVATED 4/25/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-W	4							4																
Slade									1							1								
Halifax	1							1	1							1								
Rowan																	1							1
Guilford									2							2	1							1
Morrow Mt. II																	1							1
Morrow Mt. I																				1				1
Kirk Serrated	1							1																
Sharps Mill/K-S																					1			1
Palmer C-N																								
TOTAL	6							6	4							4	3			1	1			5

Table 20b. UNIT 4/22

CACTUS HILL 44SX202, AREA B, SQUARE 4/22, LEVELS 1- 6, DEPOSIT DEPTH INCHES 8 + 28EX = 36, EXCAVATED 4/25/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS None								LEVEL 5 - LITHIC MATERIALS								LEVEL 6 - LITHIC MATERIALS None							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-W																								
Slade																								
Halifax																								
Rowan																								
Guilford																								
Morrow Mt. II																								
Morrow Mt. I																								
Kirk Serrated																								
Sharps Mill/K-S																								
Palmer C-N												1				1								
TOTAL												1				1								

Table 21a. UNIT 4/9

CACTUS HILL 44SX202, AREA B, SQUARE 4/9, LEVELS 1 - 9 (NO DIAGNOSTICS 2,3,6,8 AND 9), DEPOSIT DEPTH INCHES 8 + 15EX = 23, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 4 - LITHIC MATERIALS								LEVEL 5 - LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Slade	1							1																
Halifax																		1						1
Guilford																								
Morrow Mt. II									1							1	2							2
Kirk Serrated																								
St. Albans																				1				1
Kirk C-N																	1							1
TOTAL	1							1	1							1	3	1		1				5

Table 21b. UNIT 4/9

CACTUS HILL 44SX202, AREA B, SQUARE 4/9, LEVELS 1 - 9 (NO DIAGNOSTICS 2,3,6,8 AND 9), DEPOSIT DEPTH INCHES 8 + 15EX = 23, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 7 - LITHIC MATERIALS								LEVEL 8 - LITHIC MATERIALS None								LEVEL 9 - LITHIC MATERIALS None							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Slade																								
Halifax																								
Guilford	1							1																
Morrow Mt. II																								
Kirk Serrated	1							1																
St. Albans																								
Kirk C-N																								
TOTAL	2							2																

Table 22a. UNIT 6/11

CACTUS HILL 44SX202, AREA B, SQUARE 6/11, LEVELS 1- 8 (NO DIAGNOSTICS 5 AND 7 - 8), DEPOSIT DEPTH INCHES 6 + 22EX = 28, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-N									1							1								
Bare Island																		1						1
Halifax	1							1																
Guilford									1							1								
Morrow Mt. II									1							1								
Stanly									1							1								
Fort Nottoway																								
Decatur																								
TOTAL	1							1	4							4		1						1

Table 22b. UNIT 6/11

CACTUS HILL 44SX202, AREA B, SQUARE 6/11, LEVELS 1- 8 (NO DIAGNOSTICS 5 AND 7 - 8), DEPOSIT DEPTH INCHES 6 + 22EX = 28, EXCAVATED 10/93, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS None								LEVEL 6- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-N																								
Bare Island																								
Halifax																								
Guilford																								
Morrow Mt. II																								
Stanly																								
Fort Nottoway																	1							1
Decatur	1							1																
TOTAL	1							1									1							1

Table 23a. SALV. EX. A

CACTUS HILL 44SX202, AREA B, SQUARE SALV. A, LEVELS 1- 5, DEPOSIT DEPTH INCHES 8 + 18EX = 26, EXCAVATED 8/6/94, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Bare Island									2							2								
Slade	1							1																
Halifax									3							3								
Guilford									2							2								
Morrow Mt. II	1							1	2					1		3	1	1						2
Morrow Mt. I					1			1					1			1		1						1
Stanly																								
Kanawha-like																		1						1
Kirk Stemmed																		1						1
Decatur																			1					1
Dalton-like																				1				1
Clovis																								
TOTAL	2				1			3	9				1	1		11	1	4	1	1				7

Table 23b. SALV. EX. A

CACTUS HILL 44SX202, AREA B, SQUARE SALV. A, LEVELS 1- 5, DEPOSIT DEPTH INCHES 8 + 18EX = 26, EXCAVATED 8/6/94, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS								LEVEL 6- LITHIC MATERIALS None							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Bare Island																								
Slade																								
Halifax																								
Guilford																								
Morrow Mt. II																								
Morrow Mt. I																								
Stanly	1							1																
Kanawha-like																								
Kirk Stemmed																								
Decatur												1				1								
Dalton-like																								
Clovis (Tools)													tool											
TOTAL	1							1				1				1								

Table 24a. SALV. EX. C

CACTUS HILL 44SX202, AREA B, SQUARE SALV. C, LEVELS 1- 5 , DEPOSIT DEPTH INCHES 8+20EX = 28, EXCAVATED 6/7/94, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-W	1							1																
Lamoka-like	1							1																
Guilford		2						2																
Morrow Mt. II	5					1		6	3					1		4								
Stanly															1 Ld	1			1					1
Kirk Serrated									3							3								
LeCroy																		1						1
St. Albans			1					1					1			1								
Kirk Stemmed									1							1								
Fort Nottoway									1							1	3							3
Kirk C-N									1							1			1	1				2
Palmer C-N																								
TOTAL	7	2	1			1		11	9				1	1	1	12	3	1	2	1				7

Table 24b. SALV. EX. C

CACTUS HILL 44SX202, AREA B, SQUARE SALV. C, LEVELS 1- 5 , DEPOSIT DEPTH INCHES 8+20EX = 28, EXCAVATED 6/7/94, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS None								LEVEL 6- LITHIC MATERIALS None							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Savannah R-W																								
Lamoka-like																								
Guilford																								
Morrow Mt. II																								
Stanly																								
Kirk Serrated																								
LeCroy																								
St. Albans																								
Kirk Stemmed																								
Fort Nottoway	2							2																
Kirk C-N																								
Palmer C-N			1					1																
TOTAL	2		1					3																

Table 25a. UNIT 0/22

CACTUS HILL 44SX202, AREA B, SQUARE 0/22, LEVELS 1- 5, DEPOSIT DEPTH INCHES 6 + 13EX, EXCAVATED 6/20/92, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 1 - LITHIC MATERIALS None								LEVEL 2- LITHIC MATERIALS								LEVEL 3- LITHIC MATERIALS							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Rowan									1							1								
Guilford															1	1								
Morrow Mt. I									1							1								
Stanly									2							2								
St. Albans																				2				2
Fort Nottoway																	2							2
Constricted Stmd. ?																	1							1
TOTAL									4						1	5	3			2				5

Table 25b. UNIT 0/22

CACTUS HILL 44SX202, AREA B, SQUARE 0/22, LEVELS 1- 5, DEPOSIT DEPTH INCHES 6 + 13EX, EXCAVATED 6/20/92, BY NOTTOWAY RIVER SURVEY

DIAGNOSTIC	LEVEL 4 - LITHIC MATERIALS								LEVEL 5- LITHIC MATERIALS None								LEVEL 6- LITHIC MATERIALS N/A							
ARTIFACTS	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.	Qe	Qu	SS	Ry	Ch	Ar	Oth.	Tot.
Rowan																								
Guilford																								
Morrow Mt. I																								
Stanly																								
St. Albans																								
Fort Nottoway	3				1 Jr.			4																
Constricted Stmd. ?																								
TOTAL	3				1			4																

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APPENDIX B

Analysis of Woodland and Historic Period Occupation at the Cactus Hill Site

by
James P. McAvoy

Introduction

This appendix summarizes the Woodland and Historic artifacts and components from the Cactus Hill Site (44SX202) in Sussex County, Virginia. The Woodland occupation is represented mostly by ceramics, while the Historic component is represented by artifacts and features dating from the early 18th century. Historic documentation of the Cactus Hill Site area is also presented.

Excavation Methods

The Cactus Hill Site has undergone recent logging and reforestation which has compromised the vertical and horizontal integrity of the top few inches of the archeological deposit. During reforestation, large piles of forest debris were pushed into rows, which are visible in an aerial photo taken in 1978 (Fig. 1.2 of main report), with heavy equipment that could have dislocated the soil over fifty feet horizontally.

Due to this disturbance and the fact that the main interest in excavating the site was devoted to the Early Archaic and Paleoindian levels, the plow zone was deemed as having little importance and was removed without screening in nearly all of the excavations. Generally, the first formally excavated layers represented the Woodland or Late Archaic time periods, meaning that some or all of the Woodland and all of the Historic artifacts were removed from most excavation units with the plowzone.

Unexpected sources of artifacts were the backdirt piles left by artifact collectors. Sifting through these piles produced a number of Historic artifacts and prehistoric sherds. Although these artifacts lack vertical provenience, they do retain a general horizontal provenience.

Unless they were from a feature, all Historic artifacts were plowzone or surface finds. The two largest Historic features (1 and 2) were excavated by artifact collectors. The artifacts from these features that appear in this report were either recovered from the artifact collectors' backdirt piles, or borrowed for analysis from the collectors that excavated the features.

In many cases there were prehistoric sherds mixed with the Late Archaic levels, or a portion of the Woodland layer was left intact below the plowzone, and this layer (Soil Zone 2, Figure 5.1 of main report) was generally a light brown color when compared with the tan colored soil of the Archaic levels. Most of the excavated Woodland sherds are from one of these contexts.

The Woodland Component

Due to a lack of stratigraphy in the Woodland stratum, the Cactus Hill Site provides no data on Woodland artifacts from a chronological point of view, but it is hoped that a detailed attribute description of the sherds will add to the database for future studies. Artifacts found on the Cactus Hill Site attributable to the Woodland period include 377 ceramic sherds, one gray slate gorget fragment, and two projectile points.

Ceramics

The 377 Woodland sherds found at the Cactus Hill Site are listed by provenience in Table 1 (for location of excavation units, see Figure 5.2A of main report, and Figure 3 of this appendix). They were divided into categories based on their temper and surface treatment. It was soon realized, however, that many of these sherds belonged to specific vessels. Out

of 377 sherds, 284 of them belong to only eight vessels. This left 93 sherds not attributed to specific vessels. These sherds were sorted by surface treatment and temper and are presented in Table 2.

The variety in the materials used to temper the Woodland vessels is small. The most common temper is quartz sand, sometimes with larger quartz pebbles, but never with crushed quartz. Only two shell tempered sherds were recovered, one of which is net impressed while the other's surface treatment is unidentifiable.

A few sherds were recovered which have crushed sherds of pottery as their temper. At the Cactus Hill Site, the crushed sherd temper was not easily recognizable and was visible in only a few sherds. In most crushed sherd tempered ceramics this author has viewed, the crushed sherds are present in poorly fired vessels and are easily recognizable by their difference in color with the rest of the paste. At the Cactus Hill Site, however, the pots were better fired and the crushed sherds welded and blended well with the rest of the paste, only becoming visible within fractures. Because of this, it is likely that some sherds with crushed sherd temper were not recognized as such. The only surface treatment found associated with this temper was cord-wrapped dowel impressed.

Surface treatments of ceramics found at the Cactus Hill Site include cord, cord-wrapped dowel, fabric, and net impressed, in order of popularity.

Careful scrutiny of the cord marked ceramics reveals a multitude of different variations based on what are currently considered subtle differences in temper, paste, exterior and interior surface treatment, decoration, color, and wall thickness. The wide variation in the ceramics placed within the Stony Creek series is testament that more refined categories may need to be generated. This will not be possible, however, until excavated data support a particular chronology.

The ceramics recovered at the Cactus Hill site are representative of Late, Middle, and Early Woodland wares. The Late Woodland period is represented by a sherd of simple-stamped Gaston Ware (Coe 1964:105-106) recovered in square 3/34, a sherd of fabric impressed Branchville Ware (Binford 1964:287-303) or Cashie Ware (Phelps 1984:48-51, Egloff and Potter 1982:109) found on the surface in area B, and a sherd of Townsend Ware (Blaker, 1963:14-22) from square 3/44. The Townsend sherd is not shell tempered, but instead has sand and some pebbles. It is apparently representative of an inner coastal plain variety of Townsend Ware similar to that mentioned by Mouer et al. (1986:145) for the fall line area of the James River drainage.

The Middle Woodland is represented by Stony Creek (Evans, 1955:69-7, Egloff and Potter 1982:99-103), Prince George (Evans 1955:60-64) and Mockley (Stephenson et al. 1963:103-109) Wares. Vessel #3 was cord marked Prince George ware, and one sherd of Mockley ware was recovered in square 3/44. Stony Creek Ware was common throughout the site.

The sherds possibly representing the Early Woodland period at the Cactus Hill site are sherd tempered cord-wrapped dowel impressed.

Eight groups of sherds identifiable as belonging to single vessels have been identified. These are presented in Table 3, where many categories are used to describe the vessels. Most categories are self-explanatory, but some require further explanation. Within the "vessel" column is a number arbitrarily assigned to a group of five or more sherds that were seen by the author as likely representing a single vessel. The "twist" column is the final twist direction of the cordage used to apply the surface treatment. The twist direction exhibited on the sherds was seen as a negative and was reversed to ascertain the actual twist direction as presented in Table 3.

Out of the 377 sherds recovered, 284 of them, or 75%, can be assigned to only eight vessels. This, along with the fact that many of the vessels are not likely contemporaneous, indicates that the area of the site investigated was not a large or long term camp, but was more likely an infrequently reoccupied temporary camp during the Woodland period. Another possibility is that the area investigated represents the outskirts of larger, longer term camps closer to the river. Because only limited sampling was done in that area, this scenario remains to be proved or disproved.

Table 1: Woodland Artifacts Recovered by Provenience

Provenience	Artifacts
4/22 W	2 vessel #1 sherds 1 vessel #6 sherd 2 cord/sand sherds 1 unid/sand sherd 3 unid/sand, pebbles >2mm, <5mm sherds
2/12 W	1 vessel #1 sherd 3 vessel #3 sherds 1 cord/sand, pebbles >2mm, <5mm sherds
2/16 W	83 vessel #1 sherds 2 vessel #3 sherds 1 vessel #4 sherd 11 vessel #6 sherds 1 cord/sand rim sherd with reed punctates on lip 1 cord/sand, pebbles >2mm, <5mm 2 unid/sand
0/14 W	1 vessel #1 sherd
0/1	1 vessel #7 sherd
0/5	1 vessel #3 sherd 1 unid/sand sherd
0/22	1 gray slate gorget fragment 4 vessel #6 sherds 1 vessel #8 sherds 1 cord/sand sherd
2/7	1 quartzite triangular point 1 quartzite Rossville point
3/34	1 simple stamped/pebbles >5mm sherd 1 cord/sand sherd
3/44	1 knotted net/shell sherd 1 knotted net/sand, pebbles >2mm, <5mm sherd 1 fabric/sand, pebbles >2mm, <5mm sherd 3 cord/sand sherds 2 unid/sand sherds 1 unid/sand, pebbles >2mm, <5mm sherd
3/52	3 cord-wrapped dowel/sand, pebbles >2mm, <5mm sherds 1 cord/sand sherd 1 unid/sand sherd 7 unid/sand, pebbles >2mm, <5mm sherds
4/11	1 vessel #6 sherd
Salvage Excavation A	1 vessel #1 sherd 16 vessel #3 sherds 3 vessel #5 sherds 1 vessel #8 sherd
Salvage Excavation B	4 vessel #6 sherds 4 vessel #7 sherds 1 unid/sand sherd
Salvage Excavation D	1 vessel #1 sherd 1 vessel #4 sherd 2 vessel #5 sherds 1 cord/sand rim sherd with reed punctates on lip 2 cord/sand sherds 4 unid/sand sherds 4 unid/sand, pebbles >2mm, <5mm sherds
Historic Feature 1	1 unid/shell sherd
Historic Feature 2	1 vessel #1 sherd 7 vessel #5 sherds
Historic Feature 3	1 vessel #5 sherds
Surface	5 vessel #1 sherds 97 vessel #2 sherds 4 vessel #3 sherds 9 vessel #4 sherds 3 vessel #5 sherds 2 vessel #6 sherds 8 unid/sand sherds 3 vessel #7 sherds 7 vessel #8 sherds 15 cord/sand, pebbles >2mm, <5mm sherds 3 unid/sand, pebbles >2mm, <5mm sherds 2 cord/sand, pebbles >5mm sherds 15 cord/sand sherds

Table 2: Temper and Surface Treatment of Sherds not Assigned to Specific Vessels

Temper	Surface Treatment						
	Cord	Cord Dowel	Fabric	Net	Simple Stamped	Unid	Total
Sand < 2mm	27					20	47
Sand, pebbles > 2mm, < 5mm	17	3	1	1		18	40
Sand, pebbles > 5mm	2		1		1		4
Shell				1		1	2
Total	46	3	2	2	1	39	93

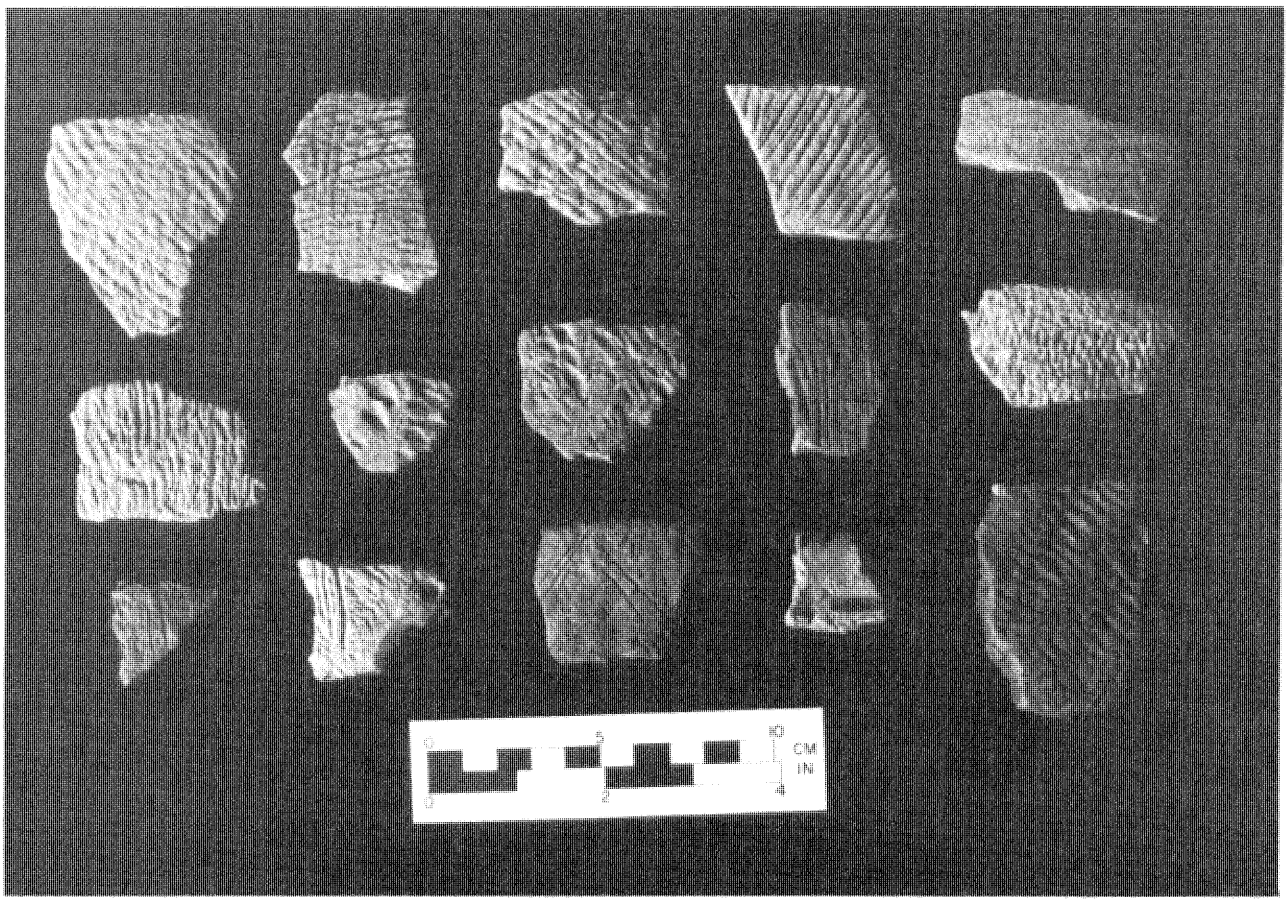

Figure 1: Woodland Sherds*. Top row, left to right: vessel #1 sherd from 2/16W, vessel #2 sherd with incised chevron from Area A backdirt piles (surface), vessel #3 sherd from 2/12W, vessel #4 rim sherd from surface, vessel #5 sherd from Historic Feature 2. Middle row, left to right: vessel #6 sherd from 2/16W, vessel #7 sherd from salvage excavation C, vessel #8 sherd from salvage excavation A, simple stamped Gaston Ware sherd from 3/34, fabric impressed Branchville/Cashie Ware sherd from surface. Bottom row, left to right: fabric impressed and incised Townsend Ware sherd from 3/44, cord marked sherd with incised chevron from surface, incised rim from 3/52, cord marked sherd showing interior rim notches from 2/12W, cord-wrapped dowel impressed rim from 3/52.*

Figure 2: Woodland Lithics. *From left to right: quartzite triangular point from 2/7, quartzite Rossville point from 2/7, gray slate gorget fragment from 0/22.*

Table 3: Ceramic Vessels

Vessel	Surface Treatment	Twist	Temper	Paste	Color	Thickness	Decoration	Sherd Count
1	cord	?	sand, pebbles >2mm, <5mm	sandy	tannish brown	6-9mm	lug handle, drill holes	95
2	cord	Z	sand, pebbles >2mm, <5mm	sandy	brownish red tan	5-7mm	incised chevron	97
3	cord	S	sand, pebbles >2mm, <5mm	clayey	tannish light brown	5-9mm	none	26
4	cord	S	sand	clayey	tan	7-8mm	drill hole	11
5	fabric	?	sand, pebbles >5mm	sandy	brownish tan	7-10mm	incising	16
6	cord	S	sand, pebbles >2mm <5mm	sandy	brownish tan	7-11mm	none	23
7	cord wrapped dowel	?	abundant sand, crushed sherds	sandy	reddish brown tan	7-10mm	none	7
8	cord wrapped dowel	?	sand, crushed sherds	clayey	reddish tan	7-9mm	none	9

Fragments of vessel #1, represented by 93 sherds, were found in several different excavations, though the main concentration was in unit 2/16 W (Table 4). The sherds exhibit a surface treatment which appears to be repeatedly overstamped cord markings. The color is a tannish brown. The temper is sand and rounded particles, and many of the particles appear to be feldspar rather than just quartz as with the other sand and pebble tempered sherds from the site. No decoration is evident on any of the sherds, though there are mend holes on a few sherds and what appears to be the remnants of a lug handle on one sherd.

Table 4: Provenience of Vessel #1 Sherds

Provenience	Sherd Count
4/22 W	2
2/12 W	1
2/16 W	83
0/14 W	1
salvage excavation A	1
salvage excavation D	1
Historic Feature 2	1
surface	5
Total	95

The 97 sherds that represent vessel #2 were found entirely in artifact collectors' backdirt piles in Area A of the site. No other vessels were represented by the sherds recovered from these backdirt piles. It appears that this was an area where one pot was broken and scattered over an area of at least fifteen by fifteen feet, judging by the size of the artifact collectors' excavation. The temper includes sand and frequent quartz pebbles up to 5mm in size. The surface treatment is a thick Z twist cord. The vessel falls into the Prince George Ware type, based on the large and abundant pebbles. The color is light brown with a reddish tint. Two mending sherds have an incised chevron design (Fig. 1).

Vessel #3 is cord marked (S twist) with a clayey paste and falls into the Prince George ware type. The cord markings are perpendicularly overstamped, giving the surface treatment a net-like appearance. The temper is sand with abundant quartz pebbles ranging up to one centimeter in size. The thickness of the vessel ranges from 5 to 9 mm and is quite variable, even on a single sherd. The uneven nature of the sherds is probably due to the coarse temper. The quartz pebbles often come through the smoothed interior surface with tiny cracks surrounding each protrusion.

Table 5: Provenience of Vessel #3 Sherds

Provenience	Sherd Count
2/12 W	3
2/16 W	2
0/5	1
salvage excavation A	16
surface	4
Total	26

Vessel #4 is represented by eleven sherds and has a very fine compact sandy paste. The vessel is cord marked and the cordage used had an S twist. A few sherds exhibit tie holes. The color is an even tan, and the wall thickness is a uniform 7-8mm. This vessel is categorized as Stony Creek ware.

Table 6: Provenience of Vessel #4 Sherds

Provenience	Sherd Count
2/16 W	1
salvage excavation D	1
surface	9
Total	11

Vessel #5 is a relatively thick (averages 9mm) fabric impressed vessel with a sandy paste and abundant quartz pebbles as temper ranging up to one centimeter in size. This vessel also exhibits narrow (0.5-1mm) incised criss-crossing diagonal lines as decoration.

Table 7: Provenience of Vessel #5 Sherds

Provenience	Sherd Count
salvage excavation A	3
salvage excavation D	2
Historic Feature 2	7
Historic Feature 3	1
surface	3
Total	16

The sherds attributed to vessel #5 may date from the Historic period, as evidenced by their frequent occurrence in historic features. Out of 17 sherds, 8 were recovered from Historic Features 2 and 3. Since the Historic occupation of the site represents an early influx into the area, it is possible that the inhabitants obtained the pot from a Native American living nearby. The sherds may merely have been incidental inclusions in the features, however.

Vessel #6 is represented by 23 sherds and falls into the category of Stony Creek Ware. The surface is cord marked, and the temper is sand with pebbles no larger than 3mm. It is possible that more than one vessel is actually represented by the sherds assigned to vessel #6.

Table 8: Provenience of Vessel #6 Sherds

Provenience	Sherd Count
4/22 W	1
2/16 W	11
0/22	4
4/11	1
salvage excavation B	4
surface	2
Total	23

Vessel #7 is represented by 7 sherds. The surface treatment is cord-wrapped dowel impressed, and the temper is abundant sand and occasional crushed sherds. The color is a reddish tan brown.

Table 9: Provenience of Vessel #7 Sherds

Provenience	Sherd Count
0/1	1
salvage excavation B	4
surface	2
Total	7

Vessel #8 is very similar to vessel #7, except vessel eight has very little sand in the temper and has a clayey paste. Crushed sherds are evident in the temper, and one sherd has a crushed steatite tempered sherd in the temper. The surface treatment is highly variable, even on a single sherd. There are cord-markings, cord-wrapped dowel impressions, and some sort of scraping or incising on the sherds (Figure 1). As with vessel #6, these sherds may actually represent more than one vessel.

Table 10: Provenience of Vessel #8 Sherds.

Provenience	Piece Count
0/22	1
salvage excavation A	1
surface	7
Total	9

A possible progression in technology can be seen between the Early Woodland cord-wrapped dowel impressed, crushed sherd tempered pottery and the

sand tempered Stony Creek series in Southeastern Virginia. A vessel section has been recovered by Nottoway River Survey from the Gravel Pit Site (44SX14) just six miles southwest of the Cactus Hill Site which has steatite tempered sherds crushed and used as temper. A single sherd with the same crushed steatite tempered sherd temper has been found at the Cactus Hill Site. These sherds establish a clear cultural link between the use of steatite temper and crushed sherd temper.

An additional link between crushed sherd temper and cord-wrapped dowel impressed surface treatment is suggested based on the recovery of sherds with the two traits from the Cactus Hill Site and the Tawney Site in Gates County North Carolina. A nearly complete pot recovered at the Tawney Site was reported by MacCord and Darden (1966:25, 29) and exhibits crushed sherd temper, cord-wrapped dowel impressed surface treatment, and a flat bottom. Although the surface treatment was identified within the report as having "coarsely cord- and fabric-marked surfaces," a picture of the vessel clearly shows the cord wrapped dowel surface treatment.

A cord-wrapped dowel impressed vessel with only sand temper was recovered by Nottoway River Survey at the Cerny Site, located 6½ miles east of the Cactus Hill Site. The pot has a conical base and no crushed sherds are evident in the paste. This suggests that while the sherd temper and flat bases disappeared, the cord-wrapped dowel impressed surface treatment remained.

It is significant that the location of Woodland artifacts is limited to areas near the river, and to areas A, A-B, and B on the south side of the hill sloping towards the wetland.

Lithics

The only lithics attributable to the Woodland period are one gorget fragment and two projectile points (Figure 2). As mentioned previously, many of the sherds recovered were found mixed with the upper zone of the Late Archaic levels at the site. Similarly, no Woodland points were excavated in a purely Woodland context. Therefore, the points were identified by style rather than context. When placing points in the Woodland timeframe by shape only, one must be careful not to misidentify Middle Archaic Morrow Mountain I and II points as Piscataway or Rossville points. The Morrow Mountain I point as defined by Coe (1964:37-38) is larger in the Piedmont of North Carolina than in other areas (compare, for example, with Chapman 1979:24-27), and many popular projectile point guides incorrectly identify a tapered stem form of the Savannah River Broadspear (referred to as Island Swamp in this report) as Morrow Mountain I, leaving some to assume that the smaller forms are Woodland. In Southeastern Virginia, Morrow Mountain I points rarely exceed four centimeters in length, making them easy to misidentify as Woodland points. In addition, Morrow Mountain II points are sometimes reworked to the extent that they are identical to Rossville points as described by Stephenson et al. (1963:145, plate XXIII).

It is possible that some of the points identified as Morrow Mountain are actually Rossville points. The two types are usually too similar to differentiate unless they are found at a site with high stratigraphic integrity, which Cactus Hill lacks in Area B.

The two Woodland points are shown in Figure 2. One is a Rossville point made of quartzite, and the other is a medium sized triangular point, also of quartzite. Ironically, though these points are thought to date to different times within the Woodland period, they both came out of the same level of the same excavation unit (2/7), which did not produce a single sherd of pottery.

The Historic Component

The Historic component of the Cactus Hill Site is represented by artifacts and features from the early 18th century. Historic documents were researched in order to put a name to the artifacts recovered.

Historic Documentation

Information on patents and land grants within the area of modern day Sussex County has been compiled by Hudgins (n.d.), and consists of over 800 land surveys typed from their original hand written entries within deed books. After plotting the patents in the vicinity of the Cactus Hill Site and researching the Surry and Sussex County court records (Sussex County was part of Surry County until 1753), the identity of the 18th century property owners of the Cactus Hill Site became evident.

The land was originally the northern part of a 1,400 acre tract granted to Robert Hawthorne in 1701 for the transportation of 28 people into the Colony of Virginia (Hudgins, personal communication 1993). Hawthorne proceeded to sell off portions of this land to

others, and the area of the Cactus Hill Site was sold to Thomas Dickens (also spelled Dickins, Dinkins, and Dickings). Because no deed was recorded, the date of this transaction is unknown, but would fall between 1701, when the land was patented to Hawthorne, and 1718, when Thomas Dickens died.

The approximate boundary of this tract has been reconstructed by plotting the surrounding land patents and is shown in Figure 4. These patents should line up with each other, but errors in the original 18th century surveys prevent this. A good idea of the approximate boundary location can be gathered from this figure, however.

Thomas Dickens had a large family, and judging by the court records at least two, possibly more house sites should be located on the tract he purchased from Hawthorne. Since a thorough archeological survey of this land has not been carried out, it is not possible to assign the Cactus Hill site to a single member of the Dickens family at this time. It is possible, however, to say that the house belonged to either Thomas Dickens, Alexander (Sanders) Dickens, or William Dickens.

Historic Features

Three 18th century Historic features were identified. Features 1 and 2 were, for the most part, excavated by artifact collectors before their plan view or stratigraphy could be recorded. However, the author was allowed to examine most of the material recovered from Feature 2 by its excavator. Based on his account, we have a fairly accurate description of the size and location of this feature. Feature 1, which was excavated by other collectors, is represented primarily by artifacts left behind or missed by the collectors. Feature 3 was encountered in unit 0/14 W, but its boundaries were unclear and could not be determined accurately. Also, Feature 3 was much smaller than Features 1 and 2.

Faunal remains recovered from Features 1, 2, and 3 have been analyzed under the direction of Joanne Bowen of the Colonial Williamsburg Foundation (see the attachment to this appendix).

Feature 1 was excavated in 1992 by artifact collectors. For the most part, only the larger historic sherds and the complete pipe bowls were kept by the collectors; everything else was discarded on backdirt piles. Table 11 is a list of the artifacts recovered from the backdirt piles associated with this feature. It appears that this feature was deliberately filled with trash, since the surrounding plowzone did not produce nearly the density of artifacts found in the feature. Whether the feature represents a deliberate trash pit or an abandoned root cellar or other feature filled with trash is uncertain.

As can be seen in Table 11, many of the sherds from Feature 1 represent single vessels. Three coarseware vessels are represented. One of the vessels is a milkpan with light brown lead glaze on the interior and no glaze on the exterior. Another coarseware vessel is a bowl with dark green glaze on the interior and light green glaze on the exterior. A single large coarseware sherd that does not belong to either of the other two vessels has an unidentified form.

Two Staffordshire Slipware cups are represented, one with a collar and rim dots, and another without the collar or dots. The Westerwald stoneware sherds all represent a single tankard (mug) of large capacity. The colono ware from Feature 1 is less easily allocated to specific vessels. Twenty-two of the colonoware sherds are definitely from a single bowl. These sherds are very thick at the base (12mm), and thin out to 5mm at the rim. The paste is clayey, and the temper isabundant subangular (but not crushed) quartz pebbles. This is not typical for colonoware in this area, and may represent a European or African variation of the Native American Gaston/Cashie Ware indigenous to the area. Judging by the curvature of a large rimsherd, the mouth of the bowl was approximately 9 inches in diameter, and the depth of the bowl was between 4 1/2 and 5 inches. The remaining 8 colonoware sherds from Feature 1 have very little temper and are referred to as "fine temper" colonoware. They are similar to Binford's Courtland Series (Binford 1964:303-314) and MacCord's Camden Ware (MacCord, 1969:12-18). As their label implies, the temper in these sherds is generally a fine sand. The surface is always smooth and even burnished in a few cases. The sherds are also much thinner, averaging 7mm. At least 2, probably more, vessels are represented by these 8 sherds.

Exactly 200 tobacco pipe fragments were recovered from Feature 1, only two of which were local (terra-cotta). Using Binford's pipe stem dating formula (Hume 1982:299), Feature 1 has a date of 1739.6. Most of the tobacco pipes recovered from Feature 1 were Hume's type 18 (1982:303) which Hume dates between 1720 and 1820. The only pipe bowl with a heel (Hume's type 15 or 16) from the site was found in Feature 1. Also the only one pipe bowl was recovered with a maker's mark, which was "RT" (Figure 6).

Many items from this feature were burned, and much charcoal and fire reddened daub was present, indicating that it was possibly a root cellar or other feature located inside a waddle and daub structure destroyed by fire. Dimensions of the feature are unknown, but from talking with the collectors who excavated it, the feature was at least 5 feet by 5 feet, probably much larger. The area around the feature was too disturbed by collectors to look for postmolds, and presently this area has been claimed by the sand pit.

A few of the metal artifacts warrant further mention. First, a sixpence dated 1696 was recovered from the surface near Feature 1. This was the only coin recovered from the site. Also, an iron fish hook was found associated with two flat pieces of lead that had each been rolled into a tube for use as fishing line weights. A fragment of an iron jointed mouth curbed bit was recovered from Feature 1, indicating that the Dickins family kept at least one horse. A large iron hook with eye was found and may have been a part from a horse drawn carriage or plow.

The firing mechanism of a flint lock rifle, specifically a dog lock similar to that shown on page 25 (Figure 27) of Peterson's *Arms and Armour in Colonial America* (1956), was also recovered. Peterson (1956:31) mentions that these rifles were used mostly between 1625 and 1675. If the early 18th century date for Feature 1 is correct, this means that the rifle was in use for quite awhile before being discarded, possibly indicating that the residents were of low economic status.

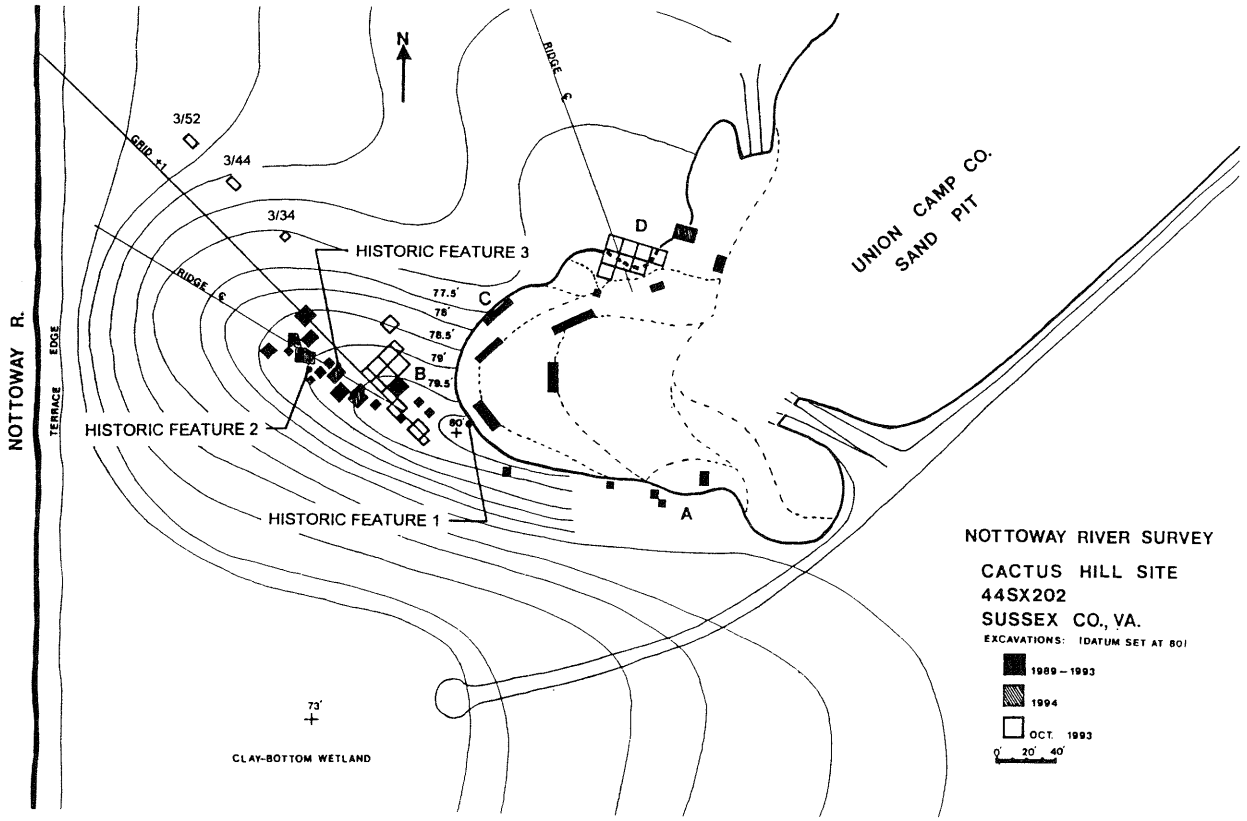

Figure 3: Cactus Hill Site Map.

Table 11: Historic Feature 1 Artifacts

Ceramics	Glass	Metals	Pipes	Misc
20 Westerwald tankard sherds (same vessel)	42 wine bottle fragments	1 brass hinge fragment	198 kaolin pipe fragments	1 black faceted bead fragment
9 Staffordshire Slipware cup sherds (two vessels)		1 brass skimmer	2 terra cotta pipe fragments	burnt daub
10 coarseware milkpan sherds (same vessel)		24 brass pins		animal bone fragments
11 coarseware bowl sherds (same vessel)		1 brass pair of cufflinks		1 mud dauber's nest
1 coarseware unid vessel form sherd		2 brass unid fragments		
22 coarse temper colono ware bowl sherds (same vessel)		4 pewter spoons		
8 fine temper colono ware unid vessel form sherds		10 lead shot		
		2 lead unid fragments		
		1 iron fishhook with two lead sinkers		
		1 iron dog lock		
		1 iron key		
		4 iron knives		
		1 iron two-tined fork		
		1 iron pair of scissors		
		1 iron buckle fragment		
		1 iron jointed mouth curb bit		
		225 hand-wrought iron nails		
		1 iron large hook with eye		
		1 iron clothes iron missing handle		
		1 iron pointed rod		
		10 unidentified iron objects		

Feature 2 is more accurately represented. Oval in plan view and measuring approximately 4 feet by 3 feet, this feature is smaller than Feature 1 and located 110 feet to the east-southeast. A complete historic artifact catalog is available and is presented in Table 12. Feature 2 contained only two metal artifacts other than nails; one of these is a possible knife handle, while the other is a piece of scrap iron. Also, no ceramics other than coarseware and colonoware were recovered. Seven sherds of Woodland vessel #5, a pebble tempered fabric impressed vessel with incising, came from this feature, possibly indicating it is of Historic age. Most of the coarseware sherds were burned to the extent that their glaze has cracked off. Some of the coarseware sherds do mend, suggesting that all the coarseware sherds recovered from Feature 2 are from the same vessel, apparently a large storage jar.

Only one wine bottle fragment was recovered from Feature 2. Many of the artifacts in Feature 2 were burned, and the feature contained significant quantities of burnt daub, insinuating a collapsed burned waddle and daub structure. The structure around Feature 2 appears to be an outbuilding to the structure around Feature 1, based on the lack of household utensils and refined ceramics.

Table 12: Artifacts from Feature 2

Ceramics	Metals	Glass	Misc
10 colonoware sherds	40 hand-wrought nails	1 wine bottle lip	animal bones
8 coarseware sherds	1 iron knife handle (?)		wood charcoal
32 kaolin pipe fragments	1 piece of scrap iron		daub sample
2 terra cotta pipe fragments			egg shell fragments

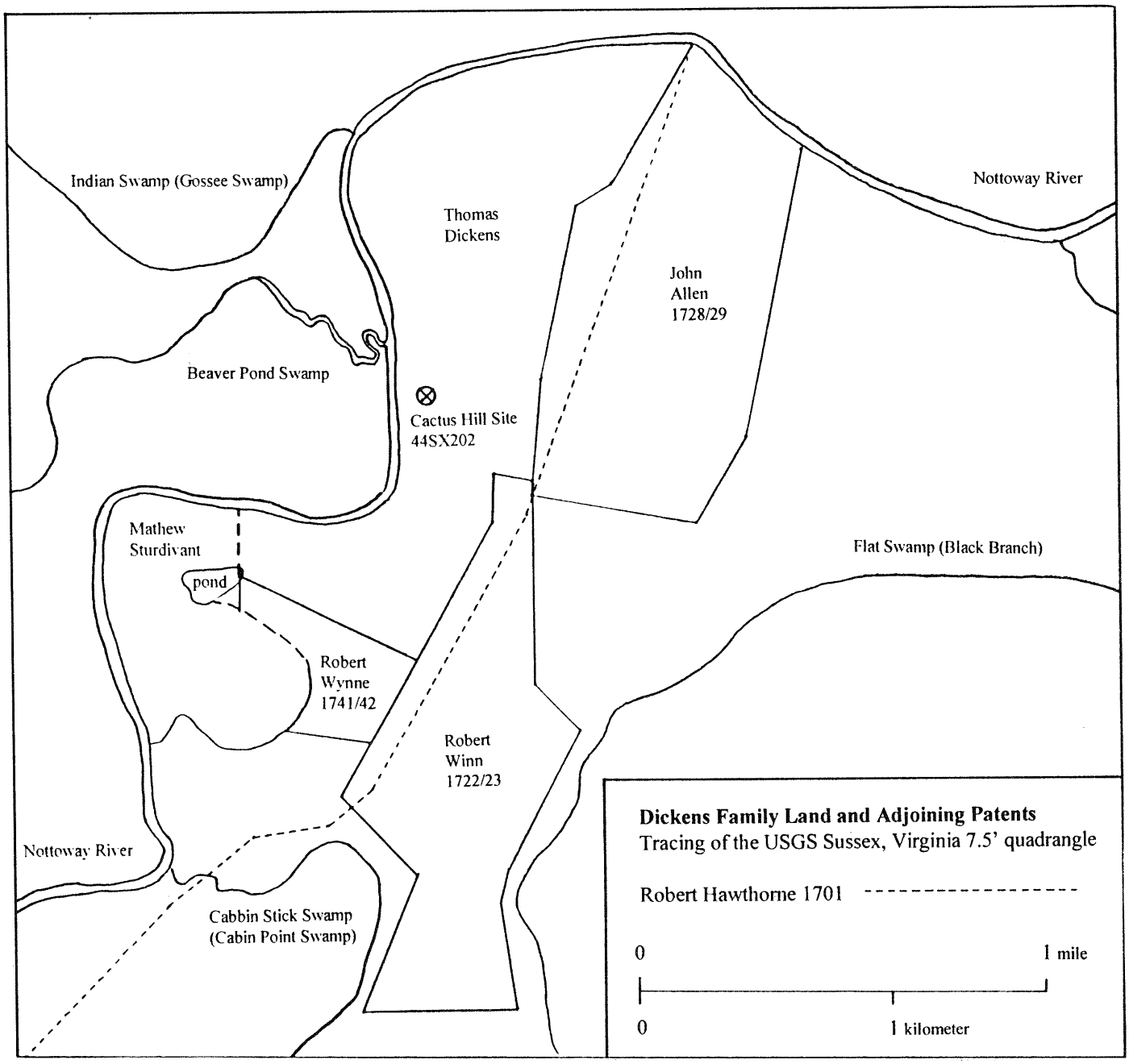

Figure 4: Dickens' Land. *Map showing approximate boundary (reconstructed from surrounding patents) of land Thomas Dickens purchased from Robert Hawthorne sometime between 1701 and 1718. Only the land patents adjacent to Dickens' land are shown. All land between dotted line and Nottoway River is Robert Hawthorne's original patent of 1701. Watercourses are indicated by their 18th century names, with their modern names in parentheses where applicable.*

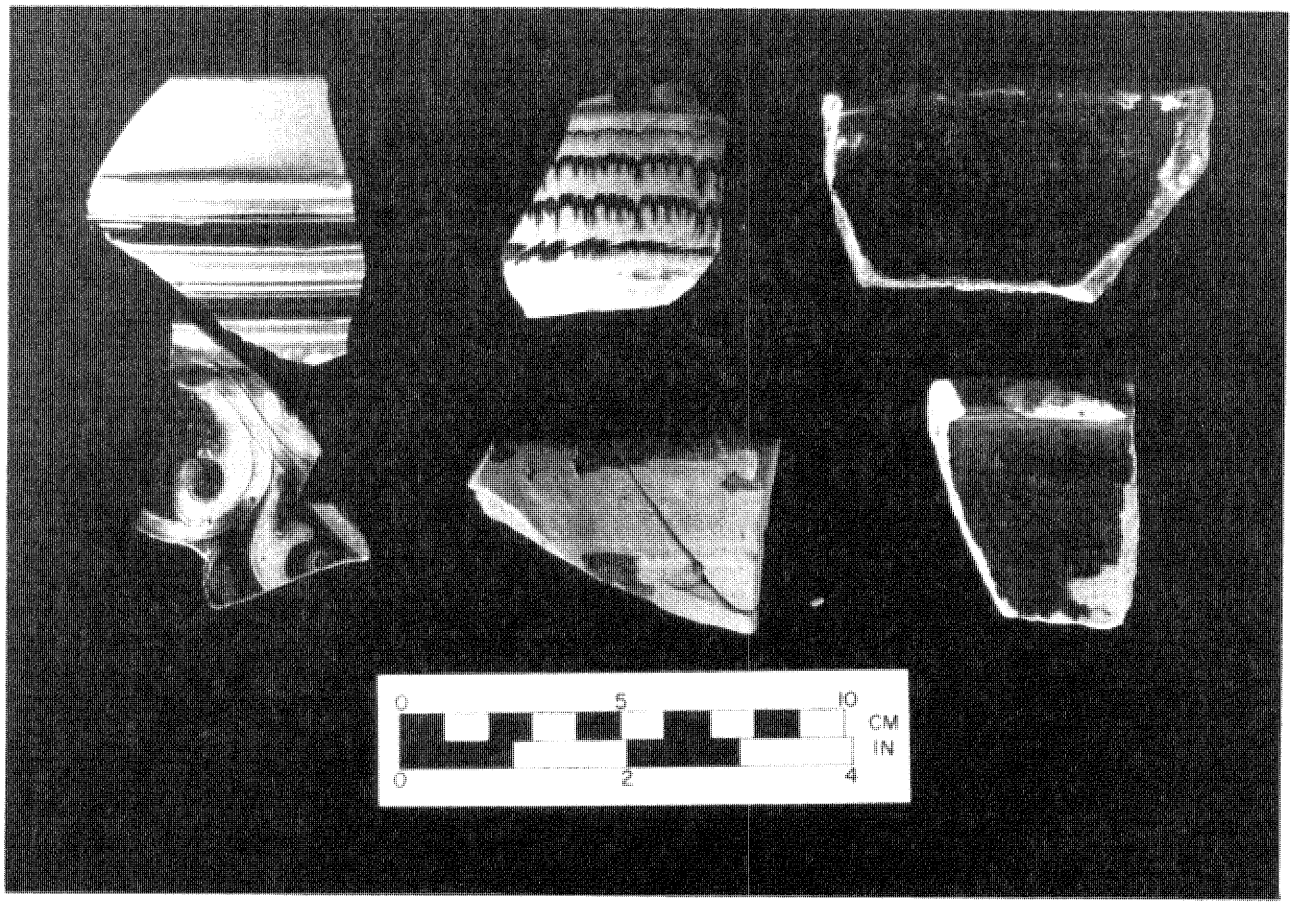

Figure 5: Historic Ceramics. *Far left: Westerwald tankard from Feature 1. Top center: Staffordshire Slipware cup from Feature 1. Bottom center: coarseware storage jar rim showing cracked off glaze from Feature 2. Top right: coarseware bowl rim from Feature 1. Bottom right: coarseware milkpan rim from Feature 1.*

Figure 6: Pipes. *Top row, left to right: kaolin pipe bowl with "RT" maker's mark from Feature 1, kaolin pipe bowl with heel from Feature 1, terra cotta pipe bowl with flat heel from surface. Bottom row, left to right: kaolin pipe bowl from Feature 1, rouletted terra cotta pipe bowl fragment from surface.*

Table 13: Historic Feature 3 Artifacts.

Ceramics	Pipes	Metals	Misc
12 fine temper colonoware sherds	1 terra cotta pipe stem fragment	2 iron hand wrought nail fragments	8 daub chunks 1 mud dauber's nest animal bone fragments

Feature 3 was located in excavation unit 0/14 W and was similar to, though smaller than, Feature 2. The boundaries of this feature were unclear, and the feature's location can be said only to be the north corner of unit 0/14 W. Due to its proximity to Feature 2 (Figure 3), it was probably related to that feature in some way. Only colonoware ceramics were found, and some fire reddened daub was again recovered

Other Historic Artifacts

The Historic artifacts not found within features are listed by provenience in Table 14. As can be seen by comparing Tables 11, 12, 13, and 14, there is a dichotomy between the Historic artifacts recovered from Feature 1 and the artifacts recovered from Features 2 and 3, from the upper levels of excavations, and from the surface. The most notable contrast is the lack of household utensils from anywhere but Feature 1, with the exception of 2 scissors fragments from the surface and a possible knife handle from Feature 2. Also, while Feature 1 contained Westerwald, Staffordshire Slipware, a coarseware milkpan, and a coarseware bowl, all other proveniences produced mainly colonoware and non-discript coarseware sherds. Exceptions are sherds of Staffordshire Slipware, a coarseware milkpan, and a coarseware bowl from the surface, but the milkpan and bowl sherds (and likely the Staffordshire sherds as well) are pieces of the same vessels found in Feature 1. This material was likely in Feature 1 originally, before the feature was truncated by plowing and deforestation.

This dichotomy could mean that a structure near or over Feature 1 served as the main living area or kitchen (or both, if the kitchen was not separate), which would be expected to have more household items. The other features may then represent outbuildings, where only utilitarian wares would have been in use. Since both Features 1 and 2 had burned artifacts, the features may represent root cellars that were filled with trash after the structures were abandoned, and the structures were accidentally or intentionally burned down.

Another possibility is that Features 2 and 3 represent an early structure (or structures) built when the Dickens family first arrived, which was initially used as living quarters, but then abandoned or used as outbuildings once the structure around Feature 1 was constructed.

It must also be mentioned, especially given that Feature 1 was so close to and eventually taken by the sand pit, that the sand mining operation claimed more of the historic component. There is no way of knowing the original extent of the historic site. Only a few isolated artifacts have been recovered in area C, and one nail was found in area D, indicating that the scatter of historic artifacts was not intense but did extend into these areas.

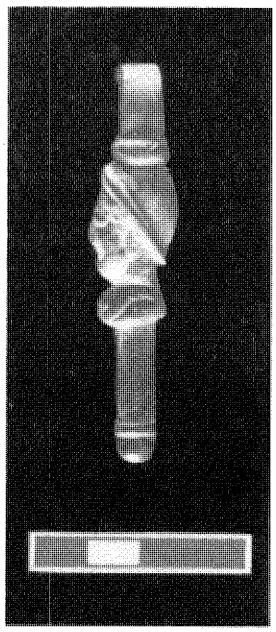

Figure 7: *Brass figurine from surface. (Scale is 1 inch long.)*

Table 14: Historic Artifacts from Proveniences other than Features

Provenience	Artifacts
2/16 W	1 fine temper colonoware sherd
	1 kaolin pipe bowl fragment
	1 iron hand wrought nail
	1 English gunflint
	1 English flint flake
	4 daub chunks
2/12 W	1 fine temper colonoware sherd
0/16 W	2 fine temper colonoware sherds
0/22	1 fine temper colonoware sherd
	1 daub chunk
1/9	1 kaolin pipe stem fragment
	1 terra cotta pipe stem fragment
	1 freshwater mussel shell
1/11	1 terra cotta pipe stem fragment
Salvage excavation B	1 kaolin pipe stem fragment
Salvage excavation C	1 kaolin pipe stem fragment
	1 iron hand wrought nail fragment
Salvage excavation D	1 delftware sherd
	5 coarseware sherds
	7 fine temper colonoware sherds
	1 kaolin pipe stem fragment
	5 kaolin pipe bowl fragments
	13 iron hand wrought nail fragments
	7 unid iron fragments

Provenience	Artifacts
Surface	Ceramics
	4 brown stoneware jug sherds (same vessel)
	4 Staffordshire Slipware cup sherds
	4 coarseware bowl sherds*
	5 coarseware milkpan sherds*
	2 coarseware unid vessel form sherds
	10 fine temper colonoware sherds
	1 coarse temper colonoware sherd*
	Pipes
	17 kaolin pipe stem fragments
	11 kaolin pipe bowl fragments
	2 terra cotta pipe stem fragments
	4 terra cotta pipe bowl fragments
	Metals
	1 silver 1696 sixpence
	1 brass figurine
	2 iron scissors fragments
	1 iron buckle fragment
	57 iron hand wrought nails
	3 unid iron fragments
	Glass
	24 wine bottle fragments
	1 white glass donut-shaped bead
	Misc
	1 English flint chunk
	1 daub chunk

* same vessel as represented in Historic Feature 1

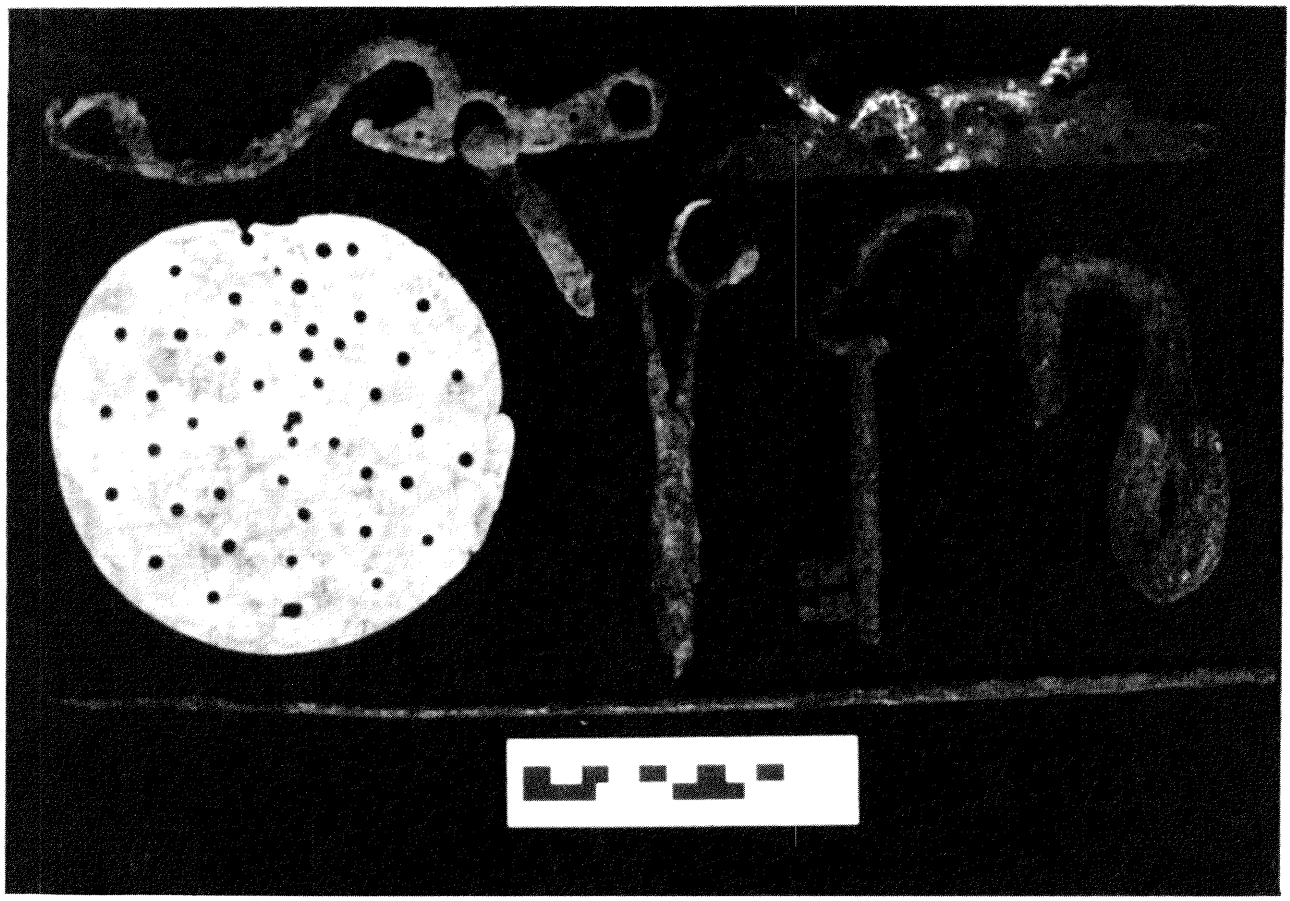

Figure 8: Metal Artifacts from Feature 1. *Top row, left to right: iron jointed mouth curbed bit, iron dog lock rifle firing mechanism. Middle row, left to right: brass skimmer, iron scissors, iron key, iron large hook with eye. Bottom: iron pointed rod.*

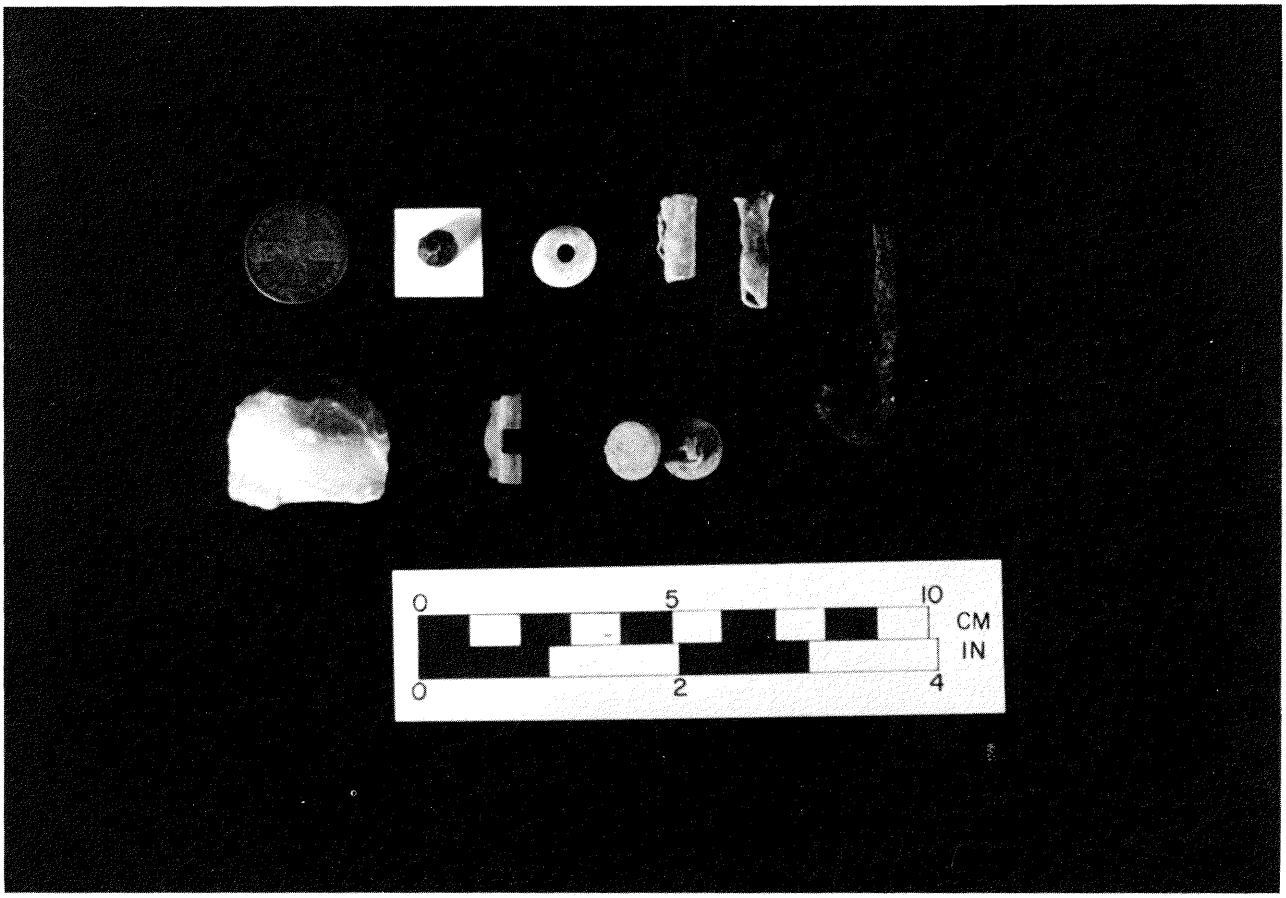

Figure 9: Other Historic Artifacts. *Top row, left to right: silver 1696 sixpence from surface, faceted bead fragment from Feature 1, opaque white glass bead from surface, 2 lead line weights and iron fishhook from Feature 1. Bottom row, left to right: English gunflint from Feature 1, brass hinge fragment from Feature 1, brass cufflinks from Feature 1.*

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Attachment

to

Analysis of Woodland and Historic Period Occupation at the Cactus Hill Site

Faunal Analysis

Provided by

Joanne Bowen

Colonial Williamsburg Foundation

Telephone: 804-229-1000

The Colonial Williamsburg Foundation

P. O. BOX 1776
WILLIAMSBURG, VIRGINIA 23187-1776

March 19, 1996

Mr. James McAvoy
5861 White Oak Rd
Sandston, VA 23150

Dear Mr. McAvoy,

Enclosed you will find a brief report prepared by my assistant Jerry Dandoy. Given the relatively small number and highly fragmented condition of many of the faunal remains, we opted to limit analysis to identifications. Every fragment has been identified to the lowest possible taxon. In his report Jerry has used both taxonomic and common names, and in charts he lists each fragment identification according to its class, order, or species, and the element. I hope this is satisfactory and that you will find information included in Jerry's report useful.

If you have any questions, please do call either Jerry or myself at (804) 220-7338.

Sincerely,

Joanne Bowen

CACTUS HILL SITE (44SX202)

Jeremiah R. Dandoy
Colonial Williamsburg Foundation
March 19, 1996

A brief analysis was made of the faunal array of five contexts in the Cactus Hill Site (44SX202). The analysis was intended to identify the species contained therein without spending excessive time with all the bones if they did not appear to contribute to increasing the richness of the species within the contexts.

This is the species list for the contexts:

Osteichythyes	Unidentified fish
Castostomidae	Sucker
Tsetudines	Turtle
Chelydridae	Snapping Turtle
Aves	Unidentified bird
Anatidae	Duck sp. (excluding swan and goose)
Gallus gallus	Chicken
Felis domesticus	Cat
Sus scrofa	Pig
Bos taurus	Cow

Given the small number of bone fragments, and the fact that all methods to determine relative dietary estimates require large numbers of bones, we made no attempt to determine the Minimum Number of Individuals (MNI's), or meat weight.

The attached tables show the species by element, using the common species name. The abbreviations "im" and "decid" stand for immature and deciduous respectively, indicating young animals.

CACTUS HILL SITE (44SX202) Historic Feature 1

	UID FISH	TURTLE	UID BIRD	DUCK SP.	CHICKEN	CAT	PIG	COW
SKULL							5 (1 im)	
MANDIBLE							2	
TOOTH							2	
VERTEBRA	8						6	
RIB								1
INNOMINATE								
SCAPULA								
HUMERUS						1	1 im	
ULNA							1	
RADIUS								
CARPEL								
METACARPAL								
FEMUR							1	
TIBIA								
FIBULA								
TARSAL								
METATARSAL								
METAPODIAL							1	
PHALANGE			2					1
SESAMOID								
CARAPACE		2						
TIBIOTARSUS			1					
TARSOMETATARSUS					1			
CARPOMETACARPUS				1				
TOTAL	8	2	3	1	1	1	19	2
There were quantities of unidentified bones and oyster shell in this context								

CACTUS HILL SITE (44SX202) Square 6

	SNAPPING TURTLE	CHICKEN	PIG	COW
SKULL				
MANDIBLE				1
TOOTH			1	
VERTEBRA				
RIB				
INNOMINATE				
SCAPULA				
HUMERUS		1		
ULNA	1			
RADIUS				
CARPEL				
METACARPAL				
FEMUR				
TIBIA				
FIBULA				
TARSAL				
METATARSAL				
METAPODIAL				
PHALANGE				
SESAMOID				
CARAPACE				
TARSOMETATARSUS				
TIBIOTARSUS				
CARPOMETACARPUS				
TOTAL	1	1	1	1
There were quantities of unidentified bone in this context				

CACTUS HILL SITE (44SX202) Historic Feature 2

	SUCKER	UID BIRD	PIG	COW	
SKULL	1		2	1	
MANDIBLE				1	
TOOTH			10(1 decid)	2	
VERTEBRA					
RIB		1		1	
INNOMINATE					
SCAPULA					
HUMERUS					
ULNA					
RADIUS					
CARPEL					
METACARPAL					
FEMUR					
TIBIA					
FIBULA					
TARSAL					
METATARSAL					
METAPODIAL					
PHALANGE					
SESAMOID					
CARAPACE					
TARSOMETATARSUS					
TIBIOTARSUS					
CARPOMETACARPUS					
TOTAL	1	1	12	5	
This context includes quantities of unidentified bones, oyster shell, and egg shell					

CACTUS HILL SITE (44SX202) Excavation Unit W 0/14, level 0 (plowzone)

	PIG	COW	
SKULL			
MANDIBLE			
TOOTH	1	2	
VERTEBRA			
RIB			
INNOMINATE			
SCAPULA			
HUMERUS			
ULNA			
RADIUS		1	
CARPEL			
METACARPAL			
FEMUR			
TIBIA			
FIBULA			
TARSAL	1		
METATARSAL			
METAPODIAL		2	
PHALANGE	2	1	
SESAMOID			
TARSOMETATARSUS			
TIBIOTARSUS			
CARPOMETACARPUS			
TOTAL	4	6	
There were quantities of unidentifiable bones in this context			

CACTUS HILL SITE (44SX202) Excavation unit W 0/14, level 1

	PIG			
SKULL				
MANDIBLE				
TOOTH	1			
VERTEBRA				
RIB				
INNOMINATE				
SCAPULA				
HUMERUS				
ULNA				
RADIUS				
CARPEL				
METACARPAL				
FEMUR				
TIBIA				
FIBULA				
TARSAL				
METATARSAL				
METAPODIAL				
PHALANGE				
SESAMOID				
CARAPACE				
TOTAL	1			
There were quantities of unidentifiable bones in this context				

APPENDIX C

GEOLOGY OF THE CACTUS HILL ARCHAEOLOGICAL SITE (44SX202)

SUSSEX COUNTY, VIRGINIA

Kevin B. Jones and Gerald H. Johnson

Department of Geology

College of William and Mary

Williamsburg, Virginia 23187

INTRODUCTION

Many Paleoindian archaeological sites have been identified along the Nottoway River in Sussex County, Virginia. This reach of the river meanders northeastward for 18 miles (29 km), crossing through the Fall Zone (Figure 1). The bed of the Nottoway is covered with quartzite and quartz cobbles which were used extensively by early inhabitants of the area as a source of lithic material for stone tools (Egloff 1989).

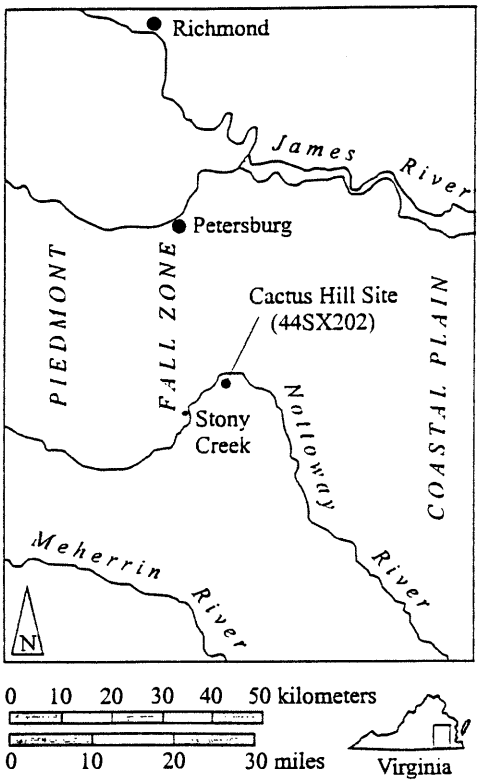

Figure 1. Map showing location of Cactus Hill archaeological site.

Cactus Hill Archaeological Site (44SX202) is located on a terrace east of the Nottoway River about 5 miles (8 km), northeast of the town of Stony Creek, Sussex County, Virginia (Figure 2). The site has yielded abundant Paleoindian cultural material, including project tile points, ubiquitous debitage, fire-cracked rocks, and a virtually complete, stratified archaeological sequence dated by radiocarbon from charred wood to at least 11,000 and possibly 15,000 years before present (B.P.) (McAvoy, this volume). Cactus Hill is one of the earliest sites of human occupation identified on the east coast of the United States.

Sand and gravel was mined at Cactus Hill. Prior to 1995, this mining had produced a pit measuring approximately 600 by 250 feet (180m by 75m) and up to 13 feet (4m) deep. Most of the artifacts from the mined land have been lost. Some remaining areas of high artifact density have been looted, resulting in extensive disturbance of the upper 3 feet (1m) of sediment over much of the southern half of the site.

The exposed stratigraphic sequence at Cactus Hill site is comprised of three units: an older clay unit, an interbedded sand and gravel, and a surficial, stratified, artifact-bearing medium sand which overlies the first two. The sand and gravel is fluvial in origin and inset against the clay unit. The surficial sand is a dune deposit which mantles the paleotopography of the underlying units. The dune sand, which is absent to the north and east of Cactus Hill, probably deflated from the sand and gravel unit to the northwest.

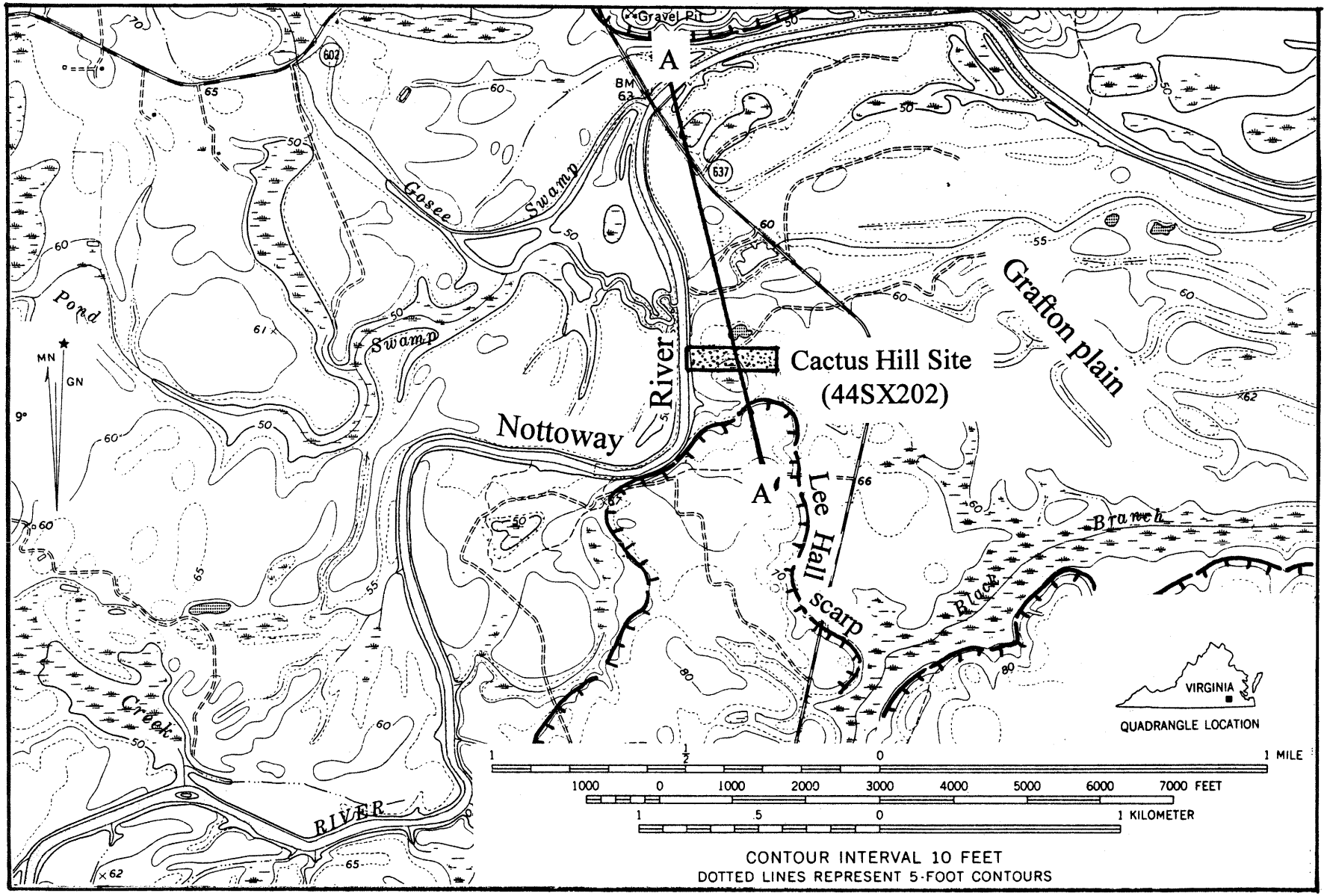

Figure 2. Topographic map showing the location of the Cactus Hill Site (44SX202) and environs (from Sussex, Virginia 7.5 minute quadrangle).

METHODS

A combination of topographic surveying, hand augering, vibracoring, and textural and mineralogical laboratory analyses were used to determine the distribution and origin of the surficial sand.

Sediment samples were obtained by hand auger and vibracore and from pit banks and road cuts. These samples were analyzed for grain size, sorting, roundness, and mineralogy in the laboratory to detemine the variation in the sediments across the site. Samples taken at depth were analyzed in order to locate the contact between the dune sand and the underlying sand and gravel and clay units. The soil profiles of the sand unit and clay unit were also examined. The topography of Cactus Hill and the locations of borings were surveyed with a theodolite.

PHYSIOGRAPHIC SETTING

The Nottoway River flows northeastward through the Fall Zone, from the upper Coastal Plain/Piedmont into the middle Coastal Plain. In the middle Coastal Plain, the river flows through a terraced landscape (Figure 2). The elevation of the river at low flow near Cactus Hill is approximately 45 feet (13.6m) above sea level. A discontinuous, low floodplain exists on the inside of meanders and locally along straight reaches of the river. The first major terrace above the river, on which the lower part of the Cactus Hill site is located, exhibits ridge and swale topography (Figure 3). The rectilinear ridges and swales trend east-west and have a relief of about 5 feet (1.5m). The elevation of the swales on this terrace ranges from 55 to 60 feet (16.7-18.2) above sea level. The terrace upon which Cactus Hill is located is correlated with the Grafton Plain and is bounded on the south by the Lee Hall Scarp and the Nottoway River valley on the north. A succession of terraces with tread elevations of about 75 feet (22.7) and 100 feet (30m) above sea level lie above the Lee Hall Scarp.

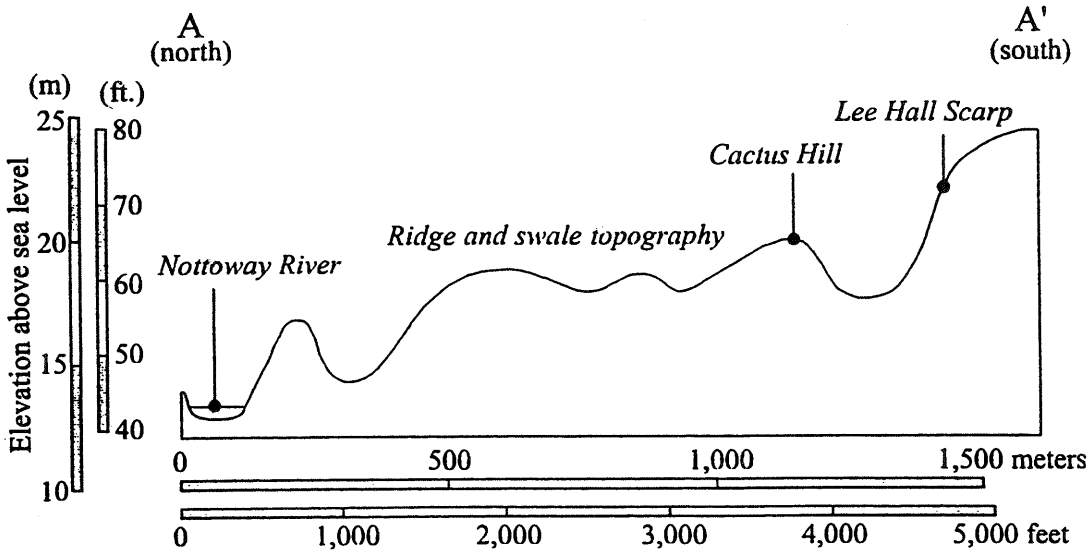

Figure 3. Topographic cross-section along line A-A' showing the Nottoway River, ridges and swales on the first major terrace, and the Lee Hall scarp.

Topographically, the Cactus Hill site exhibits different morphological characteristics from west to east (Figure 4). The western part of Cactus Hill (C-C') is asymmetric; the ridge slopes gently to the north and more steeply to the south. The central part of the ridge is nearly symmetrical, sloping to the north and south at about 1° (B-B'). At the eastern end of the site, a buried north-facing scarp emerges from under the surficial sand that masks it to the west.

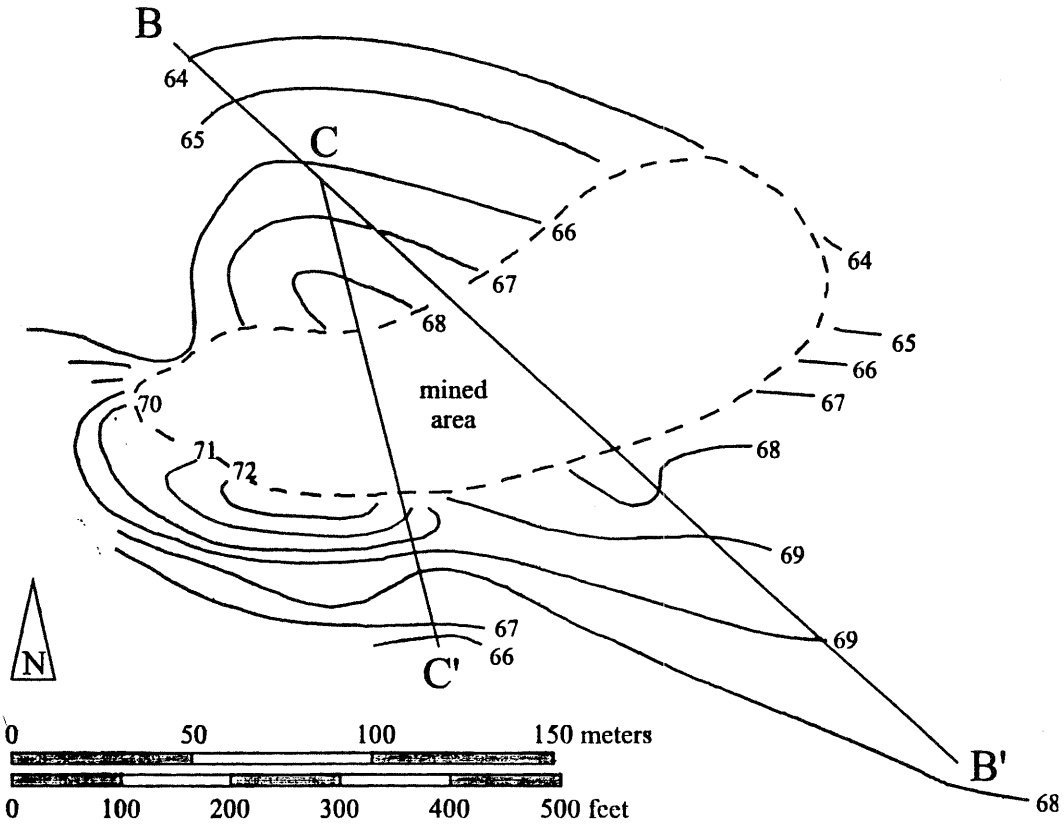

Figure 4. Topographic map of Cactus Hill showing the area of sand and gravel mining. Contour interval 1 foot. Points represent surveyed points.

GEOLOGIC SETTING

Much of the lithic material found on the Cactus Hill site came from the bed of the Nottoway River and was used by early inhabitants of the area for the manufacture of tools and weapons. The source of cobbles and small boulders on the river bed and in the banks is the Piedmont rocks to the west and the thin discontinuous gravelly beds at the base of the upper Coastal Plain exposed in the Fall Zone. The Piedmont rocks of the Nottoway drainage basin include granites, slates, kyanitic quartzites, abundant quartz veins, and a variety of mafic to felsic igneous and metamorphic rocks. The weathered mantle on the Piedmont contains abundant quartz clasts, which over time become introduced into the Nottoway drainage system.

The sediments of the upper middle Coastal Plain contain coarse clasts derived not only from the Piedmont but also from the mountains to the west of the Piedmont. Principal among these clasts are the quartzites of the west flank of the Blue Ridge and adjacent Valley and Ridge. The present drainage basin of the Nottoway does not extend to the Blue Ridge or Valley and Ridge, however. These quartzites were initially eroded from the ancestral Appalachian Mountains, and have been moved eastward during repeated cycles of transportation throughout the Mesozoic and Cenozoic.

The bed of the Nottoway River is mantled with pebbly, cobbly, and sandy alluvium. The base of the alluvium rests on coarse sediments of the Cretaceous Potomac Group (Weems et al., in preparation). The Nottoway channel walls are cut into early and middle Pleistocene formations, including the Windsor, Charles City, and Chuckatuck, and the Pliocene Yorktown Formation.

STRATIGRAPHY

Three stratigraphic units are recognized on the Cactus Hill site: an older basal clay unit with a probable paleosol, a fluvial sand and gravel, and a surficial aeolian sand (Figure 5).

The basal clay unit in exposure is typically a mottled light grey (N7) and dark yellowish orange (10YR6/6), compact silty clay containing scattered sand grains. The sand grains are rounded and range in size from fine to coarse. This unit, tentatively assigned to the Chuckatuck Formation, coarsens downward into a light gray clayey, silty fine sand. The paleosol developed on the clay is similar to the modern Altavista-Augusta soils (Hodges, persersonal communication).

The fluvial unit is typically a moderate yellowish-brown (10YR5/4), very poorly sorted, pebbly coarse sand. The sand grains are mostly angular, whereas the pebbles and scattered cobbles are well-rounded. Mineralogically, the unit is at least 95 percent quartz and less than 5 percent feldspar with a trace of heavy minerals. The fluvial unit is inset against the clay unit.

The surficial sand mantles only part of the Cactus Hill site and contains the stratified sequence of archaeological artifacts. The surficial sand covers a part of the fluvial unit, thickens southeastward to where it laps onto the clay unit, and then thins southeastward and eastward across the clay unit. The surficial sand is typically a moderate yellowish-brown (10YR5/4), moderately sorted, subrounded medium sand. It is similar in composition to the gravelly sand and is composed of about 94 percent quartz, 5 percent feldspar, and 1 percent heavy minerals and lithic fragments, including numerous mica flakes.

RESULTS

Auger samples show that the stratigraphic sequence in the central and northern parts of the Cactus Hill site consists of a surficial sand underlain by only the fluvial sand and gravel unit (Figure 6). In the western part of Cactus Hill, the surficial sand overlies the sand and gravel unit on the gentle north slope and the clay unit on the steeper south slope (Figure 6).

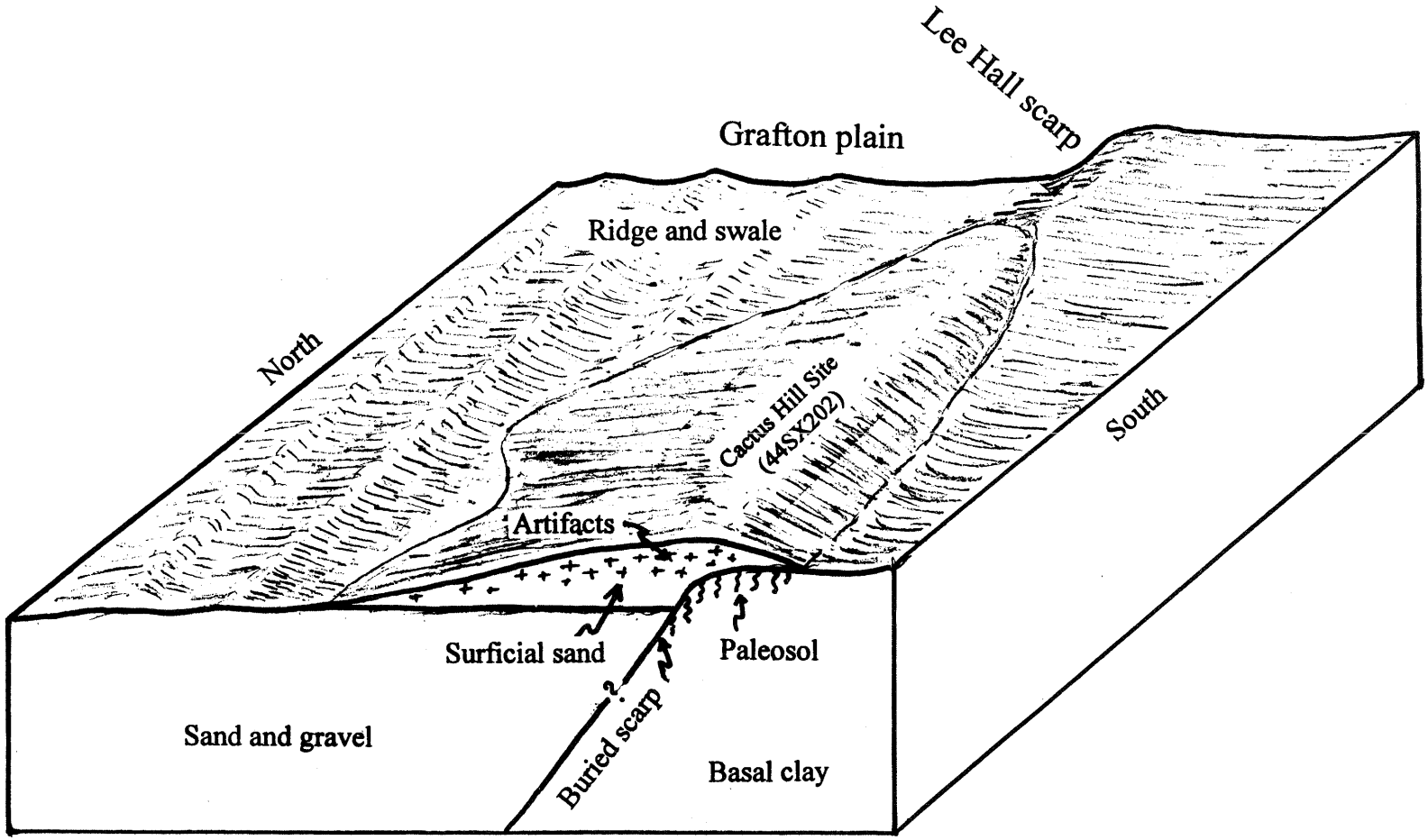

Figure 5. Schematic diagram of the Cactus Hill area showing the stratigraphy and physiography of the site.

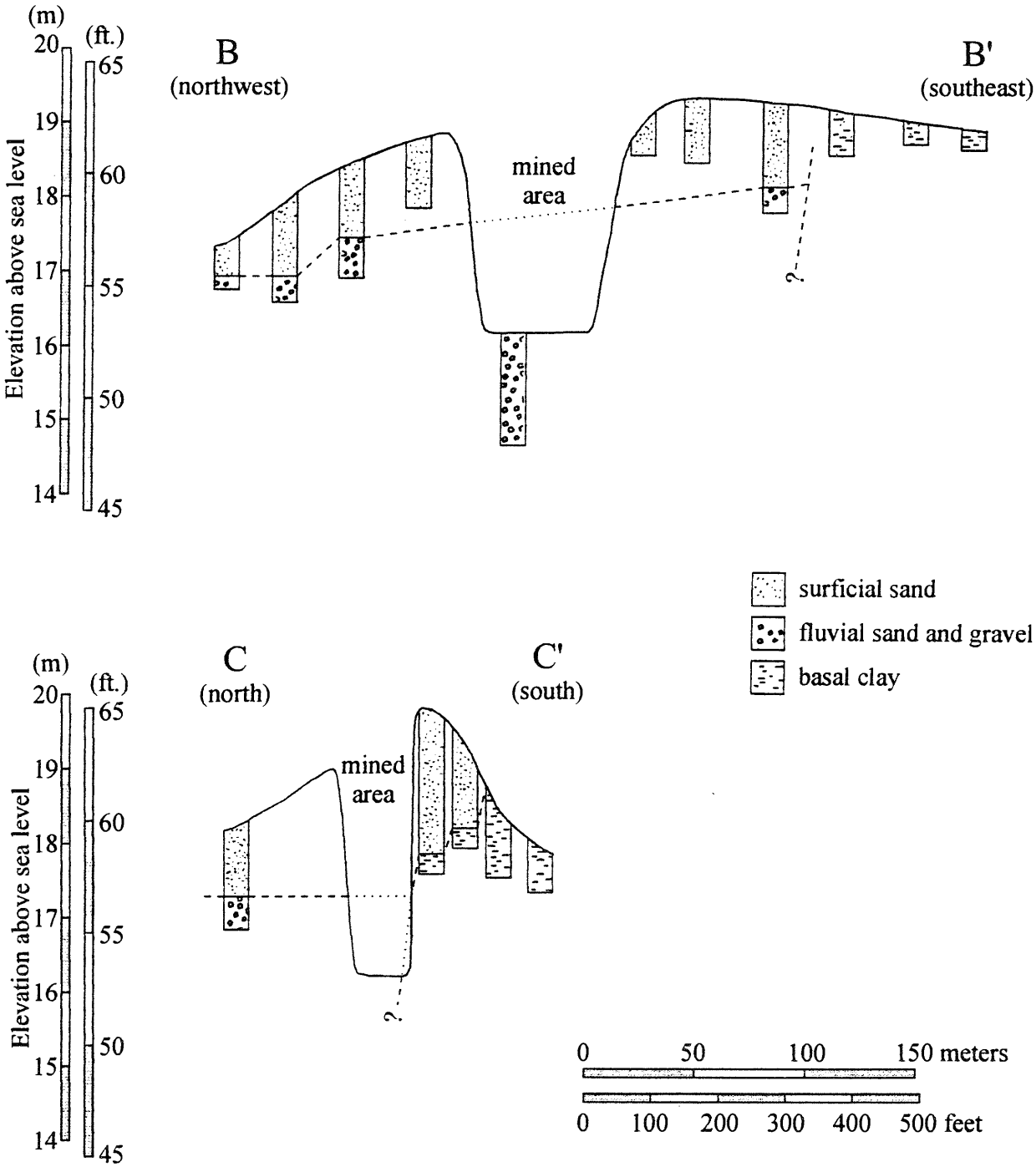

Figure 6. Geologic cross-sections along lines B-B' and C-C' showing the sequence of sediments from auger holes.

Auger sampling also shows that the topography of the central part of Cactus Hill approximates the contact between the surficial sand and fluvial sand and gravel unit. The sand unit here is about 4 feet (1.2m) thick, although it thins to only 1.7 feet (0.5m) at the northwestern end of section B-B.

The surficial sand decreases in grain size from medium sand on the northern slope and crest of Cactus Hill to clayey medium to fine sand on the southern slope. Sorting of the surficial sand is greatest, well to moderately well sorted, at the crest of Cactus Hill and is generally moderate elsewhere on the northern slope. No obvious variations in surficial sand grain roundness were observed in the north-south transects across the site; the grains were generally subrounded to subangular. Initial field inspection suggested that grain roundness may increase eastward, but this has not yet been established by a thorough microscopic analysis.

The distribution and morphology of the surficial sand unit, its medium and fine grain size, and well to moderately sorted nature indicate that the unit is aeolian. The source area of the aeolian sand was the nearby fluvial sand and gravel unit to the northwest. The fining of the medium sand to the south and east supports the aeolian mode of deposition and a source area to the northwest. The mineralogical similarity of the fluvial sand and gravel unit and the surficial sand unit, both of which consist of about 95 percent quartz and 4 to 5 percent feldspar, also supports the fluvial sand and gravel source area. The generally moderate sorting and subrounded to subangular grains are not typical of aeolian dunes whose sediments have been transported long distances. In this case, however, the source area was nearby. Because the grains were not transported a great distance, the resulting accumulation of sediment is neither as well sorted nor as well rounded as it would have been otherwise.

The sand above the paleosol and fluvial sand and gravel unit but below the stratified archaeological sequence has similar textural and mineralogical properties to the sand containing the sequence. The entire surficial sand unit, including the stratified archaeological sequence and its underlying aeolian sands, was probably deposited during the same extended period of aeolian deposition. This indicates that aeolian deposition must have begun before 15,070 years B.P., the date obtained for the base of the archaeological sequence by McAvoy (this volume). No dates have been obtained for the sand sequence below the archaeological sequence because significant amounts of organic material have not yet been recovered. Assuming that the rate of aeolian deposition of the sand below the sequence was comparable to that of the artifact-bearing sand, aeolian deposition may have begun 25,000 to 30,000 years B.P.

Parts of the Cactus Hill site have been carefully excavated and studied by Joseph McAvoy. Dates for horizons in the surficial sand were initially determined by cultural material and later confirmed by radiocarbon dates on carbonized wood. Based on these dates, accretion rates were variable but generally decreased from as much as 1.8 inches (4.6cm) per 100 years in the time interval to 8,900 to 9,100 years B.P. to less than 0.4 inches (1.0cm) per 100 years between 6,000 years B.P. to present (Figure 7 and Table 1).

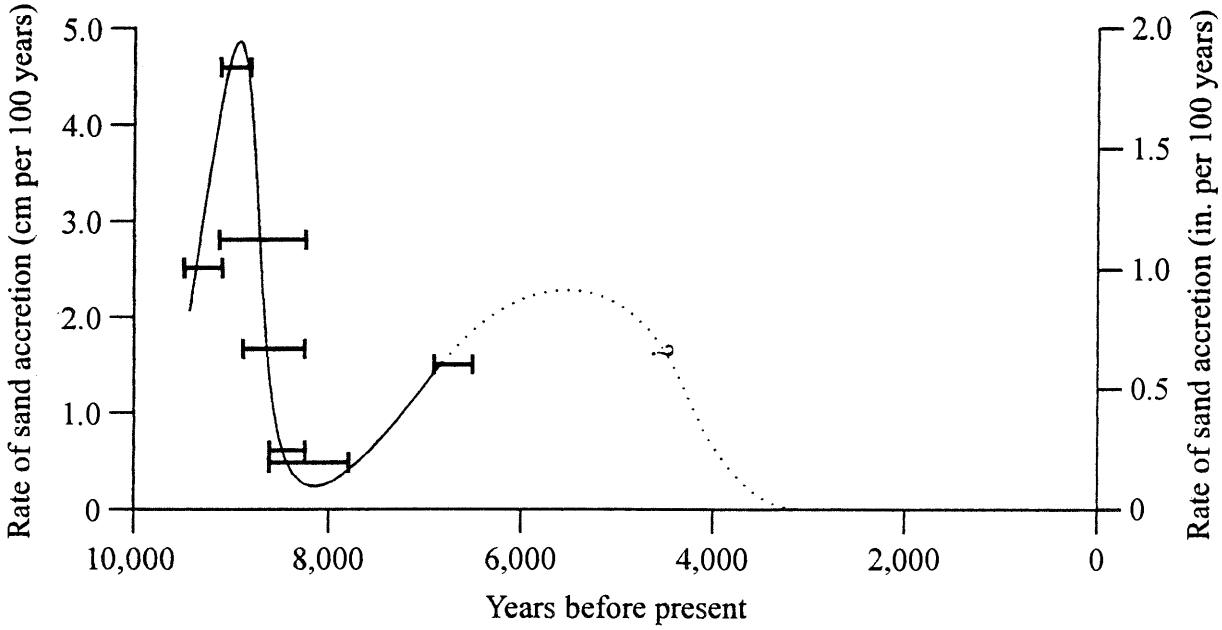

Figure 7. Graph of aeolian sand accretion rate as a function of time. Sand accretion rate intervals are based on radiocarbon dates on carbonized wood (McAvoy, pers. comm.)

Table 1. Average accretionary rates of sand at Cactus Hill.

Time span (B.P.)	Average accretion rate (per 100 years)	Number of samples used in average
6,500-7,000	1.5 cm (0.58 in.)	2
7,800-8,700	0.43 cm (0.17 in.)	3
8,300-8,700	0.64 cm (0.25 in.)	1
8,300-8,900	1.8 cm (0.7 in.)	1
8,300-9,100	2.9 cm (1.13 in.)	1
8,900-9,100	4.6 cm (1.8 in.)	4
9,100-9,400	2.5 cm (1.0 in.)	1

The variable accretion rates of sand probably reflect several different natural and anthropogenic causes. Among potential variables affecting the accretion rate are the availability of sand, prevailing climatic conditions, intensity of local winds, the vegetative cover, frequency of fire, and intensity of human activity on the site.

Because the sandy fluvial deposits, exposed north of the buried scarp, were available for deflation throughout the period of aeolian accretion, the supply of sand for aeolian transport would have been constant or diminished somewhat as sand was selectively removed leaving a lag of material too coarse to be moved by the wind. With the onset of glaciation, during the late Wisconsinan both climatic and vegetative changes occurred. Although it is impossible to prove that these conditions initiated aeolian deposition at Cactus Hill, the estimated timing (25,000 - 30,000 years B.P.) coincides with the probable onset of aeolian deposition.

Stronger, drier winds flowing southward off continental glaciers in the Midwest and New England during Wisconsinan Glaciation probably caused higher rates of aeolian deposition than during the post-glacial period. These rates probably decreased with the retreat of glaciers and establishment of extensive deciduous cover. Natural and man-made fires and intensive human occupation of the site would have reduced or removed surface cover, allowing for the deflation of barren sand. Such a removal of surface cover may have contributed to the high sand accretion rates noted from about 8,900 to 9,100 years B.P.

Human occupation began approximately halfway through the accretion of aeolian sand at Cactus Hill. Although human occupation of the Cactus Hill site may have increased the rate of sand accretion, this occupation could not have initiated aeolian deposition.

GEOLOGIC RECONSTRUCTION

Before the onset of aeolian activity, the landscape at Cactus Hill consisted of a low, east-west trending scarp separating an upland to the south underlain by clayey sand (Figure 8,b) and a lower area to the north underlain by sandy fluvial deposits of the younger Chuckatuck Formation (Figure 8,d). Long before 15,000 years B.P., and possibly 25,000 to 30,000 years B.P., aeolian activity began. The fluvial sand and gravel blanket was deflated and medium and fine sands were blown southward and accreted along the northern edge of the scarp (Figure 8, e). As deflation of the fluvial sediments continued, the aeolian sand eventually overtopped the scarp, capping the clay near the scarp with aeolian sand (Figure 8, f). Thereafter, the earliest human inhabitants migrated to the area, occupied the locally high sand veneered areas, and utilized the lithic resources found on the bed of the nearby Nottoway River.

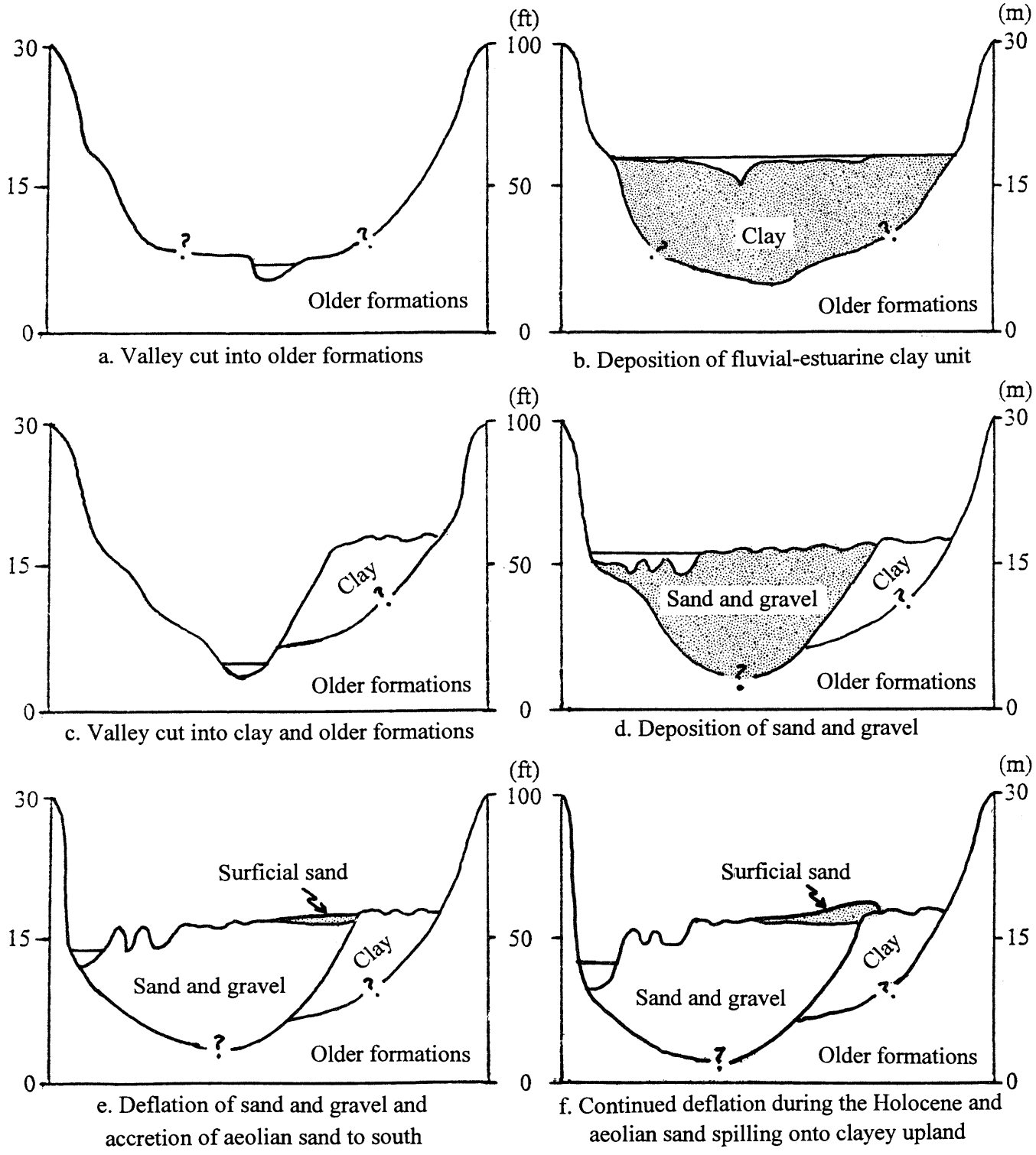

Figure 8. Schematic reconstruction of the geologic history of the Cactus Hill site.

The main part of the Cactus Hill site was, even at the time of earliest occupancy, a well-drained area. By contrast, the linear trough to the south, underlain by clayey soils, was poorly drained and wetter. This trough was apparently also less inhabited because few artifacts have been found there. Since the time of earliest inhabitation, the Nottoway River has eroded and deepened its channel. If the bed of the river was higher then than it is today, the Nottoway could have occasionally flooded the area to the north of Cactus Hill and would have produced a higher water table, making the swale areas around Cactus Hill even more poorly drained than they are today. The occupation of Cactus Hill was centered on the well drained area underlain by interbedded sands and gravels and aeolian sands.

CONCLUSIONS

The topography, distribution, texture, and relationship of the surficial sand to underlying units indicate that this sand is aeolian. The topography at Cactus Hill site from north to south is asymmetrical with the northern slope being gentler than the southern slope. The surficial sand is medium grained and finer, decreases in grain size to the south and east, and is generally well to moderately sorted. Typical aeolian sorting and grain rounding are not present in the surficial sand because the sediment was transported only a few hundred feet from fluvial deposits to the north. The sand was deposited across a fluvial surface, accreted against a north-facing paleoscarp, and spilled onto the edge of the adjacent upland.

Sand accretion rates varied, decreasing from over 1.8 inches (4.6cm) per 100 years about 9,000 years B.P. to under 0.4 inches (1.0cm) per 100 years at present. These rates may have been strongly influenced by early Holocene climatic and vegetative conditions and later by human occupation.

FUTURE WORK

In the forthcoming year, the pre-cultural surficial sand will be carefully searched for dateable organic material in order to establish a date for the onset of aeolian activity at Cactus Hill. Careful geomorphic and stratigraphic studies of the Nottoway channel and area to the west and south would likely help resolve some of the chronologic problems and paleonenvironmental issues.

ACKNOWLEDGMENTS

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APPENDIX D (1)

Uncontaminated Charcoal: Significant Dates and Environmental Reconstruction from the Cactus Hill Site, Nottoway River, Virginia

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Abstract

Radiocarbon dates on charcoal found in the Paleoindian level at the Cactus Hill site initially were younger than expected for that cultural period. Before dating additional samples, the charcoal was analyzed and identified. White pine, which does not grow in the coastal zone today, was identified among the charcoal samples from a level beneath a fluted point level and AMS dated to 15,070 ±70 B. P. Southern hard pine associated with the fluted point component was isolated from incompletely carbonized hickory and was AMS dated at 10,920±250 B. P. It is critical to identify what is submitted for dating for two reasons: First, to assure the sample in not contaminated; second, to know what was growing in the environment at the time period. The presence of white pine followed 4,000 years later by southern hard pine provides critical documentation for a small portion of the late -Pleistocene environment in southeastern Virginia during initial settlement by humans.

Introduction

Working on the Cactus Hill project has been and continues to be an exciting prospect based on the great age and the number of components associated with the archaeological components. When I was first contacted by Joe McAvoy to identify some of the charcoal from the Cactus Hill excavations he expressed dissatisfaction with some of the radiocarbon dates associated with the fluted point component. As an archaeobotanist and paleoecologist, I wanted the opportunity to detect any potential contamination problems with the charcoal sample before it was sent off for dating. The presorting of the sample resulted in a 15,050 ± B. P. uncalibrated date on white pine charcoal and 10,920± B. P. on southern hard pine. The new dates opened up the possibility of a pre-Clovis, blade manufacturing occupation and provided an appropriate date for the fluted point component. In this paper I want to stress 2 things: 1) the value of presorting your carbon samples prior to dating and 2) how you can use the identified charcoal to reconstruct the local environment before it is sent to the radiocarbon lab and disappears into carbon atoms. Then, the identified charcoal and radiocarbon dates will allow you to make environmental interpretations at the spatial and temporal scale appropriate for archaeology. This paper will focus on the late-Pleistocene charcoal and related environmental reconstruction for Cactus Hill. A potential scenario for the Holocene will be included as well. The appendix contains the actual feature designations and sample identifications.

Charcoal from dated archaeological contexts is critical for establishing a link between people and their environment. The archaeobotanist's goal is to document what was available for human consumption and to assess how settlement patterns may have been related to plant resources during different archaeological periods. Plant remains associated with human activities such as cooking, heating, and land clearing are necessary to provide crucial information for interpreting prehistoric lifeways. An association with artifacts such as fire cracked rocks, lithic debris, calcined bone, or ceramic fragments documents the cultural context needed for research.

Methods

Charcoal identification is made using a synoptic collection of wood and charcoal specimens, reference slides, and photomicrographs (Barefoot and Hankins 1982; Core, Côté, and Day 1981; Panshin and de Zeeuv 1980; Pearsall 1989; Schweingruber 1978, 1990). The charcoal samples may be weighed and/or counted for quantification purposes (Popper 1988). However, time and budgets frequently determine the amount of material identified from each sample.

More than one microscope is necessary for identifying charcoal. I use a Zeiss binocular microscope with magnification between 7 and 50X for the initial orientation of wood charcoal as well as examining the cross-section. Fiber optic light sources are used because they project stronger, cooler light for viewing the plant specimens under binocular microscopes. However, an incident light microscope with magnification up to 400X is needed for viewing the tangential and radial sections of the charcoal.

When working with charcoal that is to be radiocarbon dated, care must be taken not to contaminate the pieces. Metal forceps and glass petri dishes and slides are used to hold and mount the fragments for examination. New razor blades are used to section the charcoal. If the fragment does not rest easily on the glass slide, sterile sand can be used to support it in the appropriate view. A small fragment of a difficult to identify specimen may be mounted in plasticine, but these fragments will not be part of the dated sample. In most cases, all of the specimens sent in the 21 samples from Cactus Hill were identified. The results are enumerated in the appendix to this paper. Nomenclature (Table 1) follows Fernald (1970).

Discussion

The Cactus Hill Site is located along the Nottoway River in the Coastal Plain Province of southeastern Virginia. Today, the study area lies along the northern edge of the Southeastern Evergreen Forest Region bordering the deciduous Oak-Hickory Forest (Braun 1950; Delcourt and Delcourt 1987; McAvoy 1992).

The present day vegetation along the river, wetland, and swamp reflects the diversity found in the biome with white, red, and black oak, beech, pignut hickory, and tulip poplar with some red maple, sassafras, dogwood, and possibly black gum trees; the conifers include long leaf and shortleaf pines (Joseph McAvoy, personal communication 1995). The site of the Paleoindian through Archaic settlements at Cactus Hill is located on well-drained sand, while the surrounding area includes a variety of soil conditions creating microhabitats.

Archaeologists have long relied on pollen studies to provide interpretations of the prehistoric vegetation patterns. However, pollen often produces a regional picture of the environment (Carbone 1976; Craig 1969; Kneller and Peteet 1993; Watts 1979; Whitehead 1972,1981; and the overview by Delcourt and Delcourt 1986). When we combine the archaeologically recovered, identified, and dated plant remains with the pollen evidence we have a better opportunity to interpret the local environment associated with the humans who lived there.

West of the Appalachian mountains, researchers report spruce, fir, larch, and early hard wood pollen during the late-Pleistocene. Conifer and deciduous macrofossils such as white spruce, walnuts, hickory nuts, acorns, hazelnuts, and beechnuts were found in association with a 17,000 year old mastodon burial site in Tennessee (Delcourt and Delcourt 1984:24). The Delcourts surmise that cold glacial meltwater flowing south in the Mississippi cooled the adjacent land, and the warmer Gulf Stream air produced fog and subsequently a humid environment. This scenario apparently provided the necessary conditions for a full glacial refugium for mesic temperate flora (Delcourt and Delcourt 1984:24). The significance for this paper is the suggestion that similar refugium may have existed along "other major river systems of the southeast," (Delcourt and Delcourt 1984: 24).

Pollen (Table 2) was recovered from Saltville Valley, Virginia, in the Ridge and Valley Province at 1722' elevation (Delcourt and Delcourt 1986). Based on the pollen, jack pine, aspen, tree birch, and oak grew there over 15,000 years ago along with maple, beech, hickory, elm, and cherry (Delcourt and Delcourt 1986). The Delcourts (1986) interpreted that red spruce, balsam fir, and larch grew in the bottomlands, while open areas contained shrubs, grasses, and sedges typical of a boreal community (Table 2). However, there is no mention of white pine which was found along the Nottoway River, suggesting southeastern Virginia may have been a glacial refugium for that species, and a migration lag may be indicated.

Looking north up the Ridge and Valley, cores from Brown's Pond contained pollen (Table 3) from the haploxylon and diploxylon pines 17,000 ago. Macrofossils from a 2 needle pine suggest jack, red , pungent, virginia, or shortleaf pine may have grown locally. Spruce and small amounts of fir, oak, birch, and alder pollen were also reported. Still no mention of white pine; however, oak was there.

This is a good place to argue for extending our perceptions beyond general overviews of the environment. For instance, archaeologists have been interpreting the environment based on the major pollen contributors. However, this has obscured the broader picture that can be derived by looking at the *low* pollen contributors such as larch, fir, maple, hickory, and all of the insect pollinated species as well. You may be surprised to learn that during the Oak/Hickory zone, hickory pollen remained below 5%.

Today, white pine grows in the Appalachian Mountains (Burns and Honkala 1990), and it is not a native in coastal forests. Clearly, the charcoal from Cactus Hill, AMS dated to 15,070 B. P., confirms that white pine was along the Nottoway River drainage during the late Pleistocene period possibly favoring more ameliorated sites than the jack or red pines reported elsewhere. According to Fernald (1970), jack pine prefers barren, sandy, or rocky soil, but white pine grows on a variety of soil types and can survive in wetlands and on dry ridges. White pine colonizes open fields and swamps within its range. It extends into regions where the average January temperature reaches -6°C, and at its northern extent grows close to the boundary for northern red oak, red maple, and black ash. Based on the conifer and temperate deciduous pollen spectra from Saltville Valley at 1722' and Brown's Pond at 2030', and the local occurrence of white pine, there is every reason to believe that 15,000 years ago, if humans were living at Cactus Hill, it is conceivable that they had beechnuts, hickory nuts, acorns, fruits such as cherries and raspberries, other seeds, plus tree and

shrub products such as bark and roots available for human and animal consumption. Comparing this scenario with that dominated by the conifer traditionally emphasized from the pollen spectra, it appears that southern Virginia, and Cactus Hill in particular, provided a very hospitable environment.

Based on some of the regional pollen evidence, the oak charcoal and charred hickory nutshells being recovered from the strata 12 inches below the fluted point levels may not be the result of bioturbation. Considering that the white pine dates to 15,000 B. P., it would be worthwhile to AMS date some of these allegedly aberrant specimens to gain a better understanding of the local prehistoric environment and site taphonomy.

Other charcoal samples from the "Clovis" area included material from several different units. Southern hard pine and hickory came from a hearth in Square 1/9, level 5. The hickory was not completely carbonized; it was removed from the sample prior to dating so it would not contaminate the process. Then, the southern hard pine was AMS dated to 10,920± B. P. This date was more appropriate for the fluted point level and relates well with the influx of southern hard pines presented in the regional pollen spectra.

Southern hard pine includes several species. Those which have distribution in Virginia today include loblolly, shortleaf, and Virginia pine. (The following modern growth ranges and conditions are from Burns and Honkala 1990). Loblolly pine grows along the Atlantic coastal plain and extends into the Piedmont region. It is scarce in the coarse sands in the coastal plain, but will grow in the uplands and along flood plains and river terraces in the Coastal Uplands. It prefers humid, warm, temperate climate with long, hot summers and mild winters. The growth range for Virginia pine is more restricted, and could possibly grow near the Cactus Hill area today. Based on late-Pleistocene range patterns, Virginia pine could have been at the site during the late Pleistocene.

Shortleaf pine prefers humid conditions, and average annual temperatures range from 48°F to 70°F. Some of the best growing conditions are found on flood plains with deep, well-drained soils of fine sandy loam. However, shortleaf pine is quickly replaced by competing hardwoods. Common, modern associates of the short leaf pine include scarlet oak, southern red oak, blackgum, sweetgum, pignut hickories, winged elm, sourwood, red maple, water oak, willow, American beech, and Carolina ash. The understory trees and shrubs may include mountain laurel, flowering dogwood, redbud, persimmon, and eastern red cedar. This community may be indicative of the potential vegetation and succession occurring at Cactus Hill during the late Pleistocene and early Holocene.

In terms of succession, southeastern Virginia may have been a focal point of rapid vegetation changes east of the Appalachians during the late Pleistocene. By 13,000 B. P. more northerly sites, albeit west of the Appalachians, contained admixtures of pollen and macrofossils from spruce, fir, and larch, along with oak, ash, elm, hazel, maple, and hickory. A 13,000 year old bone bed from central Indiana contained mastodon, caribou, and giant beaver remains, along with the eclectic mix of pollen (Whitehead et al.. 1982). Similar pollen assemblages have been found in Illinois (Gruger 1972, cited in Whitehead et al. 1982), Ohio (Shane 1980; 1987) and northern Indiana (Bailey 1972, cited in Whitehead et al 1982) by 13,000 B. P. However, at this time an arctic-like tundra environment persisted in southern New England (McWeeney 1994), on the Allegheny Plateau in West Virginia and in Pennsylvania (Watts 1979), as well as at higher elevations in the Blue Ridge and Appalachian Mountains (Delcourt and Delcourt 1981). However, based on the white pine growing along the Nottoway River, and the record for temperate pollen in the Ridge and Valley Province, the Delcourt's (1986) suggestion that a pine-spruce taiga existed along the Atlantic Coastal Plain may need to be reclassified to a conifer /hardwood forest. Certainly by 12,000 B. P., when a warming period saw the migration of white pine into Connecticut (McWeeney 1994), there should be no difficulty accepting a mesic temperate forest at Cactus Hill.

The white pine may have migrated westward as climate changed and been replaced by southern hard pine by the time the fluted point users ("Clovis") occupied the Cactus Hill Site. Southern hard pine charcoal was identified from the 10,920± B. P. hearth found in level 5 from area B square - 1/9, N10W7. Southern hard pines found in Virginia include Loblolly pine (*Pinus taeda,*), shortleaf pine (*Pinus echinata*), or Virginia pine (*Pinus virginiana*). (The following growth range and conditions are from Burns and Honkala 1990).

The growth range for loblolly pine extends from southern New Jersey to central Florida along the Atlantic coastal plain into the Piedmont. It is scarce in the coarse sands in the coastal plain, but will grow in the uplands and along flood plains and river terraces in the Coastal Uplands. Loblolly pine prefers a humid, warm, temperate climate with long, hot summers and mild winters.

Shortleaf pine grows from southeastern New York to northern Florida and west into Texas. It prefers humid conditions but tolerates a variety of conditions. The average annual temperature ranges from 48°F to 70°F. Some of the best growing conditions are found on flood plains with deep, well-drained soils of fine sandy loam. Shortleaf pine is replaced by competing species such as hardwoods. Common associates of short leaf pine include oaks, hickories, sweet and black gum, elm, maple, beech, and ash. The understory trees and shrubs may include mountain laurel, flowering dogwood, redbud, persimmon, and eastern red cedar (Table 2).

The growth range for Virginia pine is much smaller than shortleaf pine, extending into New Jersey, southern Pennsylvania, and south into northern Georgia, Mississippi, and Alabama. It may grow near the Cactus Hill area in southeastern Virginia. The modern proximity suggests that Virginia pine could have been at the site during the late Pleistocene considering the range extension already identified for the white pine.

The other charcoal from the "Clovis" area included material from several different units. Southern hard pine, and an indistinguishable conifer and hickory came from square 1/9, level 5. The hickory was not completely carbonized and was interpreted to be a contaminant.

Holocene

The remaining charcoal samples all came from Holocene period occupations. Oak and hickory pollen along with other deciduous tree pollen unquestionably increased during the Holocene period and the preference for these woods is echoed in the charcoal assemblage. Several specimens dated between 8,800 and 9,800 yrs B. P. Oak was identified in a mixed sample from area B, Square 1/9, which collectively dated to 9,790 yrs B. P. Oak and hickory were found in square 2/9. Area D had a similar assemblage of oak and hickory with the addition of conifer wood, some of which was identified as southern hard pine. Identification of the samples (5-9B) dating approximately between 8,000 and 6,000 yrs B. P., indicates that oak and hickory were prime sources for fuel during the Middle Archaic period. Oak and hickory continued to be the choice for fuel into the Late Archaic. Common, modern associates of the possible white oak group trees found in Virginia are listed in Table 3. The variety of trees and shrubs found with oaks today indicates that a diverse assemblage of plants, and the animals they attracted could have been available to prehistoric inhabitants at Cactus Hill.

Hunting

Reconstruction of the plant environment also lends itself to hypothesizing about the faunal community. For this paper, I will focus on the ungulates long thought to be Paleoindian prey, the caribou (*Rangifer tarandus*). In particular, there has been a predilection to see the eastern fluted point users as caribou hunters (Funk et al. 1970; Johnson 1996). According to Spiess (1979), the woodland caribou lived in the northern Maine conifer hardwood forest up until the early 1900s. A mature spruce-fir forest with beech, maple, and rare oak was the adopted habitat for these animals. The key word here is "mature," and this is based on the caribou's lichen based diet (Edwards 1954). In British Columbia, "Tree moss" that grows on spruce and fir branches, and rock lichens, which are not found above the treeline, are the major food resources for the mountain caribou (Edwards 1954). The environment in the unglaciated southeast supported mature pine, spruce, larch, and fir trees during the glacial maximum. However, as temperatures ameliorated and the glacier receded, rapid vegetation changes occurred on newly exposed landscape with major migratory shifts throughout the east. A vast tundra-like region emerging in southern New England by 15,000 B. P. (McWeeney 1994) may have drawn the migrating caribou northward. As the spruce, fir, white pine, and larch migrated northward from the southeast (Davis 1978; Kneller and Peteet 1993), admixtures of oak, hornbeam, ash, elm, beech, and maple also colonized the landscape reaching southern New England by 12,000 B. P. Imagine the shifting vegetation pushing the caribou and other cold adapted fauna further north in latitude as they

depleted their spatially limited, favored habitats at higher elevations.

If spruce and fir persisted in the mountains at Saltville Valley around 15,000 B. P., we can only ponder how long the lichens and other critical food sources survived intense predation by relict herds of caribou. According to Lindsay (1973:107) trampling and eating lichen destroys the plants and "can totally transform the nature of the vegetation in a very short time." It may take more than a decade for regeneration; recovery can take over 30 years in Antarctica (Lindsay 1973). In the southeastern United States, where temperatures were warming and vegetation zones were shifting, the open ground once covered by lichens and herbaceous plants would have been replaced by meadows, shrubs, and trees. High canopy deciduous trees would have replaced shade intolerant conifers. It becomes clear that the major caribou population would have been forced to move northward where their preferred vegetation was expanding in the wake of the glacier. It may have been during these major environmental shifts that some of the *Rangifera tarandus* survived by adapting to forests, becoming the woodland caribou population that lived in Maine up until 100 years ago.

If humans were here, caribou hunting may have been possible in the Appalachian mountains around 15,000 B. P. By 12,000 years ago, a few small, relict groups of caribou migrating through the Appalachian Mountains and along the Ridge and Valley Province may be all that survived in the south. There are only three late Pleistocene caribou bone sites in Virginia, and those are located in the mountains (Lundelius et al. 1983).

Many other mammals, now extinct or no longer native to Virginia, populated the Southeast during the late Pleistocene. At the salt springs in Saltville Valley, ground sloths, mastodon, mammoth, musk-ox, elk or moose, and bison bones were discovered along with the caribou (Lundelius et al. 1983). Dates on individual taxa would clearly help to refine when various environmental transitions occurred to support the different animals (or the attraction of the salt seeps may have overridden vegetation zones). Undated bison remains also have been discovered in three Coastal Zone sites and occasionally off-shore on the Continental Shelf (Lundelius et al. 1983). When the environment deteriorated 11,000 years ago, during the Younger Dryas episode, any relict caribou herds in the Appalachian Mountains could have migrated to lower elevations as seasonal extremes, higher snow packs, and lowered snowlines prevailed for 1,000 years. A similar scenario has been demonstrated for late Pleistocene *Rangifera* assemblages in the southwestern European mountains, where archaeological deposits indicated that animals migrated vertically between winter and summer feeding grounds (Delpech 1983 and Altuna and Mariezkurrena 1993 as cited in Strauss 1996: 91). As the caribou herds migrated north, the mountainous regions may have been their only refuge while the environment ameliorated in the lowlands. It is likely that white-tailed deer and elk filled the gap left by the caribou in the southeast, but that scenario awaits paleontological and archaeological verification.

Conclusion

The charcoal identification has proved to be valuable beyond providing evidence for the presence of certain plants in the prehistoric environment. We can also learn something about human patterns such as the inhabitants at Cactus Hill had a strong preference for oak, hickory, and pine for fuel.

One of the most significant results from the charcoal analysis came from the presorting of the material to be AMS dated from the "Clovis level." I was able to determine that many fragments of charcoal had not been completely carbonized, suggesting they may have been modern contaminants. When the hearth charcoal found in "Clovis level 5" was redated using completely carbonized southern hard pine specimens, the date came back about 1,000 years older than the first date changing from 9,790 to 10,920 B. P. In a similar examination from Area B Square 2/9, the completely carbonized fragment of white pine was AMS dated to over 15,000 years old.

Based on this environmental reconstruction for southeastern Virginia during the late Pleistocene, it is unlikely that herds of woodland caribou were living near to the Cactus Hill site when the first settlers arrived there. It is more likely that the attraction to the site was the ameliorated environmental surroundings along the river and a mosaic of plant and animal resources.

Table 1. Latin names from plants mentioned in text

DECIDUOUS TREES	LATIN NAMES
striped maple	*Acer pennsylvanicum*
red maple	*Acer rubrum*
sugar maple	*Acer saccharum*
birch, shrub type	*Betula glandulosa* type
birch, tree	*Betula* spp.
pignut hickory	*Carya glabra*
hickory	*Carya* spp.
hawthorn	*Crataegus spp.*
persimmon	*Diospyros virginiana*
American beech	*Fagus grandifolia*
American ash	*Fraxinus americana*
Carolina ash	*Fraxinus caroliniana*
black ash	*Fraxinus nigra*
green ash	*Fraxinus pennsylvanica*
mountain laurel	*Kalmia latifolia*
sweetgum	*Liquidambar styraciflua*
tulip (yellow) poplar	*Liriodendron tulipifera*
southern magnolia	*Magnolia* spp.
black gum	*Nyssa sylvatica*
sourwood	*Oxydendrum arboreum*
balsam poplar	*Populus balsamifera*
aspen	*Populus tremuloides*
cherry	*Prunus* spp.
white oak	*Quercus alba*
scarlet oak	*Quercus coccinea*
southern red oak	*Quercus falcata*
black oak, water oak	*Quercus nigra*
willow oak	*Quercus phellos*
honey locust	*Robinia pseudoacacia*
sassafras	*Sassafras albidum*
basswood	*Tilia americana*
elm	*Ulmus* spp.
winged elm	*Ulmus alata*
CONIFER	
balsam fir	*Abies balsamea*
eastern red cedar	*Juniperous virginiana*
larch/tamarisk	*Larix laricina*
jack pine	*Pinus banksiana*
shortleaf pine	*Pinus echinata*
loblolly leaf	*Pinus taeda*
Virginia pine	*Pinus virginiana*
hemlock	*Tsuga canadensis*
spruce	*Picea* spp.
tree moss	*Alectoria sarmentosa*
rock lichens	Cladonia spp

UNDERSTORY	LATIN NAMES
devil's walking stick	*Aralia spinosa*
pawpaw	*Asimina triloba*
American hornbeam	*Carpinus caroliniana*
sugarberry	*Celtis laevigata*
redbud	*Cercis canadensis*
flowering dogwood	*Cornus florida*
swamp privet	*Forestiera acuminata*
mountain laurel	*Kalmia latifolia*
willow	*Salix* spp.
southern arrowwood	*Viburnum dentatum*
possumhaw viburnum	*Viburnum nudum*

Table 2. Vegetation reported for Saltville Valley

Date	Conifer Pollen	Deciduous Pollen	Macrofossils
>15,000	pines : haploxylon (jack pine) spruce fir larch	oak birch aspen maple beech hickory elm cherry	
12,000	pine spruce fir decreasing	oak hornbeam ash maple hickory elm willow increasing	

(adapted from Delcourt and Delcourt 1986)

Table 3. Vegetation reported for Brown's Pond

Date Yrs BP	Conifer Pollen	Deciduous Pollen	Other Pollen	Macrofossils
17,345 to 14,090 Zone BR-1	pines : haploxylon and diploxylon spruce (black and white) fir	oak birch alder (speckled)	Canadian burnet Tubuliflorae meadow rue wormwood quillwort sedges	2 needle pine= jack, red, pungent, virginia, and/or shortleaf spruce fir alder buckbean violet pondweed stonewort quillwort spores
14,000 to 12,810 Zone BR-2a	pine spruce fir	Alder dominates oak ±2% birch	sedge quillwort water lily	spruce fir larch alder raspberry St. Johnswort violet buckbean sedges water lily
12,810 to 10,950 Zone BR-2b	pine spruce fir influx rates decrease degradation of pollen	alder hornbeam oak ± 5%		 decrease in #
10,950 to 9,240 Zone	pine spruce fir	alder oak up to 20% hornbeam 15% hazel 6%	sedge Tubuliflorae ferns	only quillwort

Table 4. Modern associates of the short leaf pine

COMMON NAME	LATIN NAME
red maple	*Acer rubrum*
pignut hickories	*Carya glabra*
American beech	*Fagus grandifolia*
Carolina ash	*Fraxinus caroliniana*
sweetgum	*Liquidambar styraciflua*
blackgum	*Nyssa sylvatica*
sourwood	*Oxydendron arboreum*
short leaf pine	*Pinus echinata*
scarlet oak	*Quercus coccinea*
southern red oak	*Quercus falcata*
water oak	*Quercus nigra*
willow	*Salix* spp.
winged elm	*Ulmus alata*
UNDERSTORY	
redbud	*Cercis canadensis*
flowering dogwood	*Cornus florida*
persimmon	*Diospyrous virginiana*
eastern red cedar	*Juniperous virginia*
mountain laurel	*Kalmia latifolia*

Table 5. White oak group associated plants in Virginia

ASSOCIATES	WATER OAK	WHITE OAK	SWAMP CHESTNUT OAK	WILLOW OAK
white oak		x	x	
water oak	x		x	x
post oak			x	
ash	x	x	x	
American beech	x	x	x	
American basswood		x		
blackgum	x	x	x	
cottonwood				x
elm	x	x	x	x (cedar elm)
hawthorn				x
hickories		x	x	
honeylocust	x			
red maple				x
sugar maple		x		
southern magnolia			x	
persimmon				x
yellow poplar	x	x	x	
sweetgum	x	x	x	
CONIFERS				
loblolly pine	x	x		
shortleaf pine		x		
white pine		x		
eastern hemlock		x		
UNDERSTORY				
American hornbeam	x		x	
dogwood	x		x	x
devil's walking stick			x	
pawpaw			x	
sugarberry	x			
swamp privet	x			
willow			x	
southern arrowwood			x	
possumhaw viburnum			x	

Hopefully, this presentation has convinced you of the value in examining your botanical samples prior to sending them for radiocarbon dating. Presorting and identification of plant macrofossils can prevent mixing with modern contaminants and provide more reliable environmental documentation.

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Attachment

to

Uncontaminated Charcoal: Significant Dates and Environmental Reconstruction from the Cactus Hill Site, Nottoway River, Virginia

Report on the Charcoal Remains from the Cactus Hill Site, Nottoway River, Virginia

Prepared by

Lucinca McWeeney

Peabody Museum, Yale University

REPORT ON THE CHARCOAL REMAINS FROM THE CACTUS HILL SITE, NOTTOWAY RIVER, VIRGINIA

Prepared by Lucinda McWeeney, Ph. D.
Archaeobotanist
June 1995

INTRODUCTION

Thirty-one sample packages of wood charcoal from the Cactus Hill Site, 44SX202, were sent to be identified to genus and or species level of classification. Each package had a different number of specimens ranging from 1 piece to over 100 fragments. The dates provided are all in radiocarbon years before present (BP). The specimens came from :

Area B

Feature 1	Sq. -1/9	level 5	10,920+/-250 on hard pine
Silt bands	Sq. 2/9	level 5	9,155+/-80 mixed sample
Hearth	Sq. 2/9	level 6	15,070+/70 on white pine
Feature 1	Sq. -1/14	level 2-3	4,980+/-170 from level w/ Shouldered Guilford point
Test Excav.V	6/1992	level 4	ca. 8600-8800 St. Albans-Nottoway Ft.

Area D

Feature 1	Sq. N1E2	level 3	ca. 8,800 Ft. Nottoway
Feature 1	Sq. N1E2	level 3	(Space adj. to Fea. 1) ca. 8,800 Ft. Nottoway
Feature 4	Sq. N2E1	level 2	ca. 6,500, Morrow Mt.II
Feature 6	Sq. N2E1	level 6	8,800+/-120 Ft. Nottoway
Feature 4	Sq. N2E2	level 3	Kirk stemmed level, hearth intrusive, 5,180+/-60
Feature 2	Sq. N0E0	level 2	ca. 6,500, Morrow Mt.II
General area	Sq. N0E0	level 4	LeCroy ca. 8,300
Feature 2/9	Sq. N5E4	level 2	4,850+/-70 Halifax (?)
Feature 9/2	Sq. N5E4	level 3-8	4,850+/-70 Halifax (?)
Feature 8	Sq. N5E4	level 3	4,070+/-80 Lt. Archaic
Feature 16	Sq. N5E4	level 5	ca.8,000 Kirk Serrated(?)
Feature 19	Sq. N5E4	level 5	ca.8,000 Kirk Serrated
Feature 22	Sq. N5E4	level 7	9,240+/-190; 9,140+/-50 Decatur
Non-feature	Sq. N5E4	level 8 west	ca. 9,100-9,500 Kirk-Palmer
Feature 23	Sq. N5E4	level 8 north	ca. 9,100 Kirk corner notched
Feature 24	Sq. N5E4	level 8	8,940+/-60 Palmer-Ft. Nottoway(?)
Test Excav. H 11/1990 30" B.S.			ca. 9,000 Decatur

In most cases, all of the specimens in the 31 samples from Cactus Hill were identified. It is my understanding that the sample packages did not contain all of the charcoal from the unit. When the number of specimens exceeded 12-14, the sample was randomly divided into quarters either by weight or number. For example, Sample 5C had 138 fragments of charcoal and specimens from 1/4 of the weight were identified. Sample 8, Feature 8 and Sample 11B, Feature 1 were poured over a + grid and the northwest quadrangle was identified for each sample. Sample 22 had 22 fragments, initially 12 were identified, and all but one was the same taxa; I examined the remaining specimens to look for any mixing.

Specimens that required detailed examination were mounted on plasticine. When the identification was complete the specimen was placed into gel capsules. DO NOT USE THE SPECIMENS IN GEL CAPSULES FOR DATING PURPOSES.

Definitions

Early wood (EW) - part of the growth ring that grows during the spring.
Late wood (LW) - part of the growth ring that grows during the summer.
Resin canals (RC) - tubular, intercellular space, bearing resin in the sapwood; normally found in pine, larch, and spruce in the Pinaceae.
Tracheids - fibrous lignified cell with bordered pits; long in conifers (up to 7 mm), shorter in hardwoods (Angiosperms), usually not more than 1.5 mm.
Parenchyma - tissue consisting of short cells generally with simple pits; primarily for storage and distribution of carbohydrates.
Ray - ribbon-shaped strand of tissue extending in radial direction across the grain.
Ray tracheid (RT) - horizontal ray cells with bordered pits and devoid of living contents, found in wood rays of some softwoods (conifers).
Dentate ray tracheid - ray tracheids with tooth-like projections on the interior walls of the cells; diagnostic feature in the hard pines.
Ray parenchyma (RP) - parenchyma included in rays; form the rectangular or irregular area of common wall between a ray parenchyma cell and a longitudinal tracheid (cross-field).
Pinoid pitting - a term used for the smaller types of early wood cross-field pits found in several species of pine.
Cross-field - the common wall area between an axial cell and a ray cell; this term is most commonly applied to conifers.
Ray types - uniseriate ray - one ray cell wide multiseriate ray - more than one ray cell wide wide ray - oak-type rays with > 13 ray cells.

Abbreviations Used in Text

cf - closely favors.
poss. - the identification is possibly that genus and/or species.
prob. - the identification is probably that genus or species, but not all of the structural components were found due to the small size or deterioration.
WOG - white oak group, subgenus division
ROG - red oak group, subgenus division.

NCC - not completely carbonized.
mm - millimeters.
cm - centimeters.
g - grams.
B. S. - below surface.
BP - radiocarbon years before present.

RESULTS

The identification results are presented in tabular form and in numerical order by sample number in Tables 1 and 2.

Table 1. Cactus Hill Site, 44SX202, Identification Results Area B, Squares 2/9, 1/9, -1/9.

Submittal #2, Clovis Levels Sample #/Square	Carbon Sample Grid Position/wood Type	Comments	Date
1 / 2/9	N10W5 Level 5		
	1 oak	late-wood	
2 / 2/9	N13W10 Level 5		
	3 oak 1 unknown		
3 / 2/9	N9W10 Level 7		
	cf hickory	NCC	
4 / 2/9	N7W0 Level 7		
	unknown	deteriorated NCC	
5 / 2/9	N11W19 Level 6	carbon scatter hearth?	15,070+/-70 BP
	3 white pine	window-like cross-fields	
6 / 2/9	N8W0 Level 5		
	unknown	deteriorated NCC	
7 / 1/9	N4W0 Level 5		
	unknown	Deteriorated NCC	
8 / -1/9	N-10W7 Level 5	Clovis hearth	10,920+/-250BP on hard pine

Table 1. Cactus Hill Site, 44SX202, Identification Results Area B, Squares 2/9, 1/9, -1/9.

Submittal #2, Clovis Levels Sample #/Square	Carbon Sample Grid Position/wood Type	Comments	Date
8 / -1/9 (cont'd)	1 hard pine 1 unknown 1 conifer	angiosperm	
9 / 2/9	N13W8 Level 6		
	1 cf hickory 1 cf oak 1 unknown	all NCC	
10 / 2/9	N12W8 Level 6		
	1 conifer 1 unknown		

Table 2. Cactus Hill Site, 44SX202, Identification Results Areas B and D, General Sample Submittal.

Submittal #1, Sample # Site Area	Excavation Unit and Level/Wood Type	Comments	Date
1 Area B	-1/9 Level 5		9,790+/-200 BP
	1 oak 1 unknown		
2A Area B	2/9 Level 5 silt bands	mixed sample of charcoal	9,155+/-80 BP
	3 cf oak 3 cf hickory 2 unknown	deteriorated NCC, lignified	
2B Area D	N5E4 Level 8 Feature 24	Palmer or Fort Nottoway	8,940+/-60 BP
	3 oak 4 cf oak 3 conifer 2 unknown		
3A Area D	N5E4 Level 8 Feature 23	Kirk Corner Notched	
0.4 g	1 oak - WOG 1 oak - ROG 3 cf oak 1 cf hickory 2 hickory nut 2 hard pine 3 unknown	deteriorated	

Table 2. Cactus Hill Site, 44SX202, Identification Results Areas B and D, General Sample Submittal.

Submittal #1, Sample # Site Area	Excavation Unit and Level/Wood Type	Comments	Date
3B Area D	N5E4 west Level 8 general area	Kirk Corner Notched & Palmer	ca. 9,100 to 9,500 BP
	4 cf oak 7 hickory	lignified	
4A Area D	N5E4 Level 7 Feature 22	Decatur & Palmer	9,240+/-190 BP
	3 oak 1 hickory 5 pine family 1 hard pine 4 unknown	2 WOG, 1NCC	
4B Area D 11/1990	Test Esc. H Level -30" BS	Decatur	ca 9,000 BP
	2 cf oak 2 cf hickory	distorted distorted	
5A Area B **Test Exc. V**	0/22 Level 4 6/20/94	Fort Nottoway /St. Albans	
	1 oak - WOG		
5B Area D	N1E2 Level 3 Feature 1	Fort Nottoway	
		50% nutshell (J. McAvoy)	
	3-4 oak 1-2 hickory 1 conifer	some of the oaks and hickories could not be ruled out by vessel pattern	
5C Area D	N2E1 Level 6 Feature 6 Pit into level 7 (Hearth)	Fort Nottoway	8,800+/-120 BP
138 frgs. quarter sample by wt.	4 oak 5 hickory 5 unknown	deteriorated	
5D Area D	N1E2 Level 3 Adj. to Fea. 1	Fort Nottoway	
	6-8 oak - WOG		
6 Area D	N0E0 Level 4	LeCroy	ca. 8,300 BP
	3 oak - WOG 3 hickory		
7A Area D	N5E4 Level 5 Feature 19	Kirk Serrated	ca. 8,000 BP
	8 oak - ROG 2 hickory 3 unknown	NCC	

Table 2. Cactus Hill Site, 44SX202, Identification Results Areas B and D, General Sample Submittal.

Submittal #1, Sample # Site Area	Excavation Unit and Level/Wood Type	Comments	Date
7B Area D	N2E2 Level 3 Feature 4	Kirk Serrated/ intrusive feature	ca.8,000 BP/ 5,180±60 BP
<0.1 g	2 cf oak 6 hickory nut		
7C Area D	N5E4 Level 5 Feature 16 Hearth	Kirk serrated	ca. 8,000 BP
<0.2 g	6 oak 5 hickory 1 unknown	some NCC	
8 Area D	N5E4 Level 3 Feature 8	Late Archaic Stemmed	4,070+/-80
Quarter sampled on grid	12 oak - WOG		
9A Area D	N0E0 Level 2 Feature 2	Morrow Mt. II hearth	ca. 6,500 BP
	6 oak - WOG		
9B Area D	N2E1 Level 2 Feature 4	Morrow Mt. II hearth	
<0.1 g	4 oak - ROG 4 hickory		
10 Area B Salvage	Exc."C" Level 2-3 Feature 1	Guilford (Shouldered) hearth	4,980+/-170 BP
		96% hickory nut (J.McAvoy)	
	6 maybe oak	deteriorated	
11A Area D	N5E4 Level 3-8 Feature 9	Halifax (?) Pit hearth	4,850+/-70 BP
sampled 12 of 22	11 oak 1 unknown	> 200 g. hickory nut	
examined remaining	8 oak 2 unknown	(J.McAvoy)	
11 B Area D	N5E4 Level 2 Feature 1	Halifax (?) Pit hearth	4,850+/-70
1/4 (NW) quad sampled	11 oak - WOG 1 poss. hickory nut frg.		

APPENDIX D (2)

UNIVERSITY OF KENTUCKY

Research and Graduate Studies

Program for Cultural Resource Assessment
101 American Building
Lexington, Kentucky 40506-0100
606-257-1944

June 28, 1994

Mr. Joseph M. McAvoy

Nottoway River Survey
5861 White Oak Road
Sandston, VA 23150

Dear Mr. McAvoy:

Enclosed are the results of my analysis of the plant samples from the Cactus Hill site. I have identified and quantified the nut and seed remains. Unfortunately, the wood fragments were all quite small. After several attempts, I decided that they were too small to make reliable identifications. I would also note that the nut remains (as is typical for most nutshell from archaeological sites) are too fragmentary for identification beyond the genus level.

The plant food assemblage from the Paleoindian(?) contexts at the Cactus Hill site is quite similar to assemblages from Early and Middle Archaic sites in the eastern U.S. For a good synthesis of patterns of plant food use in the Southeast, you might want to refer to the article by Richard Yarnell and Jean Black in *Southeastern Archaeology* (see reference below).

I have enclosed an invoice for my work and have put the samples in the mail to you.

Sincerely,

C. Margaret Scarry

C. Margaret Scarry, Ph.D.
Staff Archaeologist/Archaeobotanist

Yarnell, Richard A., and M. Jean Black
1985 Temporal Trends Indicated by a Survey of Archaic and Woodland Plant Food Remains from Southeastern North America. *Southeastern Archaeology* 4(2):93-106.

Archaeological plant remains from site 44SX202.

Provenience	Wood	Hickory *Carya* sp.		Acorn *Quercus* sp.		Other		Residue
	Weight	Count	Weight	Count	Weight	Plant/Count	Weight	Weight
2/9-1 Level 5 Sample B	0.04	14	0.11					0.17
2/9-1 Level 7 Sample A	0.24							
2/9-1 Level 7 Sample C	0.10							
2/9-2 Level 5 Sample A	0.03							
2/9-2 Level 5 Sample B	0.02							
2/9-2 Level 5 Sample D	0.03							
2/9-2 Level 5 Sample E	0.07	2	0.02					
2/9-2 Level 5-7 Sample C	0.23	12	0.15			2 persimmon seeds *Diospyros virginiana*	0.06	
2/9-3 Level 7 Sample 3	0.27	390	4.05			1 persimmon seed *Diospyros virginiana*	0.02	2.23
2/9-4 Level 5 Sample A Palmer point	0.12	185	2.62					1.12
2/9-4 Level 5 Sample B within 2" of Clovis	0.08	104	1.68					0.50
2/9-4 Level 5 Sample C next to Clovis	0.05	77	0.93					0.23

Archaeological plant remains from site 44SX202.

Provenience	Wood	Hickory *Carya* sp.		Acorn *Quercus* sp.		Other		Residue
	Weight	Count	Weight	Count	Weight	Plant/Count	Weight	Weight
N2E1 Level 1	3.33	2908	70.51					0.19
N2E1 Level 2	1.22	235	6.36			1 wolfberry *Eleagnus* sp.		0.18
N2E1 Level 3	2.39	424	11.54			1 unid. seed 1 acorn meat *Quercus* sp.	0.05	0.34
N2E1 Level 4	1.79	300	7.03			1 cleaver seed *Galium* sp.		0.19
N2E1 Level 4 Palmer hearth	1.01	258	4.59					0.26
N2E1 Level 5	5.37	1042	25.13	2	0.01	2 unid. seed		2.10
N2E1 Level 6	5.23	471	9.78	9	0.05			1.43
N2E1 Level 7	1.13	2	0.02	15	0.06	1 pine cone	0.01	
N2E1 Level 8	1.20	5	0.04	13	0.04	2 acorn meat *Quercus* sp.	0.03	
N2E1 Level 9 ^{14}C 8800±120 BP	0.43			5	0.02			
N2E1 Level 9 ^{14}C 8800±120 BP	0.34							

APPENDIX D (3)

Archaeobotany of the Cactus Hill Site, 44SX202, Sussex County, Virginia

By
Cheryl A. Holt

INTRODUCTION

There are diverse and complicated interrelationships between food acquisition, storage, consumption, and disposal of food by-products in prehistoric sites. It is likely that long before native populations established seasonal settlements, planted and harvested crops, and domesticated animals, they had accumulated an extensive knowledge of plant and animal usage. Prehistoric populations exploited floral (as well as faunal) commodities to meet needs beyond subsistence. Plants were obtained to medicate and intoxicate, to make dyes, cordage, mats, baskets, decorative objects, and to construct shelter.

Botanical specimens recovered by flotation from the Cactus Hill Site, 44SX202, were examined in order to advance understanding of resource availability, resource selection, and procurement. This research capitalizes on the unique interplay seeds have with culture and the environment and formulates research questions that integrate floral data into general and specific research goals for the Cactus Hill Site. The primary research goals were threefold: to delineate prehistorically utilized floral specimens; to examine the ecosystem as reflected by the recovered floral specimens; and to understand the dietary strategies as employed by this population.

A small amount of charred botanical material was derived from the Cactus Hill Site. Despite the paucity of recovered charred floral material; the identified data has qualitative interpretive value. The charred specimens recovered from the Cactus Hill Site represented five native plant types for which there is ethnographic documentation of usage by Native American populations. Watershield and Bulrush possess tubers and edible leaves. Sumac provided a leaf for smoking and was used as a dye and for medicinal purposes as well as basket-making. Fern provided edible fronds which were primarily used to line storage and cooking pits. Hickory nuts were used as food, and the shells were utilized for hot smokeless fires. All of these plant types could have provided motivation for seasonal exploitation of this site area during the spring and fall.

METHODOLOGY

Five samples were studied for this analysis. The five soil samples under study were subjected to a flotation procedure prior to examination. The samples were taken from area D of the site in excavation unit N5E4, from levels 2 through 8. Each of the studied samples was derived from a feature defined as a hearth area.

Examination of biological materials was made with a binocular dissecting microscope. Each of the samples was systematically scanned and floral specimens were identified, counted, extracted, and placed in a labeled vial. Each floral specimen was given a count value of one. Nutshell was counted and weighed in grams. Tables and text discuss both charred and uncharred specimens recovered during analysis.

Floral material was identified to the species level where possible. Confirmation of species was aided by the use of an extensive type collection of floral material and reference materials (Cox 1985; Fernald 1970; Gunn 1972; Lawrence and Fitzsimons 1985; Martin 1972; Martin and Barkley 1961; Mohlenbrock 1980,1981; Peterson 1977; Renfrew 1973).

Quantification of Floral Data

Quantifying botanical data by absolute counts of plant types in each sample is problematic because absolute frequencies may reflect preservation or sampling factors. Absolute frequencies must be viewed

with particular caution at this site because so few charred potentially prehistoric seed specimens were recovered.

A ubiquity analysis was performed for the site area under study. A ubiquity analysis disregards the absolute count of a recovered plant type and instead looks at the number of samples in which the plant type appears within a group of samples. Each botanical species is scored present or absent in each sample (Popper 1988:60-64). The species is considered present whether the sample contains 1 specimen or 500 specimens. The Ubiquity Score of a plant type is the number of samples in which the plant type is present expressed as a percentage of the total number of samples in the group. Therefore five samples is the base number on which the scores are based. For example, hickory nutshell fragments were observed in 4 of the 5 samples thus giving giving hickory fragments a Ubiquity Score of 80%.

In a ubiquity analysis, the scores of one genus does not affect the score of another, and therefore the scores of different plant species can be evaluated independently. The scores can suggest the relative importance or abundance of plant types. The Ubiquity Scores of uncharred plant types can suggests their prominence within the "site landscape". The Ubiquity Scores of charred specimens can suggest the importance in prehistoric utilization as well as botanical prominence within the "site landscape".

The assumptions made for a ubiquity analysis are that all samples in a group are independent. If sample sizes are not all the same there is no worry that variation in sample size will inflate the frequency scores of the botanical families in larger samples.

Delineation of Prehistoric Specimens

Delineation of prehistoric specimens from historic specimens or natural seed rain was the first focus of analysis. To be given consideration as a potential prehistoric floral specimen, two important criteria must be met. First and foremost, the botanical history of each plant recovered must be considered. Plants which are not native to America and were introduced by the colonists were obviously plants not available to prehistoric populations.

The second important criteria is that seed specimens must have been modified in a manner that allows preservation of what is really a biodegradable artifact. Understanding seed reproductive strategies has led investigators to consider only charred seed specimens as useful (and legitimate) constituents of a prehistoric archaeological floral assemblage (Minnis 1981:147; Quick 1961:94-99). The logic behind this assumption is that given normal soil conditions seeds will either fulfill their reproductive function or will decay. The dormancy period for most plants is rarely over one hundred years (Harrington 1972). Therefore, the way that a seed enters the archaeological record is by short circuiting that reproductive function, i.e., by charring. Desiccation is another way in which seeds can circumvent decomposition; however, the environment of the northeastern United States is such that desiccation is a very unlikely occurrence.

All factors which influence preservation must be considered because archaeological plant remains are neither a large nor representative sample of the diet. At an open site in a temperate environment very little plant material is ever preserved. In order to evade microbial action, the material must become charred, a process that requires special circumstances. The specimen must first find its way into a fire and ignite. Then it must be withdrawn from the flames quickly before it turns to ash, or it must be buried so deep in the coals that it cannot find enough oxygen for complete combustion (Keene 1981:183; Wetterstrom 1978:111-112). Following charring, the specimen must be protected from the elements and disturbance in order to remain intact for succeeding centuries. Finally, it must endure the excavation process and the flotation procedure. Clearly hard items such as nutshell are favored whereas soft items are not.

Plant parts can be segregated into three types: those with dense inedible parts that might be discarded in or near a fire (nutshell or fruit pits); those with somewhat dense parts like small seeds which are consumed and would only be burned or buried accidentally; and those plants with no dense parts and a high water content (tubers and greens), which would be ingested and unlikely to carbonize under most circumstances (Keene 1981:183).

In no way do the carbonized plant remains represent a true summary of the diet of the site occupants because charring is a fortuitous but nevertheless accidental event. While it is safe to assume that

the uncharred specimens within the samples are not prehistoric in origin, charring alone does not guarantee prehistoric status to a seed specimen. To assume all charred seeds within a sample to be prehistoric in origin is an assumption with a potential source of error. It is not uncommon for modern seeds to become incorporated into prehistoric assemblages. Vertical seed dispersion can occur from plowing, root holes, drying cracks, downwashing, earthworms, and other burrowing animals (Minnis 1981:145; Keepax 1977; Smith 1985). These processes cross-cut cultural depositional processes.

Sources of Prehistoric Seeds

There are several sources of prehistoric seeds recovered from archaeological contexts. The most widely considered source of prehistoric seeds is direct utilization of the seeds. Many botanical artifacts are the direct result of the collection, processing, and use/consumption of plant resources. Accidents in processing, burning of debris, and the burning of stored materials are the most common actions which result in the direct evidence of seed use (Minnis 1981:145). Few plant parts will be deliberately burned in a fire because most plant discard is too wet to burn readily or it may smoke or smell if burned. However, the medicinal utilization of plants whereby the leaves or roots were sprinkled on hot stones or boiled or steeped in water could result in charred seed remains. The lining of cooking pits with large leaves can also result in charred seed remains.

Of course, another possible source of archaeological seeds is the accidental preservation of the prehistoric seed rain unrelated to any use of the seeds or plant. Naturally dispersed seeds can blow into hearths or be burned on trash middens. Plants can also become carbonized when vegetation is burned off by man or natural means. Day (1953) has documented that in historic times many native American groups in eastern North America manipulated local vegetation conditions by using fire. Intentional burning of forest cover and second growth to clear land for agricultural or hunting purposes was done to clear campsites, increase visibility, facilitate movement, eliminate rodents, improve soil fertility, and foster growth of certain plant species.

The amount of plant food used by a prehistoric population may be meagerly represented in the archaeological record (Keene 1981). Because of the vagaries of survival for plants brought to open sites, quantitative summaries should be viewed with this in mind.

Computer Entry of Data

The cataloging procedures for data were such that the first delineation of data was made at the category called "Specimen". This entry delineated the category of botanical remains such as seed, nutshell, or spore. Latin species nomenclature for floral data was entered in the "Name" column. This category shows how refined the identification was as to whether the precise species and family could be ascertained in analysis. The "Common Name" entry is the name of the botanical specimen by which it is generally known. The data entry listed as "#" is the absolute count number of recovered specimens. The "# Charred" category denotes how many specimens of the absolute count are charred. For example, if the number 2 appears in the "#" column and the number 2 appears in the "# Charred" column; that means that of the 2 recovered specimens both were recovered in the charred state. The category labeled "Wgt" is a gram weight.

FLORAL ANALYSIS

A total of 9 plant species were recovered from the samples under study. Table 1 delineates the occurrence of these plant species within the units studied. It is noted that nutshell fragments were almost exclusively recovered from excavation. The small amount of nutshell that was recovered from the flotation samples was incorporated into the larger samples recovered from excavation. Nutshell fragments have been incorporated into the data base, are included in all tables, and are included in all aspects of this analysis. The nutshell data is analytically subsumed under the category of flotation botanical data.

The uncharred assemblage was comprised of sedge, carpetweed, jewelweed, and buttonbush. The charred specimens included fern, sumac, hickory nutshell, and watershield. Bulrush was recovered in both the charred and uncharred state.

TABLE 1 SPECIMEN TOTALS IN FEATURES

Feature	Common Name	Site	Area	Square	Level	Specimen	Name	#	#Charred	Wgt
1	bulrush	44SX202	D	N5E4	2	seed	Scirpus sp.	2	1	
	buttonbush	44SX202	D	N5E4	2	seed	Cephalanthus occidentalis	3		
	carpetweed	44SX202	D	N5E4	2	seed	Mollugo verticillata	6		
	fern	44SX202	D	N5E4	2	spore	PTERIDOPHYTA	17	17	
	hickory	44SX202	D	N5E4	2	nutshell	Carya sp.	70	70	3.2gm
	sedge	44SX202	D	N5E4	2	seed	Carex sp.	4		
	sumac	44SX202	D	N5E4	2	seed	Rhus spp.	1	1	
							Total for 1:	103	89	
9	buttonbush	44SX202	D	N5E4	3	seed	Cephalanthus occidentalis	1		
	carpetweed	44SX202	D	N5E4	3	seed	Mollugo verticillata	5		
	fern	44SX202	D	N5E4	3	spore	PTERIDOPHYTA	22	22	
	hickory	44SX202	D	N5E4	3	nutshell	Carya sp.	974	974	22.3gm
	jewelweed	44SX202	D	N5E4	3	seed	Impatiens biflora	2		
	sedge	44SX202	D	N5E4	3	seed	Carex sp.	4		
	sumac	44SX202	D	N5E4	3	seed	Rhus spp.	1	1	
	watershield	44SX202	D	N5E4	3	seed	Brasenis schreberi	1	1	
							Total for 9:	1,010	998	
19	buttonbush	44SX202	D	N5E4	5	seed	Cephalanthus occidentalis	9		
	carpetweed	44SX202	D	N5E4	5	seed	Mollugo verticillata	1	1	
	fern	44SX202	D	N5E4	5	spore	PTERIDOPHYTA	12	12	
	hickory	44SX202	D	N5E4	5	nutshell	Carya sp.	44	44	1.3gm
	jewelweed	44SX202	D	N5E4	5	seed	Impatiens biflora	1		

TABLE 1 SPECIMEN TOTALS IN FEATURES

Feature	Common Name	Site	Area	Square	Level	Specimen	Name	#	#Charred	Wgt
							Total for 19:	67	57	
22	buttonbush	44SX202	D	N5E4	7	seed	Cephalanthus occidentalis	4		
	hickory	44SX202	D	N5E4	7	nutshell	Carya sp.	42	42	1.3gm
	jewelweed	44SX202	D	N5E4	7	seed	Impatiens biflora	1		
							Total for 22:	47	42	
23	carpetweed	44SX202	D	N5E4	8	seed	Mollugo verticillata	2		
	fern	44SX202	D	N5E4	8	spore	PTERIDOPHYTA	1	1	
	jewelweed	44SX202	D	N5E4	8	seed	Impatiens biflora	2		
							Total for 23:	5	1	
							Total:	1,232	1,187	

Uncharred Non-Native Species

Carpetweed

Carpetweed *(Mollugo verticillata)* is an annual weed with a deep taproot which became naturalized throughout North America from tropical America (Cox 1985; Fernald 1970). It is not an early spring plant; but rather germination usually occurs later in the season when conditions are more like those of its warmer native habitat. Its late start is compensated for by a very rapid rate of growth in summer and fall when it becomes a nuisance in cultivated areas. It is a common weed in a variety of environmental settings. Although the plant can be cooked and eaten as a potherb, there is some debate as to its availability to native populations (Chapman et al. 1974). The combination of being uncharred and its unsubstantiated prehistoric availability eliminates this plant type from potential prehistoric utilization within the context of this research. A total of 53 uncharred Carpetweed seeds were recovered from four of the five features studied. Carpetweed had a Ubiquity Index of 80%.

Uncharred Native species

Sedge

Sedge *(Carex sp.)* is a grass-like or herbaceous perennial plant. Sedge is a large widely dispersed family found in damp sandy soil (Tiner 1987:113-122). Solitary or loose clumps can grow from one to three feet in height. No ethnographic descriptions for use of this plant were located. A total of eight seeds were recovered. Uncharred sedge was identified in Features 1 and 9 and has a Ubiquity Index of 40%.

Jewelweed

Jewelweed (*Impatiens biflora*) is an annual with a dense cluster of fibrous roots. Of the two native species of this genus in the Northeast, *Impatiens biflora* is the most common. Jewelweed is partial to wet woods, roadside ditches, and margins of shady swamp areas. The seeds are eaten by birds, and this contributes to seed dispersal (Cox 1985:295). Both the young stems and the seeds are edible. The seeds have the taste of butternuts. The water from cooking the plant or the fresh juice is said to prevent poison ivy rash if applied immediately after exposure. Ethnographic accounts describe use of the fresh plant to ease the itching caused by poison ivy rash and insect bites (Cox 1985:295). A total of six seeds were recovered and the Ubiquity Index was 80%. Two uncharred seeds were recovered from both Feature 9 and Feature 23. A single uncharred seed was identified in Feature 19 and in Feature 22.

Buttonbush

Buttonbush (*Cephalanthus occidentalis*) is a deciduous shrub which can reach ten feet in height. Leaf stalks are often red and have fruit-nutlet bearing balls from September through December (Tiner 1987:230). Buttonbush is found along the borders of streams and in forested wetlands. A total of 17 seeds were recovered which were identified as Buttonbush. However none were recovered in the charred state. Three seeds were recovered from Feature 1. Nine seeds were recovered from Feature 19. Four specimens were recovered from Feature 22, and a single seed was recovered from Feature 9. The Ubiquity Index for Buttonbush was 80%.

Potentially Utilized Charred Native

Watershield (Tubers, Leaves--Food and Medicine)

Watershield (*Brasenia schreberi*) is a perennial aquatic with a long horizontal rhizome shallowly buried in bottom mud. Watershield is important in some areas as a source of food for ducks. They eat the seeds and probably contribute to the dispersal of the plant. It also provides good shade and shelter for fish. Watershield is found in sluggish streams. The very young leaves can be used in salads or cooked as greens. The small tuberous roots were used for food by Native American groups (Cox 1985:331). The tubers can be eaten like a potato. The tubers can be gathered in quantity by freeing them from the mud with a stick and collecting them as they float to the water's surface. Although somewhat unpleasant tasting when eaten

raw, they are more palatable when cooked. They can also be ground into flour (Peterson 1977:96). The leaves are available in the spring, and the tubers are available in the fall and early spring.

> An early writer discussing medical flora wrote the following about watershield:
>
> > The underside of the leaf is covered with a coat of pale jelly, sometimes purplish,...the leaves afford one of the few instances of pure homogeneous vegetable jelly, being spontaneously produced and covering the whole under surface of the leaves and the stem. Deer are very fond of eating these leaves; even swim in the water in search of them. They are mucilaginous, astringent,...tonic and nutritious. When dry the gelatinous matter almost disappears yet they impart mucilage to water...unnoticed as yet by all medical writers but well known to the Indians (Rafinesque [1828] as quoted in Erichsen-Brown 1979:211).

A single charred watershield seed was recovered from Feature 9. Watershield has a Ubiquity Index of 20%.

Bulrush (Tuber, Starchy Seeds-Food)

Bulrush (*Scirpus sp.*) is a tall plant generally found in dense stands in shallow fresh or brackish water. The young shoots are good eaten raw or cooked as well as the tender cores at the bases of older shoots. The pollen and ground-up seeds can be used as flour, and the tips of the rootstocks are rich in starch and sugar can be roasted several hours and eaten like potatoes. The rootstocks can also be dried and pounded into flour. The shoots are available in the spring, the pollen in the summer, the seeds in the fall, and the rootstock in the fall and early spring (Peterson 1977:230).

Bulrush was recovered in the charred and uncharred state from Feature 1. Two seeds were recovered, and one was charred and one was not. The Ubiquity Index was 20%.

Hickory (Nuts-Food, Shell-Fire Enhancer)

Hickory (*Carya sp.*) was also represented within the site area. Hickory trees grow best in well drained soils and is commonly found along riverbanks and hillsides. Hickory bears more consistently than black walnuts however yearly yields do vary. A good crop may be expected every one to three years (Keene 1981:66). Hickory is an important wildlife food, and competition with animals should be great. Squirrels, for example, tend to remove the unripened green nuts from the trees. However, hickory is not subject to the extensive damage or production of immature seed observed in acorns (Keene 1981:66). Hickory nuts are at their peak generally in October.

Hickory nut shells seem to be the one item remaining from food preparation that is consistently burned. Apparently aboriginal groups in eastern North America discovered that hickory shells make an excellent, hot virtually smokeless fire for cooking (Smith 1985:121). The proportion of hickory shell far outweighs other shell types in prehistoric sites of the East. The occurrence of walnut shell in eastern prehistoric sites is much more sporadic and less consistent.

Ethnographic accounts dating from the contact period are useful in determining how people may have prepared these nuts. According to early travelers, Indians collected hickory nuts mainly for their oil, although they also ate the nut meats (Swanton 1946:364). An early historian described how the oil was extracted:

> > "At the fall of the leaf, they gather a number of hiccory-nuts,which they pound with a round stone, thick and hollowed for the purpose. When they are beat fine enough, they mix them with cold water,in a clay bason, where the shells subside. The other part is an oily, tough, thick white substance, called by the traders hiccory milk, and by the Indians the flesh, or fat of hiccory-nuts, with which they eat their bread" (Adair 1775:408, quoted in Swanton 1946:365).

There is a distinctive material culture associated with hunter-gatherer groups that depended heavily on the consumption of nutmeats, and the limited evidence of nutshell processing in the Middle Atlantic

region may be related to the extraction of oil rather than nutmeat (Blume 1991). It is doubtful that nuts were an important dietary element for Middle Atlantic Archaic populations, but nuts were an important wildlife food, and the regional expansion of oak-hickory forests during certain periods of the Holocene would have permitted an increase in animal populations that in turn allowed expansion of human populations (LeeDecker 1991:273-274).

A total of 1,130 charred nutshell fragments with a total weight of 28.1 grams were recovered from four of the five features under study (Ubiquity Index 80%). The fragments were quite small measuring less than 1 mm to the largest fragment being 4 mm in size. The largest amount of recovered nutshell (82%) was from Feature 9.

Fern (Leaves, Tuberous Rootstock--Food, Medicinal, Lining for Storage and Fire Pits)

A component of the assemblage were macrospores from the fern family. A total of 52 macrospores was recovered from features 1, 9, 19, and 23 (Ubiquity Index 80%). All recovered macrospores were charred. PTERIDOPHYTA are plants without true flowers which reproduce chiefly by spores. Some classes of vascular cryptograms produce male microspores and larger female macrospores. Large spores can reach several millimeters in diameter.

One of the first green edible plants in spring is the newly emerging curled frond of ferns. In early spring, the new fronds could be gathered and eaten raw, cooked, or simmered in soups and stews for their thickening qualities (Kavasch 1979:68). Ferns are high in oil and starch, and the slender stalks could be ground into flour for bread. The rhizome (underground stem) could be baked like potatoes in hot coals. Virginia Indians used hickory ashes as seasonings for this vegetable (Kavasch 1979:72).

Members of the fern family have also been documented as utilized by American Indians for medicinal purposes (Harris 1985:95). The Cherokee placed great medicinal value in several species of ferns as anti-rheumatics because the unrolling of the fronds suggests the straightening out of contracted muscles and limbs. It was thought that rheumatism was caused by worms because the cramped movements of the patient resembled those of the worm. The roots were used as a worm expellant (Harris 1985:31). Ferns were also used by East coast tribes as an absorbent dressing for open sores and wounds (Kavasch 1979:69-70).

Fern comprised a large component of the floral assemblage, and it is important to understand why fern is so dominant in the assemblage. One explanation lies in the fact that the undersides of the leaflets contain thousands of spore cases each containing thousands of macrospores (Cobb 1963:36). Therefore, millions of spores are produced each season and thereby, by virtue of the sheer volume, have an increased likelihood of being incorporated into the archaeological record. While this is certainly a factor not to be ignored, a more important reason why macrospores are so prevalent is that ferns were used to line cooking pits (Stewart 1982). This functional utilization provides an ideal opportunity for macrospores to become charred and incorporated into the archaeological record. Indeed, the features from which the specimens were recovered were identified as oval or circular hearths or cooking pits.

Sumac (Leaves, Root--Smoking Material, Dye, Medicine, and Basket Making; Fruit--Beverage)

Sumac (*Rhus ssp.*) is a small tree or shrub with dense clusters of small fruit. Poison sumac is easily distinguished from other varieties of sumac because the poisonous berries are white and all others are red (Medsger 1966:214). The fruit; when soaked in water; makes a delicious beverage (Peterson 1977:186). The beverage has been dubbed "Indian lemonade" (Medsger 1966:213). There is extensive documentation for the medicinal utilization of numerous species of Sumac by the Navaho, Ojibwa, Delaware, Chippewa, Fox, Pawnee, Ponca, Iroquois, and Potawatomi. The uses ranged from elimination of worms to healing snakebites and sores (King 1984:74; Vogel 1970:376).

Sumac leaves and root were used to make a ceremonial tobacco mixture, and the split stems were used in basket making (Moerman 1986:402-407). According to the Historical Dictionary of 1813 (as quoted in Kavasch 1979:165) sumac berries became so esteemed in Europe for smoking that they were preferred to the best of the cured Virginia tobacco. It was reported by an early writer in 1779 that:

> An Indian carries pouch and pipe with him wherever he goes, for they are indispensable. For state occasions they may have an otter skin pouch or a beaver-pouch...In the pouches they carry tobacco, fire material, knife and pipe. Sumac is generally mixed with tobacco or sumac smoked without tobacco (as quoted in Erichsen-Brown 1979:115).

It is further reported in 1778 that:

> Sumac likewise grows here in great plenty; the leaf of which , gathered...when it turns red, is much esteemed by the native. They mix about an equal quantity of it with their tobacco, which causes it to smoke pleasantly (Carver 1778:30 as quoted in Erichsen-Brown 1979:115).

Byrne and Finlayson (1974) report that staghorn sumac made up 15.6 percent of the wild seeds found at the Crawford Lake Site in Ontario. They were found in 39.3 percent of the features examined--pits, ovens, and middens. They were the only seeds identified to the species level (Erichsen-Brown 1979:115).

A report written by Harriot in 1590 entitled Virginia Indians says about sumac:

> Dyes of divers kindes. There is Shoemake well knowen, and used in England for blacke...The inhabitants use them only for the dyeing of hayre; and colouring of their faces, and Mantles made of Deare skinnes; and also for the dying of Rushes to make artifical workes withal in their Mattes and Baskettes (as quoted in Erichsen-Brown 1979:115).

A single sumac seed was recovered from Feature 1 and Feature 9. The Ubiquity Index was 40%.

Exploitation Strategies

Table 2 indicates the seasonal availability of the nuts, tubers, greens, and starchy seeds. Some of the plant types fall into more than one category. For example, bulrush is comprised of tubers and greens as well as starchy seeds. Bulrush is therefore repeated in each appropriate category. The data is categorized in this fashion because more than one element of the plant may have been used and more importantly the various elements may be available at different times of the year.

Tubers and rootstocks were most likely abundant in the study area. Historically, tubers were important plant foods to the indigenous populations in the Eastern Woodlands (Kavasch 1979; Hamel and Chiltoskey 1975). Tuberous plants abound in damp habitats such as swamps, steam edges, riverbanks, and moist woods.

Collection costs for tubers are variable. Some species tend to aggregate, whereas others are more dispersed. Some species require extensive excavation, while others are easily gathered (Keene 1981:85). Similarly, the amount of processing required varies by species. Generally, tubers are either boiled or roasted. In most cases, processing for storage would have been incidental to preparation for consumption (Keene 1981:85).

Tuberous plants were available in early spring and late autumn. Most aquatic tuberous plants produce more than 1 tuber per plant. Keene estimates an average yield of 5 mature tubers per plant (1981:85).

Along the streams and creeks, edible greens would have been abundant. Many of the tubers also possess edible greens as a plant part constituent. Edible greens tend to exhibit a scattered but dense distribution. Keene (1981) reports that densities for greens is high in terms of stems per acre and these resources would have been sufficiently abundant. Search time would not have been a major component in cost of acquisition. In addition to this, the cost of processing would be minimal, consisting of leaf stripping and cooking. Greens would have provided a good food source for minimum investment of time and energy.

Starchy seeds have a very high cost in terms of expended labor. Seeds have a very high utility but have a relatively high processing cost. More intensive labor is needed for collecting and processing starchy seeds than any other wild plant food.

While seed-bearing weeds entail a relatively high processing cost they would also be a relatively predictable and prolific resource with low search and pursuit costs (Keene 1981:90). Weedy genera require no thinning, watering, fertilizing, planting, or hoeing in order to achieve significant stands; therefore, the maintenance expenditure is quite low (Hatch 1980). One of the most important aspects of the opportunistic plants is that the seeds are most efficiently harvested after the first killing frost when other plant foods would have been scarce.

Humans would have been in direct competition with wildlife for fruit and nuts. Reidhead (1980) notes that production of fruit-bearing shrubs would not have had to be very high to allow economic utilization. Because most tend to dense stands or thickets and are relatively consistent over the short run, productive localities could be exploited repeatedly without a major search cost (Keene 1981:80-81).

The processing of nuts involves collecting, hulling, shelling, and preparation. Keene (1981) developed a rank order for nuts depending on the time and energy expended to perform these processing functions. Keene determined that black walnuts would be the least expensive to collect because of their large size and high yield per tree. However, black walnuts have thick hulls and would be more time consuming to shell. Acorns would have a higher initial collection cost than black walnut because of their smaller yield per plant and smaller size but a lower marginal cost and could be efficiently collected in large quantities (Keene 1981:71). Keene (1981) ranked hickory as the most efficient nut to collect, hull, shell, and process.

Plant material was also exploited for medicinal purposes. Prehistoric populations understood and utilized the natural resources of their environment. An early report on Indian medicine relates:

> Although the Indians, being without the advantages of science to guide them in their choice of remedies, and treatment of diseases, derive their principles from mere experience, it is certain we are indebted to their materia medica for many valuable articles of a vegetable kind...(Winder 1846:11 as quoted in Erichsen-Brown 1979:278).

Medicinal barks were so generally available that they were usually gathered when they were needed (Densmore 1974:327). Bark is not listed in Table 2 because it is assumed that it was available all year long.

The part of the plant most frequently used medicinally was the root. Most roots could be gathered all year, but it is easier to gather roots when the plant is in bloom because they can then be identified more readily. Unless references specifically noted that roots of a particular plant were gathered all year, then they are listed in Table 2 for the period of growth when they would have been the most recognizable.

Many ethnographic accounts refer to root preparation and storage. Roots intended for later use could be pulverized and stored in that form. Certain roots, when used, were broken into short pieces and boiled or steeped, but a majority were prepared for use either by pounding until they were in shreds or by pulverizing them in the hands. The most common method of pulverizing roots was to place them in the palm of the left hand and then to rub them either with the thick portion of the right hand below the thumb or with the fingers of the right hand (Densmore 1974:326) If several roots were to be used in combination, they were usually pounded together in order to blend them. Poultices were made by moistening the pounded fresh or dry roots or herbs (Densmore 1974:329).

If stalks, leaves, or flowers were to be used as remedies, they were dried by hanging them with the top downward and kept as clean as possible. After drying, they could be stored. Stalks, leaves, and flowers were usually pulverized in a similar manner to the preparation of roots. Vegetable substances were further prepared for use by combining them with water. Some were boiled a few moments; others were allowed to come to a boil, then removed from the fire, and others were scaled or steeped.

TABLE 2 SEASONAL AVAILABILITY OF PLANT FOODS

PLANT PART	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	HABITAT
Starchy Seeds													
Bulrush								X	X				shallow water
Tubers													
Fern				X	X	X							moist woods
Bulrush			X	X					X	X			shallow water
Watershield			X	X	X				X	X	X		quiet water
Roots													
Sumac	X	X	X	X	X	X	X	X	X	X	X	X	various habitats
Fern				X	X	X							moist woods
Shoots/Leaves													
Sumac			X	X	X	X	X	X	X	X	X	X	various habitats
Ferns				X	X	X							moist woods
Bulrush			X	X									shallow water
Watershield			X	X	X								quiet water
Fruits													
Sumac						X	X	X	X	X			various habitats
Hickory										X			river banks.

Native Americans smoked many plants long before they smoked tobacco, and they continued to smoke these plants after they could obtain tobacco. They smoked to please the spirits upon whose goodwill their existence depended. Smoking, drinking, and chewing decoctions of plant materials produced narcotic effects. The native Americans also smoked plants for their medicinal properties, and some plants were smudged on the fire to drive away insects or to serve as purifiers (Erichsen-Brown 1979:vi).

SUMMARY

Eastern prehistoric settlement patterns are generally characterized by seasonal movements through a series of habitats that provide various plant and animal foods at different time of the year. The recovered botanical data from Cactus Hill Site suggests that early populations exploited the area most intensively during the spring and fall.

Tubers were important plant foods to the indigenous populations in the Eastern Woodlands, and they were usually boiled or roasted prior to consumption (Kavasch 1979; Keene 1981; Hamel and Chiltosskey 1975). Tuberous plants were available in the early spring and late autumn, and some species were available throughout the year.

Edible greens also would have been abundant in streamside and wetland areas, and many of the tubers also possess edible greens as a constituent plant part. Shoots and leaves from ferns, bulrush, and watershield would have been most abundant during the spring. Sumac has an availability lasting well into the early winter months. Edible greens tend to exhibit a scattered but dense distribution, but they would not have required a large amount of search time. The processing requirements for greens are minimal, consisting only of leaf stripping and cooking (Keene 1981).

Relative to other plant foods, starchy seeds have a high cost in terms of the labor required for processing. But while they require more effort for processing, seed-bearing plants were a predictable and prolific resource that required minimal effort for acquisition. One important aspect of the starchy seeds is that they were most efficiently harvested after the first killing frost, when other plant foods would have been scarce (Hatch 1980; Keene 1981).

Charred hickory nut often accounts for the majority of the botanical assemblage from hunter-gatherer sites in the eastern United States, but the preservation of nutshell in archaeological contexts may reflect taphonomic factors rather than its importance in the diet. Relative to other plant parts, nutshell is hard and dense, and these physical characteristics may have facilitated its preservation.

The recovered botanical data represent potentially utilized plant resources. The recovery of potentially edible and medicinally valued plants does not necessarily mean that all were culturally perceived or regularly utilized as important food, medicine, or smoking material. However, all of the charred native specimens are potentially exploited tubers, greens, rootstock or starch seeds.

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APPENDIX E

VERTEBRATE ARCHAEOFAUNAL REMAINS FROM THE CACTUS HILL SITE (44SX202), SUSSEX COUNTY, VIRGINIA

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INTRODUCTION

Vertebrate faunal remains analyzed from the Cactus Hill Site (44SX202) include 1,098 specimens, mostly small (less than one centimeter), fragmentary, and calcined (incinerated). The specimens submitted for analysis came from two excavation areas (B and D) of the site. Faunal remains were recovered from six excavation squares and from six excavation levels in area B and from 8 excavation squares and 9 excavation levels in area D. In addition, calcined bone was recovered from hearths and other feature contexts.

These remains were identified to the smallest possible taxonomic division using the author's comparative vertebrate osteological collection which is fairly comprehensive for Middle Atlantic region Holocene epoch fauna. Given the ages of the components of the Cactus Hill Site and the paucity of archaeofaunal remains in Virginia predating the Woodland period, an unusually intensive effort was made in these identifications. Only one specimen appeared to be unidentifiable due to comparative collection deficiencies and was sent to Paul W. Parmalee of the University of Tennessee, Knoxville. Most specimens, however, were only identifiable as "vertebrate" or "mammalian" due to extreme fragmentation (only three whole bones were included) and weathering. Furthermore, since all but three of the specimens are calcined, warping and shrinkage had to be factored into the identification process.

In addition to taxonomic assignment, an attempt was made to identify the skeletal element, element side and portion, and the age of the individual represented by each fragment. Observations of burning and other postmortem alterations were also made and recorded. No evidence of artificial modification (e.g., cut marks) other than calcination was observed among the pieces. In addition, no specimens exhibited conclusive evidence of animal mastication or digestion.

IDENTIFICATIONS

Remains of individuals representing all classes of vertebrates were identified in the sample. Only 23 specimens were identified to the species taxonomic level (Table 1), and more than half of these were identified as white-tailed deer (*Odocoileus virginianus*).

Class Pisces (Fishes)

Order Perciformes

Only one very small, calcined, and fragmentary scapula recognizable as belonging to a perciform fish was identified from unit N2E1, level 4, with an Early Archaic, Palmer association. The fragment includes the pectoral articular surface and compares best with examples from the family Centrarchidae (sunfishes). The individual was probably comparable in size to an adult sunfish such as a pumpkinseed (*Lepomis gibbosus*).

Class Amphibia (Amphibians)

Rana catesbeiana **(Bullfrog)**

One calcined fragment including the acetabular portion of the left ilium of a bullfrog was identified from unit N2E1, level 4, with an Early Archaic, Palmer association. This identification is based primarily upon size. Even having possibly shrunk from calcination, the ilium is larger than would be expected for other ranid frogs.

Class Reptilia (Reptiles)

Lampropeltis **sp. (King/Milk Snake)**

One calcined vertebra of a king/milk snake recovered from unit N5E4, level 7, feature 22, was identified on the basis of its high narrow haemal keel and deeply notched zygosphene. This represents an Early Archaic, Decatur association.

Kinosternon subrubrum **(Mud Turtle)**

Two specimens, a hypoplastron from unit N1E1, level 7 and a peripheral from unit N2E1, level 4, were readily identified as mud turtle shell. Each is calcined and appear to represent an adult individual. These fragments were recovered from Early Archaic contexts.

Sternotherus odoratus **(Stinkpot)**

One calcined right hypoplastron fragment of a small stinkpot was recovered from the level 4 floor of unit N5E4 and was thus associated with Late Stanley, Middle Archaic period materials.

Family Kinosternidae (Mud/Musk Turtle)

Six specimens including two carapace peripherals (unit N1E0, level 2 and unit N2E1, level 9), two miscellaneous carapace fragments (unit N5E4, level 5) and parts of two plastrons (unit N1E1, level 7 and unit N5E4, level 7, feature 22) assignable to the family Kinosternidae were identified. All six are calcined. The specimens were recovered from Early and Middle Archaic contexts.

Chrysemys **cf.** *picta* **(Painted Turtle?)**

The proximal shaft of a left humerus resembling that of the painted turtle, *Chrysemys picta*, was identified from level 1 of unit N2E1. Other locally common members of the genus (e.g., *C. concina*), however, exhibit very similar appendicular skeletal morphology, precluding more than a tentative identification for this fragmentary calcined specimen.

Terrapene carolina **(Eastern Box Turtle)**

One calcined carapace peripheral, recovered from unit N1E0, level 9 (undated context), was identified as belonging to an eastern box turtle (*Terrapene carolina*).

Family Kinosternidae/Emydidae (Mud/Box/Pond Turtle)

Thirty calcined and fragmentary specimens, recovered from various units and levels of excavation, were identifiable only as belonging to either the family Kinosternidae (mud turtles) or Emydidae (box/pond turtles). One specimen is a carapace peripheral fragment, one is a carapace pleural fragment, two are plastron fragments, and the others are indeterminate shell fragments.

Class Aves (Birds)

Meleagris gallopavo **(Wild Turkey)**

Two calcined specimens were identifiable as fragments of bones of the wild turkey (*Meleagris gallopavo*). These include one portion of a right coracoid including the scapular and glenoid facets recovered from a Middle Archaic hearth in unit N0E0, level 2 and one shaft portion of a right ulna recovered from an Early Archaic context, unit N1E0, level 6.

Indeterminate Large Bird

Three calcined specimens, including one long bone diaphysis fragment from a hearth in unit N2E1, level 4, and one from unit N5E4, level 8, and one distal fragment of a right tibiotarsus, including the interior condyle, from unit N0E0, level 1, are identifiable only as "large bird".

Indeterminate Bird

One calcined diaphysial fragment of a long bone, identifiable only as "indeterminate bird", was recovered from a hearth in unit N2E1, level 5.

Class Mammalia (Mammals)

Order Carnivora (Carnivores)

One calcined rotular groove portion of the right femur of a bobcat-sized carnivore was recovered from unit N1E1, level 5 (Early Archaic). The piece is too fragmentary for a more definite identification.

Sciurus **sp. (Gray/Fox Squirrel)**

One calcined fragment of the right astragalus of a squirrel was recovered from unit N2E1, level 8 (undated context). Because of shrinkage due to calcination, it cannot be determined as to which species of *Sciurus* it belongs.

Ondatra zibethicus **(Muskrat)**

A portion of the shaft of a left tibia was recovered from an Early Archaic, Fort Nottaway context in unit N2E3, level 6. Its size, accounting for shrinkage from calcination, and its distinctive dorso-medial crest conclusively identify it as belonging to a muskrat (*Ondatra zibethicus*).

Odocoileus virginianus **(White-tailed Deer)**

Fourteen specimens belonging to white-tailed deer were recovered from Early through Late Archaic period contexts. The specimens include six fragments of phalanges, four distal fragments of metapodials (including one metacarpus), one whole sesamoid, and one portion of a left humerus including the lateral supracondyloid ridge. All specimens are calcined and appear to be from adult individuals.

Family Cervidae (Deer/Elk/Caribou)

Eight calcined pieces of antler (six from an Early Archaic hearth in unit N2E1, level 5 and two from an Early Archaic context in unit N1E1, level 3) were identifiable only as belonging to the family Cervidae. Given the relative abundance of white-tailed deer (*Odocoileus virginianus*) remains identified in other Early Archaic contexts of the site, they probably represent deer antler rather than elk.

Family Suidae (Pig)

One piece of the enamel of a molar which, based upon its cusping pattern, can only have come from a pig, was found in level 1 of unit 1/9, area B. This unburned fragment may belong to domestic pig (*Sus scrofa*) which would identify it as an historic period introduction to this mixed deposit which also contained Late Archaic period materials.

Homo sapiens **(Human)**

One small (dime-sized), calcined fragment of human cranium was recovered from area B, unit 1/9+2/9, level 2. This fragment may be all that remains of a human cremation and probably dates to the Middle or Late Archaic period.

Indeterminate Large Mammal

Seven calcined fragments (three long bone diaphyseal, one rib, one scapular, and one vertebral) were identifiable only as having come from a large (deer-sized) mammal. Given the relative abundance of white-tailed deer remains and the lack of identifiable remains of other large mammals in the assemblage, these specimens probably belong to white-tailed deer. One fragment, the glenoid surface of the scapula of probably a large ungulate, was recovered from a Paleoindian context (area B, unit 0/9, level 5).

Indeterminate Mammal

One hundred and sixty-eight fragments were identifiable only as having come from mammals based upon their overall structure. Four are long bone diaphyseal fragments, and the remainder are only recognizable as bone fragments.

Indeterminate Vertebrate

Most (846) of the specimens submitted for analysis are only identifiable as bone and are, therefore, from unknown vertebrates. Most of these specimens (836) are less than 1 cm in maximum dimension, and none is larger than 1.5 cm in maximum dimension.

CONCLUSIONS

Although the archaeofaunal sample from Cactus Hill is small and the specimens are nearly all calcined and fragmentary, they do constitute the largest sample yet recovered from stratified Archaic period contexts in the eastern part of Virginia. Consequently, there is nothing in the region with which to compare the sample or from which to draw expectations concerning its composition. Various authors (Barber 1991; Stevens 1991; Whyte 1990), lacking tangible evidence have attempted by means of extraregional analogs and reference to later prehistoric and historic period faunal assemblages to construct models of Archaic period human subsistence and ecology in the Middle Atlantic region. In certain cases, negative evidence has been invoked in support of such models. Stevens (1990:204), for example, offers the following:

> The absence of Middle Archaic shell middens indicates shellfish gathering did not contribute significantly to the Middle Archaic diet. Similarly, the absence of any direct or indirect evidence to support the exploitation of anadromous fish suggests that this resource played little, if any role in Middle Archaic adaptive strategies.

Such desperate attempts to make at best a guess at the nature of the human past only emphasize the problem at hand and the evident need for additional discovery and investigations of sites such as Cactus Hill where some of the actual remains of peoples' foods have been preserved and carefully recovered. Stevens' remarks are also testimony to the common failure of researchers to consider the complexities of taphonomic processes in the transformation of archaeofaunal assemblages.

Nearly every specimen recovered from and therefore preserved on the Cactus Hill site has been burned to the degree that it is "calcined." Experiments by Shipman et al. (1984) in the burning of bones and teeth indicate that bones become white with tints of blue (calcined) when heated to

temperatures of >645°C. In other words, the bones recovered from the Cactus Hill Site were either (1) deposited in open fires as a means of refuse disposal, (2) inadvertently burned by fires constructed on or occurring directly over them, or (3) burned as a result of deliberate cremation of animals. Bones do not become calcined in the process of successful cookery. Even the shells of turtles roasted in flames or coals would not have become calcined both inside and out as a result of the cooking of their contents for human consumption. Based on the author's own experiments with snake cooking and bone burning (Whyte 1991), the first scenario mentioned above explains most of the burning evidenced by the Cactus Hill vertebrate remains.

It is acceptable to assume then that only bones which were incinerated in refuse disposal and perhaps occasionally by other means have survived the tests of time in the matrix of the Cactus Hill site. It is possible that only certain bones of selected species eaten by visitors to the site were treated in this manner (see Whyte 1991). Given this possibility, one must question the representativeness of the recovered archaeofaunal sample. The sample recovered is a sample of what was preserved; the latter is a sample of what was burned; the latter was a sample of what was deposited at the site; and the latter was a sample of what was actually consumed by the residents of the site (see Klein and Cruz-Uribe 1984:3-4). It is not surprising, therefore, that the archaeofaunal data from the site do not provide a tidy fit with Newman's results of immunological analyses of residues on stone tools from Cactus Hill. For example, it is well known that hunter-gatherers may process the carcasses of large mammals such as elk or muskox at the kill site, thus imparting residues of tissue and blood to the surfaces of their tools, yet return to the residence with only the meat and hide (Perkins and Daly's [1968] "schlepp effect").

Given these considerations, the Cactus Hill archaeofaunal sample can be interpreted only with extreme caution. Any attempt to explore the specifics of human dietary composition by means of quantifications of taxonomic abundance and diversity and allometric conversions would be unfounded. Although the Cactus Hill Site excavations have provided a rare opportunity to view Virginia's most ancient human past, we are unfortunately restricted by taphonomic factors to the construction of a partial "grocery list" and to some tentative estimations of the region's paleoenvironment.

There were no "surprises" in the identifications in that the species represented among the identifiable specimens are common within the region today. Consequently, no evidence of environmental change within the region of the site since the Early Archaic period is provided by the modest archaeofaunal data. Assuming that the individuals of aquatic species (fish, frog, turtles, muskrat) represented were obtained by foraging near the site, the immediate environs would have included still or slow water such as marshes or sloughs just as they do today. The site is nearly surrounded by swamp and is bordered on the west by the Nottoway River.

As a whole, the assemblage indicates the acquisition of a variety of terrestrial, avian, and aquatic fauna by visitors to the site. Possible seasonal indicators include the identifications of bullfrog, snake, and turtles which would have been more obtainable in warmer seasons. The recovery of cervid antler fragments does not indicate a fall or winter use of the site in that antlers are shed and were often carried along as tool supply. Given the extreme temporal range of site occupations, one would expect that each season would be represented by the overall assemblage.

Most of the specimens were recovered from Early and Middle Archaic levels of the site. It follows that most of the taxa identified are also represented in these levels (Table 3). Aquatic taxa (fishes, amphibians, turtles, and Muskrat) are nearly restricted to Early Archaic contexts based upon the sample recovered (Table 3). The question of whether this represents temporal variation in site function, seasonality, or human diet or is a

product of depositional/preservational bias can only be clarified through investigation of similar sites within the region.

The poor correlation between the archaeofaunal and immunological data for the Early Archaic manifestations at Cactus Hill may be disappointing but is not too difficult to explain. Newman obtained positive reactions to deer, rat, rabbit, dog, and cat on Palmer period artifacts, Guinea pig, deer, and elk on Decatur and Fort Nottaway period artifacts, and deer and elk on Kirk Side-notched period artifacts. Among the vertebrate remains preserved from Early Archaic contexts, deer, muskrat, and unidentified carnivore were identified to match particular immunological reactions.

No remains of rabbit or elk were identified. It is almost certain that rabbits would have been eaten by the various site occupants, but it should not be expected that their bones would have remained preserved among the few identifiable fragments recovered from the site. The absence of remains of elk, however, requires another explanation if we are to assume that the immunological identifications of elk protein are accurate. As mentioned above, larger animals killed at a distance from the residence may have been filleted to facilitate transport of the meat, leaving the heavy bones at the kill site. Thus, the only preservable evidence of elk returning to the site may have been blood residues on stone tools.

SUMMARY

The archaeofaunal remains recovered from the Cactus Hill Site, although few, fragmentary, and calcined, constitute the best preserved and dated Early Holocene assemblage yet recovered from the Middle Atlantic region. Consequently, an extreme effort was made to correctly identify the specimens. Fragments of a bone (probably a scapula) recovered from a deposit including Paleoindian stone tools were only identifiable as having come from the skeleton of a large mammal. Specimens recovered from Palmer, Kirk, Decatur, and Fort Nottaway (Early Archaic) deposits include bones identified as fish, bullfrog, king/milk snake, mud/musk turtle, turkey, muskrat, and white-tailed deer. Middle Archaic (Stanly, Morrow Mountain, Halifax, Guilford) deposits included remains of mud/musk turtles, painted turtle, turkey, and white-tailed deer. Late Archaic (Savannah River) deposits yielded remains of mud/musk turtle and white-tailed deer. In addition, one calcined human cranial bone fragment was recovered from a deposit dating to the Middle or Late Archaic period.

These remains provide no measurable faunal record of environmental change for the Archaic period of Virginia's Inner Coastal Plain. The species represented are common in the area of the site today. The assemblage is furthermore indicative of generalized foraging by the occasional hunter-gatherers who visited the site on probably a seasonal basis throughout the early- to mid-Holocene. The white-tailed deer, however, may have played a more focal role in the annual diet.

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Table 1. Vertebrate Archaeofaunal Remains from the Cactus Hill Site (44SX202), Sussex County, Virginia.

Taxon	Element	Condition	Size	NISP
(Area B, Sq. 0/0, Level 2)				
Vertebrata	bone	calcined	0-1cm	1
(Area B, Sq. 1/9, Level 1)				
Suidae (pig)	molar	unburned	0-1cm	1
Mammalia	bone	calcined	1-2cm	1
Vertebrata	bone	calcined	0-1cm	4
(Area B, Sq. 1/9 & 2/9, Level 2)				
Odocoileus virginianus	metapodial	calcined	0-1cm	1
	l. phalanx 2	calcined	0-1cm	1
Homo sapiens	cranial	calcined	1-2cm	1
Mammalia	bone	calcined	0-1cm	2
			1-2cm	1
Vertebrata	bone	calcined	0-1cm	2
(Area B, Sq. 1/9 & 2/9, Level 3)				
Vertebrata	bone	calcined	0-1cm	1
(Area B, Sq. 1/9 & 2/9, Level 4)				
Vertebrata	bone	calcined	1-2cm	1
(Area B, Sq. 1/11, Level 1)				
Odocoileus virginianus	phalanx 1	calcined	1-2cm	1
Mammalia	long bone shaft	calcined	1-2cm	2
(Area B, Sq. 2/11, Level 6)				
Vertebrata	bone	unburned	0-1cm	1
(Area B, Sq. 4/11, Level 5)				
large Mammalia	long bone shaft	calcined	2-3cm	1

(Area B, Sq. 0/1, Level 6)

Vertebrata	bone	calcined	1-2cm	1

(Area D, Sq. N0E0, Level 1)

Kinosternidae/Emydidae	shell	calcined	0-1cm	1
large Aves	r. tibiotarsus	calcined	0-1cm	1
Mammalia	bone	calcined	0-1cm	10

(Area D, Sq. N0E0, Level 2: Halifax Hearth)

Meleagris gallopavo	r. coracoid	calcined	1-2cm	1

(Area D, Sq. N0E0, Level 5)

Vertebrata	bone	calcined	0-1cm	2

(Area D, Sq. N1E0, Level 2)

Kinosternidae	marginal	calcined	0-1cm	1
Odocoileus virginianus	metapodial	calcined	0-1cm	1
	phalanx 1	calcined	1-2cm	1
Mammalia	bone	calcined	0-1cm	1
Vertebrata	bone	calcined	0-1cm	3
			1-2cm	1

(Area D, Sq. N1E0, Level 3)

Odocoileus virginianus	sesamoid	calcined	0-1cm	1
Mammalia	bone	calcined	0-1cm	1
			1-2cm	1
Vertebrata	bone	calcined	0-1cm	3
			1-2cm	1

(Area D, Sq. N1E0, Level 4)

Mammalia	bone	calcined	0-1cm	1

(Area D, Sq. N1E0, Level 5)

Mammalia	bone	calcined	1-2cm	1
Vertebrata	bone	calcined	0-1cm	1

(Area D, Sq. N1E0, Level 6)

Meleagris gallopavo	r. ulna	calcined	1-2cm	1

(Area D, Sq. N1E0, Level 7)

Kinosternidae/Emydidae	marginal	calcined	0-1cm	1
Odocoileus virginianus	phalanx 3	calcined	0-1cm	1

(Area D, Sq. N1E0, Level 8)

Vertebrata	bone	calcined	0-1cm	5

(Area D, Sq. N1E0, Level 9)

Terrapene carolina	l. marginal	calcined	0-1cm	1
Mammalia	bone	calcined	0-1cm	1

(Area D, Sq. N1E1, Level 1)

Odocoileus virginianus	metapodial	calcined	1-2cm	1
Vertebrata	bone	calcined	0-1cm	1

(Area D, Sq. N1E1, Level 2)

Mammalia	bone	unburned	0-1cm	1
		calcined	0-1cm	2

(Area D, Sq. N1E1, Level 3)

Cervidae	antler	calcined	0-1cm	1
			1-2cm	1
Mammalia	bone	calcined	0-1cm	1

(Area D, Sq. N1E1, Level 4)

Mammalia	bone	calcined	0-1cm	1
Vertebrata	bone	calcined	0-1cm	1

(Area D, Sq. N1E1, Level 5)

Carnivora	r. femur	calcined	0-1cm	1
Mammalia	bone	calcined	1-2cm	1

(Area D, Sq. N1E1, Level 7)

Kinosternon subrubrum	l. hypoplastron	calcined	1-2cm	1
Kinosternidae	plastron	calcined	0-1cm	1

(Area D, Sq. N1E2, Level 1)

Mammalia	bone	calcined	0-1cm	1
			1-2cm	1

(Area D, Sq. N1E2, Level 1)

large Mammalia	long bone shaft	calcined	1-2cm	1

(Area D, Sq. N2E0, Level 1)

Mammalia	bone	calcined	0-1cm	2
Vertebrata	bone	calcined	0-1cm	4
			1-2cm	1

(Area D, Sq. N2E0, Level 2)

Mammalia	bone	calcined	1-2cm	2
Vertebrata	bone	calcined	0-1cm	4

(Area D, Sq. N2E0, Level 3)

Mammalia	bone	calcined	0-1cm	1

(Area D, Sq. N2E0, Level 4)

Mammalia	bone	calcined	0-1cm	1

(Area D, Sq. N2E0, Level 5)

Mammalia	bone	calcined	0-1cm	2
Vertebrata	bone	calcined	0-1cm	2
			1-2cm	1

(Area D, Sq. N2E0, Level 6)

Vertebrata	bone	calcined	0-1cm	2

(Area D, Sq. N2E0, Level 7)

Vertebrata	bone	calcined	0-1cm	6

(Area D, Sq. N2E1, Level 2)

Mammalia	bone	calcined	0-1cm	2
Vertebrata	bone	calcined	0-1cm	2

(Area D, Sq. N2E1, Level 5)

Mammalia	bone	calcined	0-1cm	3

(Area D, Sq. N2E1, Level 5: Palmer Hearth)

Aves	long bone shaft	calcined	1-2cm	1
Cervidae	antler	calcined	0-1cm	1
			1-2cm	2
			2-3cm	1
			3-4cm	2
Mammalia	bone	calcined	0-1cm	1

(Area D, Sq. N2E1, Level 8)

Odocoileus virginianus	l. humerus	calcined	1-2cm	1

(Area D, Sq. N2E1, Level 1: Lowest Region fine scr.)

cf *Chrysemys picta*	l. humerus	calcined	0-1cm	1
Odocoileus virginianus	metacarpus	calcined	1-2cm	1
	metapodial	calcined	0-1cm	2
Mammalia	bone	calcined	0-1cm	6
			1-2cm	4
Vertebrata	bone	calcined	0-1cm	89
			1-2cm	2

(Area D, Sq. N2E1, Level 2 fine scr.)

Odocoileus virginianus	phalanx	calcined	0-1cm	1
Vertebrata	bone	calcined	0-1cm	4

(Area D, Sq. N2E1, Level 3 fine scr.)

Kinosternidae/Emydidae	shell	calcined	0-1cm	1
Mammalia	bone	calcined	0-1cm	8
			1-2cm	1
Vertebrata	bone	calcined	0-1cm	33

(Area D, Sq. N2E1, Level 4 fine scr.)

Perciformes	scapula	calcined	0-1cm	1
Rana catesbeiana	l. ilium	calcined	0-1cm	1
Kinosternon subrubrum	marginal	calcined	0-1cm	1
Mammalia	bone	calcined	0-1cm	2
			1-2cm	1
Vertebrata	bone	calcined	0-1cm	18

(Area D, Sq. N2E1, Level 4: Palmer Hearth? fine scr.)

Kinosternidae/Emydidae	shell	calcined	0-1cm	1
large Aves	long bone shaft	calcined	0-1cm	1
Vertebrata	bone	calcined	0-1cm	10

(Area D, Sq. N2E1, Level 5: Palmer fine scr.)

Kinosternidae/Emydidae	shell	calcined	0-1cm	1
Mammalia	bone	calcined	1-2cm	2
Vertebrata	bone	calcined	0-1cm	25

(Area D, Sq. N2E1, Level 6: Palmer+ fine scr.)

Kinosternidae/Emydidae	shell	calcined	0-1cm	3
			1-2cm	1
Mammalia	bone	calcined	0-1cm	2
			1-2cm	1
Vertebrata	bone	calcined	0-1cm	116

(Area D, Sq. N2E1, Level 7 fine scr.)

Vertebrata	bone	calcined	0-1cm	63

(Area D, Sq. N2E1, Level 8 fine scr.)

Kinosternidae/Emydidae	shell	calcined	0-1cm	1
Sciurus *sp.*	r. astragalus	calcined	0-1cm	1
Vertebrata	bone	calcined	0-1cm	38

(Area D, Sq. N2E1, Level 9 fine scr.)

Kinosternidae	marginal	calcined	0-1cm	1
Kinosternidae/Emydidae	shell	calcined	0-1cm	2
Mammalia	bone	calcined	0-1cm	2
Vertebrata	bone	calcined	0-1cm	21

(Area D, Sq. N2E3, Level 6)

Kinosternidae/Emydidae	shell	calcined	0-1cm	1
Ondatra zibethicus	l. tibia	calcined	0-1cm	1
large Mammalia	vertebra	calcined	0-1cm	1

(Area D, Sq. N2E3, Fire Pit)

large Mammalia	long bone shaft	calcined	1-2cm	1

(Area D, Sq. N5E4, Level 3, Fea. 9)

Mammalia	bone	calcined	0-1cm	1
Vertebrata	bone	calcined	0-1cm	14

(Area D, Sq. N5E4, Level 4)

Mammalia	bone	calcined	0-1cm	5
Vertebrata	bone	calcined	0-1cm	2

(Area D, Sq. N5E4, Level 4 floor)

Sternotherus odoratus	hypoplastron	calcined	1-2cm	1
Kinosternidae/Emydidae	shell	calcined	0-1cm	1

(Area D, Sq. N5E4, Level 4, Fea. 15)

Vertebrata	bone	calcined	0-1cm	1

(Area D, Sq. N5E4, Level 5, East)

Kinosternidae/Emydidae	pleural	calcined	1-2cm	1
Mammalia	bone	calcined	0-1cm	6
Vertebrata	bone	calcined	0-1cm	7

(Area D, Sq. N5E4, Level 5, West)

Mammalia	bone	calcined	0-1cm	1

(Area D, Sq. N5E4, Level 5, Fea. 19)

large Mammalia	rib	calcined	1-2cm	1
Mammalia	bone	calcined	0-1cm	2
Vertebrata	bone	calcined	0-1cm	7

(Area D, Sq. N5E4, Level 6, East)

Kinosternidae/Emydidae	plastron	calcined	0-1cm	2
Kinosternidae/Emydidae	shell	calcined	0-1cm	7
Mammalia	bone	calcined	0-1cm	7
Vertebrata	bone	calcined	0-1cm	18

(Area D, Sq. N5E4, Level 6, West)

Kinosternidae/Emydidae	shell	calcined	0-1cm	1
Vertebrate	bone	calcined	0-1cm	16

(Area D, Sq. N5E4, Level 7, East)

Kinosternidae/Emydidae	carapace	calcined	1-2cm	1
Kinosternidae/Emydidae	shell	calcined	0-1cm	1
Mammalia	long bone	calcined	1-2cm	2
Mammalia	bone	calcined	0-1cm	1
Vertebrata	bone	calcined	0-1cm	6

(Area D, Sq. N5E4, Level 7, West)

Vertebrata	bone	calcined	0-1cm	2

(Area D, Sq. N5E4, Level 7, Fea. 22)

Lampropeltis sp.	vertebra	calcined	1-2cm	1
Kinosternidae	plastron	calcined	1-2cm	1
Mammalia	bone	calcined	0-1cm	11
Vertebrata	bone	calcined	0-1cm	125

(Area D, Sq. N5E4, Level 8)

Kinosternidae/Emydidae	shell	calcined	0-1cm	2
Vertebrata	bone	calcined	0-1cm	19

(Area D, Sq. N5E4, Level 8, SE)

Kinosternidae/Emydidae	shell	calcined	0-1cm	2
large Aves	long bone	calcined	0-1cm	1
Mammalia	bone	calcined	0-1cm	23
Vertebrata	bone	calcined	0-1cm	33

(Area D, Sq. N5E4, Level 8,NW)

Vertebrata	bone	calcined	0-1cm	18

(Area D, Sq. N5E4, Level 8, West)

large Mammalia	long bone	calcined	1-2cm	1
Mammalia	bone	calcined	0-1cm	2
Vertebrata	bone	calcined	0-1cm	46

(Area B, Sq. 0/9, Level 5)

large Mammalia	scapula	calcined	2-3cm	1

Table 2. Number of Identified Specimens (NISP) per Taxon from the Cactus Hill Site (44SX202), Sussex County, Virginia

Scientific Name	Common Name	NISP
Order Perciformes	perch-like fish	1
Rana catesbeiana	bullfrog	1
Lampropeltis sp.	king/milk snake	1
Kinosternon subrubrum	mud turtle	2
Sternotherus odoratus	stinkpot	1
Family Kinosternidae	mud/musk turtle	6
Chrysemys cf. *picta*	cf. painted turtle	1
Terrapene carolina	eastern box turtle	1
Family Kinosternidae/Emydidae	mud/box/pond turtle	30
Meleagris gallopavo	wild turkey	2
Indeterminate large bird	Indeterminate large bird	3
Indeterminate bird	Indeterminate bird	1
Order Carnivora	carnivore	1
Sciurus sp.	gray/fox squirrel	1
Ondatra zibethicus	muskrat	1
Odocoileus virginianus	white-tailed deer	14
Family Cervidae	deer/elk	8
Family Suidae	pig	1
Homo sapiens	human	1
Indeterminate large mammal	Indeterminate large mammal	7
Indeterminate mammal	Indeterminate mammal	168
Indeterminate vertebrate	Indeterminate vertebrate	846
	Total:	**1098**

Table 3. Temporal Distribution of Taxa Represented at the Cactus Hill Site (44SX202), Sussex County, Virginia

Taxon	E. Archaic	M. Archaic	L. Archaic	Historic	Unkn.
Perciformes	X	-	-	-	-
Rana catesbeiana	X	-	-	-	-
Lampropeltis sp.	X	-	-	-	-
Kinosternon subrubrum	X	-	-	-	-
Sternotherus odoratus	-	X	-	-	-
Kinosternidae	X	X	-	-	-
Chrysemys cf. *picta*	-	X	-	-	-
Terrapene carolina	-	-	-	-	X
Kinosternidae/Emydidae	X	X	X	-	-
Meleagris gallopavo	X	X	-	-	-
Indeterminate large bird	X	-	X	-	-
Indeterminate bird	X	-	-	-	-
Carnivora	X	-	-	-	-
Sciurus sp.	-	-	-	-	X
Ondatra zibethicus	X	-	-	-	-
Odocoileus virginianus	X	X	X	-	-
Cervidae	X	-	-	-	-
Suidae	-	-	-	X	-
Homo sapiens	-	X?	X?	-	-
Indeterminate large mammal	X	X	X	-	-
Indeterminate mammal	X	X	X	-	-
Indeterminate vertebrate	X	X	X	-	-

APPENDIX F

IMMUNOLOGICAL ANALYSIS OF CLOVIS ARTIFACTS FROM THE CACTUS HILL SITE (44SX202), SUSSEX COUNTY, VIRGINIA.

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In recent years there has been an increased use of molecular biological techniques in the analysis of archaeological materials. Immunological methods have been used to identify plant and animal residues on flaked and groundstone lithic artifacts (Downs 1985; Hyland *et al.* 1990; Kooyman *et al.* 1992; Newman 1990; Newman and Julig 1989; Yohe *et al.* 1991). Plant and animal residues on ceramic artifacts have been identified by their amino acid sequences (Broderick 1979) and by analysis of lipid and fatty acids (Fredericksen 1988; Heron *et al.* 1991; Hill *et al.* 1985) while serological methods have been used to determine blood groups in skeletal and soft tissue remains (Heglar 1972; Lee *et al.* 1989) and in the detection of hemoglobin from 4500-year-old bones (Ascenzi *et al.* 1985). Human leukocyte antigen (HLA) and deoxyribonucleic acid (DNA) determinations made on human and animal skeletal and soft tissue remains have demonstrated genetic relationships and molecular evolutionary distances (Hansen and Gurtler 1983; Lowenstein 1986; Pääbo 1985, 1986, 1989; Pääbo *et al.* 1989). It has become evident that data obtained from these analyses can contribute valuable information to archaeologists - information that cannot be obtained by other means.

Although various immunological methods have been used, the basis of all is the antigen-antibody reaction first observed in the classic precipitin test in the late 1800s. Following its discovery, the test quickly achieved integrity in the fields of clinical and forensic medicine and has been used extensively in medico-legal work since the beginning of this century (Gaensslen 1983). While the successful identification of protein residues is dependent on their condition, forensic studies have demonstrated that proteins are extremely robust molecules and can withstand harsh treatment while still retaining their antigenicity and biological activity (Arquembourg 1975; Haber 1964; Gaensslen 1983; Lee and DeForest 1976; Macey 1979; Sensabaugh *et al.* 1971, among others). The fact that valid results from the analysis of old and severely denatured proteins are obtained in forensic medicine is of special relevance to archaeology where 'old and denatured' proteins are the norm. The sensitivity and specificity of precipitin reactions makes them an extremely effective method for the detection of trace amounts of protein (Kabat and Meyer 1967:22).

Materials and Methods

Cross-over immunoelectrophoresis (CIEP) is used for the identification of bloodstains, body tissues and fluids in medico-legal work (Culliford 1964; Gaensslen 1983) and is the method of analysis used in this laboratory. Minor adaptations to the original method were made following procedures used by the Royal Canadian Mounted Police Serology Laboratory (Ottawa) and the Centre of Forensic Sciences (Toronto). The test is based on the principles of the precipitin test but affords a higher degree of sensitivity and can identify 10^{-8}g of protein (Culliford 1964; Gaensslen 1983). The procedure is discussed fully in Newman and Julig (1989).

Ten Clovis lithic artifacts recovered from the Cactus Hill site (44SX202), Sussex County, Virginia, were submitted for residue analysis. Possible residues were removed from the artifacts using a 5% ammonium hydroxide solution. This has been shown to be the most effective

extractant for old and denatured bloodstains and does not interfere with subsequent testing (Dorrill and Whitehead 1979; Kind and Cleevely 1969). Artifacts were placed in shallow plastic dishes and 0.5mL amounts of 5% ammonia solution applied directly to each. Initial disaggregation was carried out by floating the dish and contents in an ultrasonic cleaning bath for two to three minutes. Extraction was continued by placing the boat and contents on a rotating mixer for thirty minutes. The resulting ammonia solutions were removed with a pipette, placed in individual numbered plastic vials and refrigerated prior to further testing.

Initial testing of samples was carried out against pre-immune serum (i.e., serum from a non-immunized animal). A positive result against pre-immune serum could arise from non-specific protein interaction not based on the immunological specificity of the antibody (i.e., nonspecific precipitation). No positive results were obtained and testing was continued against the antisera shown in Table 1.

Table 1: Antisera used in analysis.

ANTISERA	SOURCE
anti-bear	Organon Teknika
anti-bovine	"
anti-cat	"
anti-chicken	"
anti-deer	"
anti-dog	"
anti-guinea-pig	"
anti-horse	"
anti-rabbit	"
anti-rat	"
anti-sheep	"
anti-camel	Sigma Scientific Co.
anti-pig	"
anti-elephant	University of Calgary
anti-elk	"

Antisera obtained from commercial sources are developed specifically for use in forensic medicine and, when necessary, these sera are solid phase absorbed to eliminate species cross-reactivity. However, these antisera are polyclonal, that is they recognize epitopes shared by closely related species. For example, anti-deer will give positive results with other members of the Cervidae family such as deer, moose, elk and caribou as well as with pronghorn (Antilocapridae family). Two additional antisera, to elephant and elk, were raised at the University of Calgary. The elk, raised against modern species (*Cervus canadensis)* is species-specific while the elephant, raised against serum from modern African elephant, will detect extinct and extant members of the order Proboscidea.

Results

The results of CIEP analysis are shown in Table 2 and discussed below.

Positive results to bovine antiserum were obtained on three artifacts, #s 1, 7 and 9. Positive reactions to this antiserum are obtained only with bison, muskox and cow of the Bovidae family. Cross-reactions with other families do not generally occur with this antiserum.

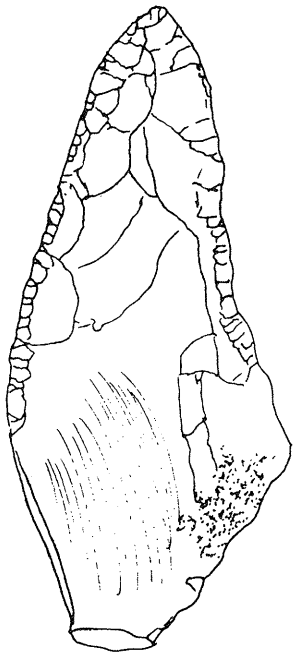
Two artifacts, a Clovis point and a graver, tested positive to deer antiserum. As noted above, these results may represent any member of the Cervidae family. However, one of these artifacts, a fluted point (# 3) also elicited a positive reaction to species-specific elk antiserum. Thus the species represented on this artifact is elk (extinct or extant form).

Positive results to rabbit antiserum were obtained on two artifacts (#s 5 and 9). Positive results to this antiserum are obtained with all members of the order Lagomorpha (rabbits, hares and pikas) but cross-reactions with other orders do not generally occur. The identification of two distinct species on artifact # 9, a graver, suggests the dual use of the implement or that blood or sinews of one of them may have been used in a hafting process.

No other positive results were obtained in this analysis. The absence of identifiable proteins on artifacts may be due to poor preservation of protein or that they were used on species other than those encompassed by the antisera. It is also possible that the artifacts were not utilized.

Table 2: results of CIEP analysis.

Artifact #	Artifact type	Result
1	Side scraper	Bovine
2	Fluted point	Negative
3	Fluted point	Deer, **elk**
4	Fluted point	Negative
5	Edge worked flake/graver	Rabbit
6	Graver	Deer
7	Edge worked flake	Bovine
8	End scraper	Negative
9	Graver	Bovine, rabbit
10	End scraper	Negative



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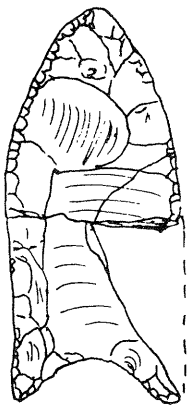

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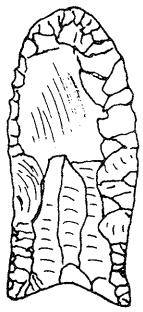

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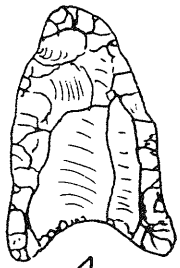

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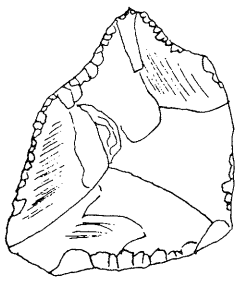

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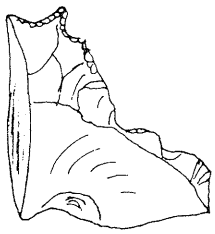

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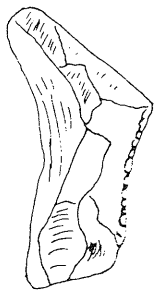

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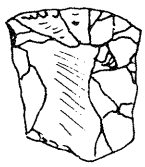

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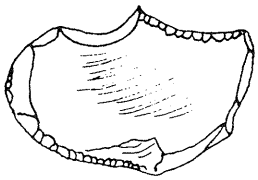

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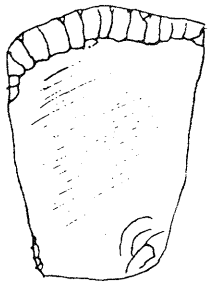

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APPENDIX G

Additional Research at Cactus Hill: Preliminary Description of Northern Virginia Chapter-ASV's 1993 and 1995 Excavations

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Acknowledgments

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The following field and lab crew members (in alphabetical order) provided the bulk of the work that made this report possible: Donna, Carol, and Susan Blosser, Joan Cameron, Al Clarke, Chuck Cornelison, Charles (C.D.) Cox, Brad Fyok, Mark Joseph, Rick Koestline, Joel Langert, Preston McWhorter, Bob Norton, Al Pfeffer, Doug and Connie Price, Anne Schwermer, Dave Shonyo, Vicki Via, and Craig Weinstein.

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Introduction

In the spring of 1993, Annette Barr of Petersburg, Virginia, notified the author of three potential fluted points in Sussex County, Virginia. During the recording visit to the Barr's home, it was determined that two of the points were worthy of inclusion in the McCary Fluted Point Survey (See fluted points #930 and #932 in Johnson and Pearsall 1995). The Barr family led the author and Joyce Pearsall to the site where the points were recovered, which turned out to be an active sand quarry owned by the Union Camp Corporation (Figure 1). It should be noted that the Barrs had permission from Union Camp to be on the property when they recovered the fluted points.

Confronted with a serious threat to what was obviously a stratified Paleoindian component, the author called Joe McAvoy who had spent many years surveying and excavating in the Nottoway River drainage of Sussex and Dinwiddie counties (McAvoy 1992). It was also obvious during the visit that the site was actively being destroyed by artifact hunters who had dug numerous deep potholes. With the discoveries made at Cactus Hill, Union Camp has withdrawn permission to collect on the site and posted the property against trespassing. However, the site continues to be destroyed by looters who sneak into the site. The term looter will be used henceforth in this part of the report to refer to those who violate the property rights of Union Camp by illegally entering the site in their pursuit of artifacts. It does not refer to artifact collectors, many of whom assisted in the 1993 and 1994 archeological excavation of Cactus Hill, and who obey the law.

Although McAvoy had tested the site in the late 1980s, it was agreed that the new information from the Barr family and the serious threat from both sand quarrying and looting indicated that a major effort to salvage a portion of the site was warranted. Based on McAvoy's knowledge of the site and the logistics of multiple Archeological Society of Virginia (ASV) chapter involvement, a two-pronged approach was devised. The Northern Virginia Chapter (NVC), under the author's direction, was assigned to an area on the south side of the quarry where the Barr's had recovered the two fluted points. As can be seen from Figure 2, the Northern Virginia Chapter excavation, designated area A, was a significant distance (approximately 350 feet) from the Nottoway River. McAvoy's previous testing had indicated that portions of the site were disturbed by a later Woodland occupation nearer the Nottoway River. The potential for undisturbed strata was thought to be better further away from the river. Area A was also predicted to have fewer artifacts which would make it easier to detect isolated activity areas in the uniform sand matrix. The Greater Richmond and Nansemond Chapters of the ASV, under McAvoy's direction, were assigned area B, and area C was only scheduled to be tested (see McAvoy, this volume). Due to predicted tolerable weather conditions and a predicted decreased in biting insects, the excavation was scheduled for the first two weeks in October.

The author, through the ASV, was able to obtain a Threatened Sites grant from the Virginia Department of Historic Resources. These funds were critical to ensuring the participation of the NVC's volunteers and to purchase equipment and supplies. Additional assistance was provided by the Virginia Commonwealth University Archeology Club and Anthropology Department, which provided both crew and a surplus Army command post tent. The tent, which was pitched at a nearby KOA campground, served as a field headquarters and lab for the Area A (NVC) crew.

Due to problems with stratigraphy in 1993, discussed below, the NVC made a second trip to the site in early April of 1995 in order to better identify the cultural stratigraphy. The research design called for a much less ambitious excavation in terms of horizontal coverage. The focus was on vertical control. Again the Virginia Department of Historic Resources provided basic funding support from its Threatened Sites Fund.

Although the NVC, through the McCary Fluted Point Survey, was the catalyst for re-opening investigations at Cactus Hill, it was decided that its efforts would be supportive of McAvoy's research in the region. Excavation techniques were designed to be consistent with those used by him.

In that vein, this part of the report is designed to provide supporting data to the core report by McAvoy. However, the analysis is independent. In accordance with McAvoy's desires for an objective test, the data and analysis in this report has not been coordinated in any way other than through point typologies.

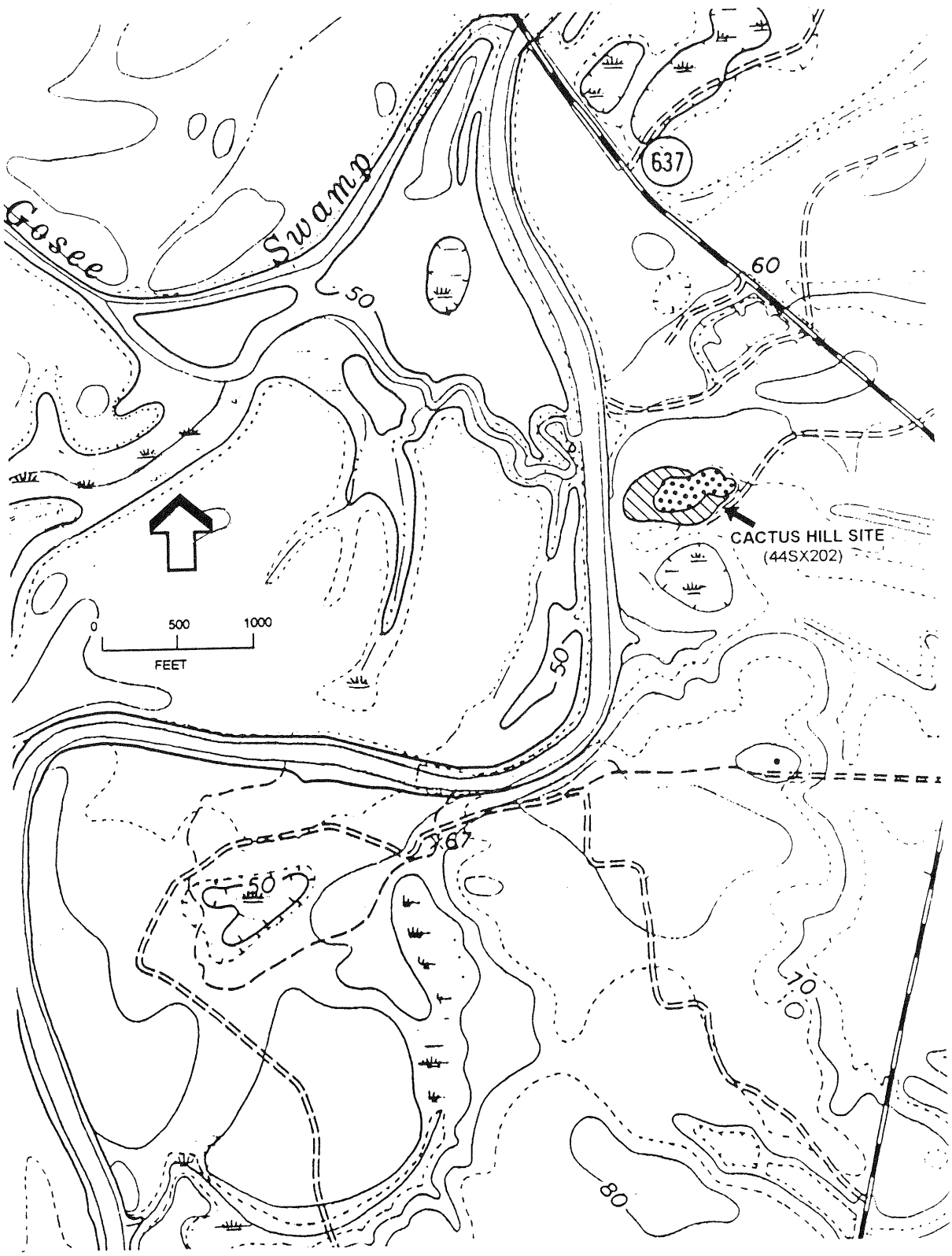

Figure 1. General context for the Cactus Hill Site (44SX202). Dotted area indicates area destroyed by modern sand quarry.

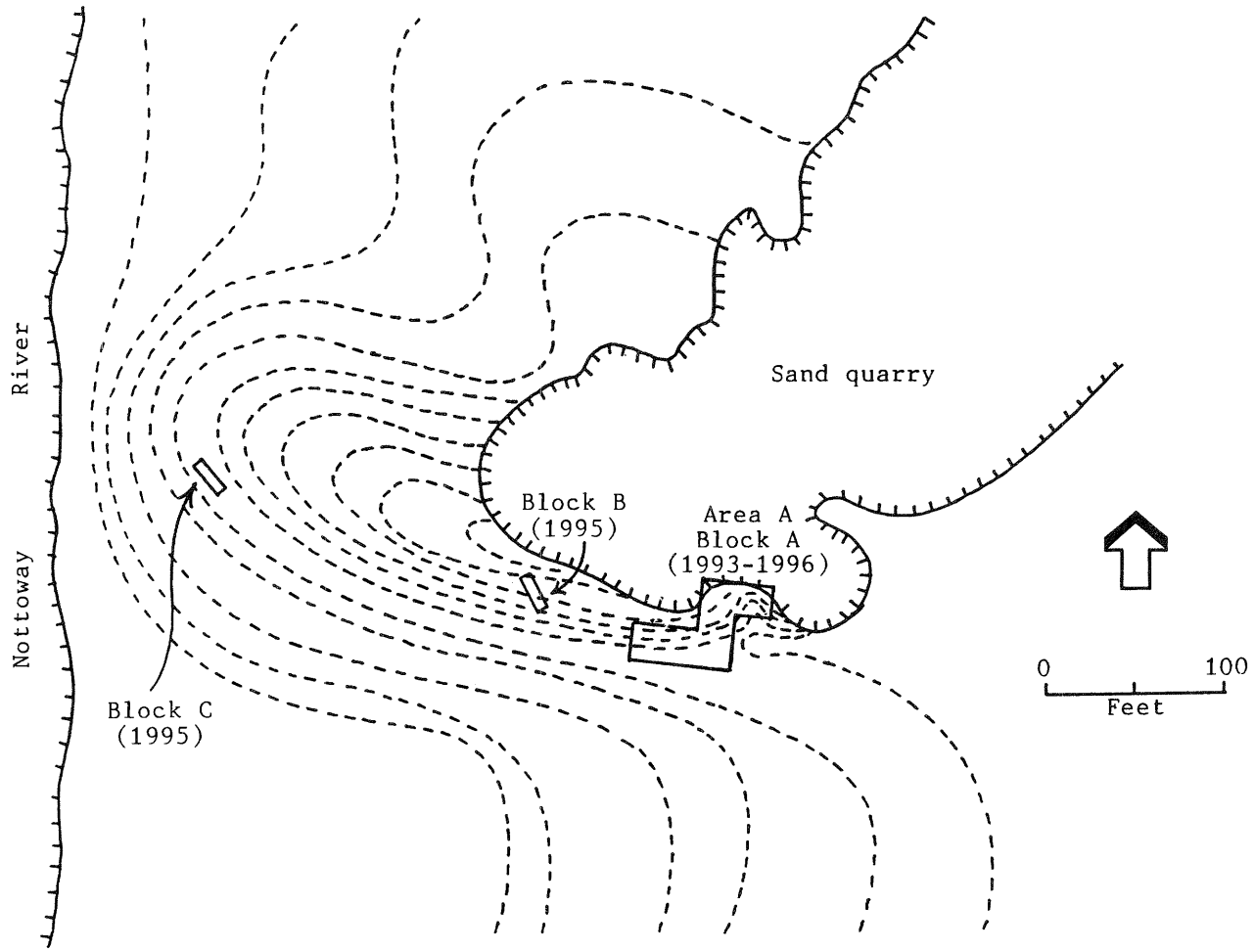

Figure 2. Internal site context for NVC Blocks A, B, and C (Map redrawn from McAvoy, this volume).

Field Methods

1993 Excavation

Due to the perceived immediate threat to the site from both sand quarrying and looters, the first year's excavation was designed to investigate horizontally as much as was possible within a two week period. Maximizing horizontal coverage was aimed at increasing the possibility of discovering Paleoindian activity areas which were expected to be ephemeral in area A. Although the site was known to be rich in Early and Middle Archaic occupations, area A was designed primarily to locate Paleoindian remains.

Since the area had a mixed plow zone known to contain Late Archaic (post-Savannah River) and Woodland material, the plow zone in area A was removed by a bulldozer. The exposed area encompassed approximately 1,100 square feet. This was expanded by another 250 square feet during the last week of the excavation.

Horizontal control was maintained by a ten foot grid, consisting of two contiguous rows of 10x10 foot excavation units aligned in an east-west direction along the southern edge of the quarry (Figure 3). A row of single units was extended to the north from the eastern-most end of the main block. The result was an L shaped block. The initial 1,100 square foot block was later extended, first to the west by two half (5x10 foot) units. Near the end of the excavation, whole unit 14 and half of unit 15 were added to the north end of the east side of the block.

Unit 7 was not excavated. It was discovered early that it was situated almost exactly over a large pothole, which could be identified by a marbled matrix of dark humus and light subsoil. Units 10 and 11 were not excavated beyond leveling the exposed surface. Unit 8 was excavated to only level 6 because of time constraints and low priority. These units were considered to be of lower priority than units 12 through 15, because they were the farthest away from the site's centerline as determined by McAvoy. The centerline of the sand dune containing the site was thought by McAvoy to have the highest potential for Paleoindian occupation. It had been largely removed by the quarry.

Vertical control was maintained by use of two water levels. The water level, designed by volunteer, Dave Rubis, has proven to be dramatically more accurate and easier to use than line levels. Figure 4 shows one being used during the 1995 excavation.

Arbitrary two-inch levels were chosen in order to be consistent with McAvoy's excavations. Level control in the large units was maintained by pre-excavating small, two-inch deep trowel holes in the corners, the center of each wall, and in the center of the units. A two-inch long, flat-head nail, painted in a florescent color, was driven to the target depth in the hole. Square, rather than pointed, finishing trowels were used to increase accuracy in the soft sand. The remainder of the unit was either carefully flat shoveled, skimmed with dust pans, or troweled. Upper levels were more often flat shoveled. Only features and diagnostic artifacts were mapped and plotted in three dimensional coordinates.

Sand matrix was sifted through 1/4 inch hardware cloth. Obvious pebbles and soil concretions were discarded at the screens. As a result, some potential environmental information was lost. This methodological error was corrected during the 1995 excavation. All stone and ceramic artifacts were recovered and bagged by unit and level.

Charcoal was common throughout the levels. However, the only charcoal recovery was made from pedestals under feature artifacts and selected large cobbles. This was accomplished by recovering an inverted cone of sand from under each large rock in each feature. This sand was later screened through graduated sieves where the charcoal was picked out of the coarsest two mesh sizes (U.S. Bureau of Standards sieve sizes 6 and 20). McAvoy had pointed out that before the 1993 season he had gotten inconsistent dates from level charcoal, because upper level charcoal seemed to have a tendency to migrate down in the sand. It was hoped that the sand shadows under the larger and relatively undisturbed rocks might have been protected from contamination. Some level charcoal, as well as soil concretions, did survive the 1/4 inch sifting. They were recovered in the lab. A more thorough attempt to recover charcoal, soil concretions, and pebbles was made during the 1995 excavation.

All artifacts and sand samples were returned each day to the field lab. A preliminary artifact washing and sorting was done at that time. Initially, obvious fire cracked rocks and any remaining pebbles were discarded. The fire cracked rocks were counted and recorded by raw material before discard. All sorted artifacts were re-bagged in ziploc bags and returned to their field bags before boxing for eventual

Figure 3. NVC excavation grids for Blocks A, B, and C (relationships between blocks are not to scale).

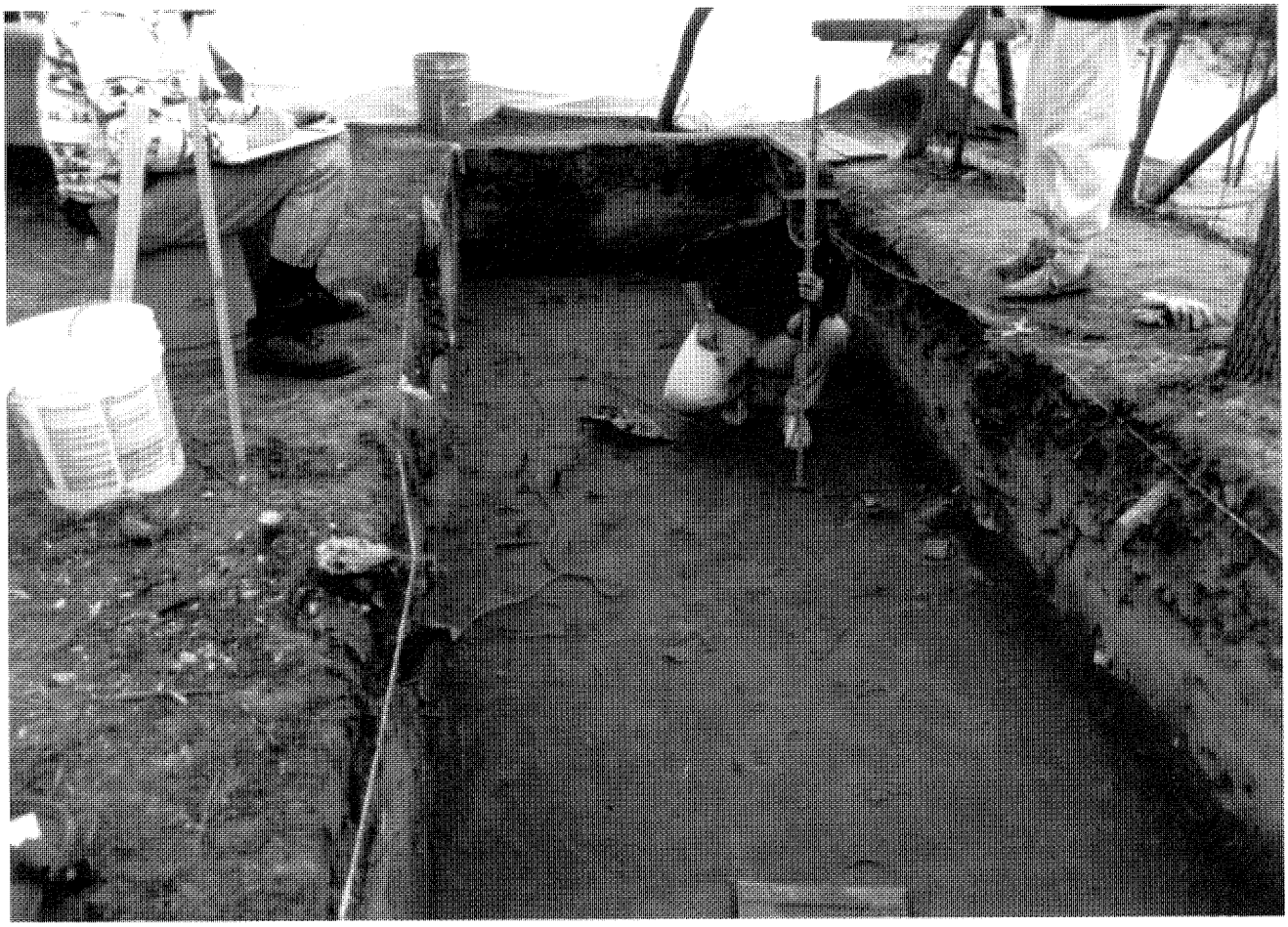

Figure 4. Annette Barr (fluted point reporter) using water level to measure depth on artifact in Block B, Unit 16.

transport back to Northern Virginia. Later, during the 1993 excavation and during the entire 1995 excavation, fire cracked rocks were retained.

1995 Excavation

The fact that the arbitrary levels used in 1993 were not synchronized with the cultural levels was not discovered until after the 1993 excavation. As a result, after the lab work on 1993 was completed, a second, more limited excavation was undertaken in 1995. The purpose was to better identify the cultural stratigraphy and to obtain a sample of functionally diagnostic artifacts that could be stratigraphically tied to the chronologically diagnostic artifacts.

A secondary objective was to get a broader sample of the stratigraphy. To that end, two trenches were laid out, and designated blocks B and C (Figures 2 and 3). Each trench consisted of two half-units (5x10 foot) placed end to end, making two 5x20-foot trenches. A fifth half-unit, designated B18, was laid out in an area thought to have a higher potential for Paleoindian remains. This was next to unit B16, which was as high up on the dune as possible. Unit B18 was not dug because it took the full two weeks to excavate the two trenches.

Block B was oriented to avoid looter holes and trees. Block C was oriented to be parallel with rows of planted sweetgum trees and was situated as close to the top of the dune line while avoiding looter disturbances. As a result, the two blocks were not oriented along cardinal directions.

Most importantly, the plowzone was excavated rather than mechanically removed. As a result, the starting slope of the arbitrary levels to the south was more severe than that of the 1993 levels. The plan was to adjust the levels as the trench was excavated, based on cultural slopes determined by marking diagnostic point finds with nails and labels in the adjacent walls. This technique was observed being used by McAvoy in 1994 in his area D excavation. It was quickly determined that the natural slope closely matched the cultural stratigraphy. It became clear that, in stripping the plowzone in 1993, the bulldozer had altered the natural and cultural stratigraphy in the upper levels of block A, which meant that the arbitrary excavation levels were not synchronized with the cultural levels.

The only difference between the 1993 and 1995 excavation techniques were that in block B all artifacts larger than a quarter were mapped in three dimensions with top and bottom elevations; related, a significantly greater proportion of each level was troweled rather than flat shoveled, and everything, including pebbles was recovered. This assured a better chance of relating functional diagnostics to chronological diagnostics. However, in block C extensive mapping of non-diagnostic artifacts was not done until late in the excavation when it was clear that there was sufficient time to complete the block (Figure 5). Everything that failed to pass through 1/4 inch mesh screen was recovered. As a result, consistent samples of pebbles, insect and other concretions were recovered. Also, sand columns were recovered from unit 16 in block B and unit 20 in block C. These were recovered to provide a more systematic sand sample for particle size analysis. Level control, using water levels, and all other aspects of the field work were technically the same as were used in 1993.

Lab Techniques

1993 Excavation

Artifacts from each unit and level were rinsed in tap water and initially sorted by raw material. They were then sorted into categories in accordance with the Fairfax County, Virginia Park Authority's Archaeological Services artifact inventory system. The following discussion pertains to descriptive classes used:

Debitage (DE): This category encompassed all byproducts of the flintknapping process, including flakes, flake fragments (proximal, distal, medial, striking platforms, pressure and percussion flakes, etc.), and shatter (due to flaws in the stone, knapper error, bipolar cobble splitting, and angular vs. bifacial core reduction). Because the presence of **cobble cortex (CX)** is indicative of a secondary procurement source (cobble quarry rather than bedrock outcrop), it was employed as a modifier, initially to debitage and later to only other more complex artifacts. Later, during cataloguing of the 1995 artifacts, obvious examples of **bipolar (BP)** debitage were separated out. It was clear from the very outset of the 1993 excavation that bipolar cobble splitting and high angle core reduction were very common on the site. The lab work also identified several wedge-like tools (*piesces esquillees*) in the lower levels. The notation of bipolar activity was designed to flag its occurrence for future functional and technological analysis.

Fire cracked rock (FR): This category included all broken rocks and any unbroken rocks that exhibited signs of burning. The attributes are crazing,

Figure 5. Al Pfeffer (foreground), Greater Richmond Chapter, and Joyce Pearsall, Northern Virginia Chapter, mapping feature artifacts in Block C, Units 19 and 20, Level 8.

blackening or reddening, variegated breaking including blocky chunks, cupped spalls similar to potlids, and (in the case of some quartzite) an apparent thermal destruction of the bonding between sand grains, i.e., the equivalent of crazing in quartz. Combinations of the attributes were preferred. On rare occasions, pieces of FR were observed to have been modified or worn, either before or after burning. These were not included in the FR, but were annotated as having been **thermally altered (TA)**.

Modified/worn lithic (MW): All artifacts exhibiting any sign of modification or wear, except recognizable flake striking platforms which often possess platform preparation, were included in this category. This category was a catch-all for tools, broken tools, split cobbles, angular cores, core fragments, and any artifact with a damaged or worked edge. Any item with an edge possessing one or more scars from flake platforms or bulbs of percussion were included. Artifacts possessing an edge with polish, nicks from twisting, or crushing were also included under the general MW category. Within this category other descriptions may be made:

1. Cobbles and cobble fragments with one or more pits or high angle impact scars, or crushed surfaces from repeated battering were included as MWs, but were further sorted as **pecked/pitted (PP)**.

2. Examples of modification or wear involving the production of a **spur (SP)** became increasingly evident during the preliminary sorting and were pulled out. However, the high volume of debitage (commonly over 1,000 in one level of one unit) made recognition spotty. Their inclusion in the data only reflects presence, not absence, and was done with greater accuracy in the 1995 inventory.

3. **Uniface (UF)** referred to a modified/worn artifact with an edge that had been systematically flaked, primarily, in only one direction, i.e., beveled. It did not include unifacial damage unless it was not clear if the damage was the product of intentional flaking. In this and most other cases, it was decided to catalog the artifact at the highest obvious degree of modification, so as to make recovery easier later.

4. **Biface (BI)** included all biface forms except recognizable points. Preforms and bifacial cores were subsumed under this category. Bifacially worked edges on debitage also were included in the general MW category.

5. It is recognized that **points (PT)** generally are specialized bifaces. However, they are temporally diagnostic and therefore were isolated in the inventory. **Tips (TI)**, **midsections (MS)**, and other unidentifiable **fragments (FG)** can be isolated with modifiers to help later retrieval. The cataloging system allows for other descriptive modifiers, such as **bifurcated base (BI)**, **contracting stem (CS)**, **corner notched (CN)**, **fluted (FT)**, **ground (GR)**, **lanceolate (LA)**, **lobate (LO)**, **notched (NT)**, **pentagonal (PE)**, **serrated (SR)**, **side notched (SI)**, **stemmed (ST)**, and **triangular (TR)**.

Ceramic pottery (CP): The Woodland period was not a focus of this project, because of the project's emergency nature and the majority of the ceramics were stratigraphically contained in the plowzone. Additionally, intrusive Woodland features were unrecognizable in the subsoil. The presence of Woodland pottery sherds and points were used as markers of disturbance. Where recognized, potsherds were treated as diagnostic artifacts. The CP designation included any prehistoric ceramic technology. The term marked referred only to technology. For example, a cord wrapped paddle used to press the pot preform's coils together leaves irregular marks. Such a sherd would have been cataloged as **cordmarked (CM)**. In the case of cord wrapped stick and individual cord decoration the term **cord impressed (CI)** would be used. Thus, impressed referred to obvious decoration. That distinction was used for all surface treatments, whether cord, fabric (**FM** vs. **FI**), or net (**NM** vs. **NI**).

Ceramic unidentified (CU): This category was used to catalogue soil concretions and the numerous mud wasp nest fragments that were present throughout the site. The nests were considered important, because they may contain biological or cultural information. For example, if the mud wasp nests were attached to parts of structures, it is possible that the impressions of hides, mats, or debarked poles may be detected on the attachment areas of the nests.

Analysis is still pending on charcoal and bone.

1995 Excavation

With one exception (the use of surgical gloves to handle 1995 artifacts), the same lab techniques were used for both the 1993 and 1995 artifacts. By the time of the 1995 excavation, McAvoy had received

results from immunological tests on his oldest tools from the 1993 excavation. The results of similar tests on artifacts from block A of Cactus Hill, and the Fifty (44WR50) and Thunderbird (44WR11) Paleoindian sites in Warren County, Virginia, (Gardner 1974) indicated a potential for identifiable blood residues (Table 1). Because of the visible (under binocular microscopic analysis) indication of human residue on the Thunderbird and Fifty samples, which have been heavily handled since their recovery some 20 years ago, all artifacts from the 1995 Cactus Hill excavation were handled with surgical gloves.

However, the effectiveness of blood residue analysis as an archeological technique has recently come under criticism (Downs and Lowenstein 1995; Eisele, et al. 1995; Fiedel 1996). The results of blood residue tests on selected Cactus Hill, Fifty, and Thunderbird artifacts are presented here because they were done. No value judgements or inferences are being made.

Another minor change was in the tabulation of meta-volcanic artifacts. Whereas the attempt was made during cataloging to separate Carolina slate (silicified volcanic tuff) from rhyolite, all of the meta-volcanics were quantitatively combined for this report under the meta-volcanics heading.

Particle size testing was done on samples of pedestal sand from the features in block A. Columns of 2x2x1 inch samples from wall profiles in block B, unit 16 and block C, unit 20 were also sorted for particle sizes. Testing was done using U.S. Bureau of Standards sieve sizes 6, 20, 40, 60, 100, and 230. Any clay particles that made it through the finest mesh (230) were recovered and treated as a part of the analysis. The sand from each sieve was bagged and retained. An analysis of the results are contained in the analysis section of this part of the report.

Data and Analysis

The focus of this report is on the vertical separation of cultural levels. Because there was no obvious soil differentiation (Figure 6), accurate cultural stratigraphic analysis is essential. However, even identifiable cultural stratigraphy cannot be taken literally. Vertical artifact drift, particularly of smaller items, was evident in all units and levels. This was clearly facilitated by the sand matrix. The larger items seem to have had less of a penchant for moving, as will be shown with the numerous mends within some features. Diagnostic points and, to a lesser extent, pottery also appear to have mostly held to their original levels.

Since no C-14 dating or functional analysis of the tools has been done on the NVC data, the following will be concerned with only gross artifact quantities from the inventory, relative dating based on temporally diagnostic artifacts, stratigraphic analysis, and preliminary analysis of features. As samples are processed and tools are analyzed, additional articles will be published.

Approximately 110,500 items were inventoried from the three blocks. Unit 16 produced the highest quantity of artifacts, by far, with 17,168. This is noteworthy because it encompassed only 50 square feet while many of the units in block A were full 10x10 foot units. It also produced over 3,000 more artifacts than unit 20 in block C, which was closer to the Nottoway River, where one would expect a more intense occupation. These numbers reflect gross figures including every time period on the site. Chronologically, the three blocks show differences in occupation across space and through time.

Block A - Figure 7 shows a summary of identifiable point types recovered from block A. Tables 1-1 through 1-10 (Attachment 1) show the distribution of other, non-diagnostic artifacts in this block. Every major local point type except the unfluted lanceolates (identified by McAvoy in the first section of this report), Kirk Corner notched/Side notched, Stanly, Potts, and triangles were recovered from block A. One small possible fluted point fragment and a quartz lanceolate (?) fragment were recovered from the deepest levels in unit 14 which was in the northeast corner of the block. Although not shown in the table, the lower levels produced an increased quantity of Nottoway River chert, which is commonly associated with Paleoindian occupation (see Attachment 1). Additionally, a high quality meta-volcanic ramped endscraper was recovered from the same level (9) as the fluted point fragment. This area of the block was where the potential for Paleoindian occupation was considered highest. The only Hardaway point from the three blocks was recovered from level 6 in this unit (Figure 8). A large Palmer-like corner notched base was recovered from the same level as the Hardaway and a serrated, large Palmer-like corner notched midsection was recovered from level 11 of unit 6 (Figure 9). Seventy-one sand tempered, cordmarked Prince George-like sherds and one Rossville/Piscataway-like point were recovered from the upper levels of the block. With the

Table 1. Blood residue results from CIEP (cross-over immunoelectrophoresis analysis of selected artifacts from 44WR11 (Thunderbird), 44WR50 (Fifty) and 44SX202 (Cactus Hill) (Newman 1995:6).

Site	Artifact	Result
44Wr11	Fluted point	Cat, human
44WR11	Fluted point blade	Human
44WR11	Fluted point tip	Negative
44WR11	Fluted point	Negative
44WR50	Fluted point blade	Bear
44WR50	Fluted Point	Rabbit, human
44SX202	Endscraper	Negative
44SX202	Fluted point fragment (?)	Negative
44SX202	Modified flake	Deer, elk
44SX202	Point blade	Negative
44SX202	Worn flake	Negative
44SX202	Decatur point	Negative
44SX202	Bifurcate point	Negative
44SX202	Kirk point	Negative
44Sx202	Uniface	Negative
44SX202	Ft. Nottoway point	Negative
44SX202	Worn flake	Negative
44SX202	Uniface	Negative
44SX202	Endscraper	Negative
44SX202	Palmer point midsection	Negative

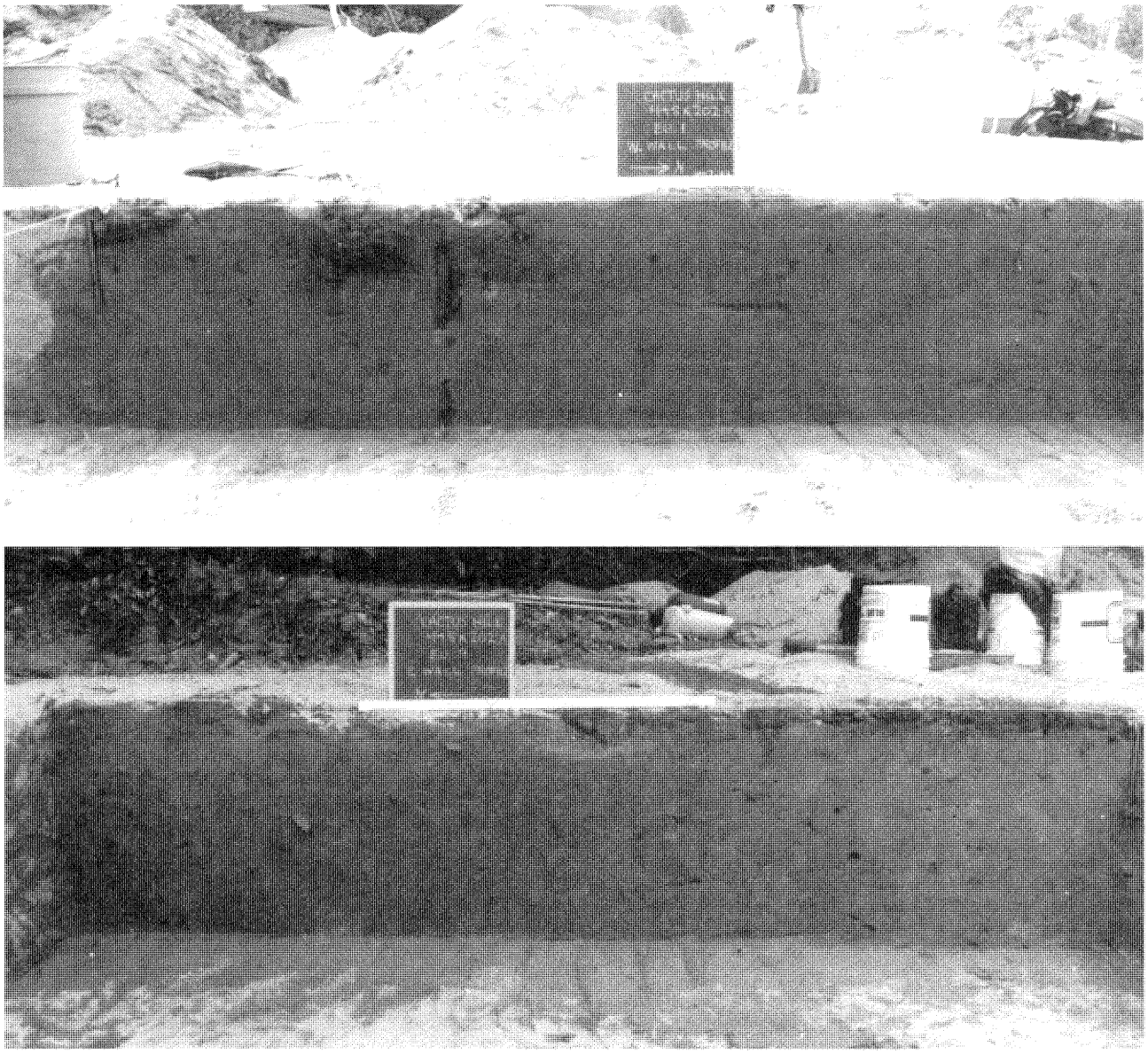

Figure 6. Final ten-foot long wall profiles from the west wall of Unit 1 and the east wall of Unit 9, at opposite ends of Block A.

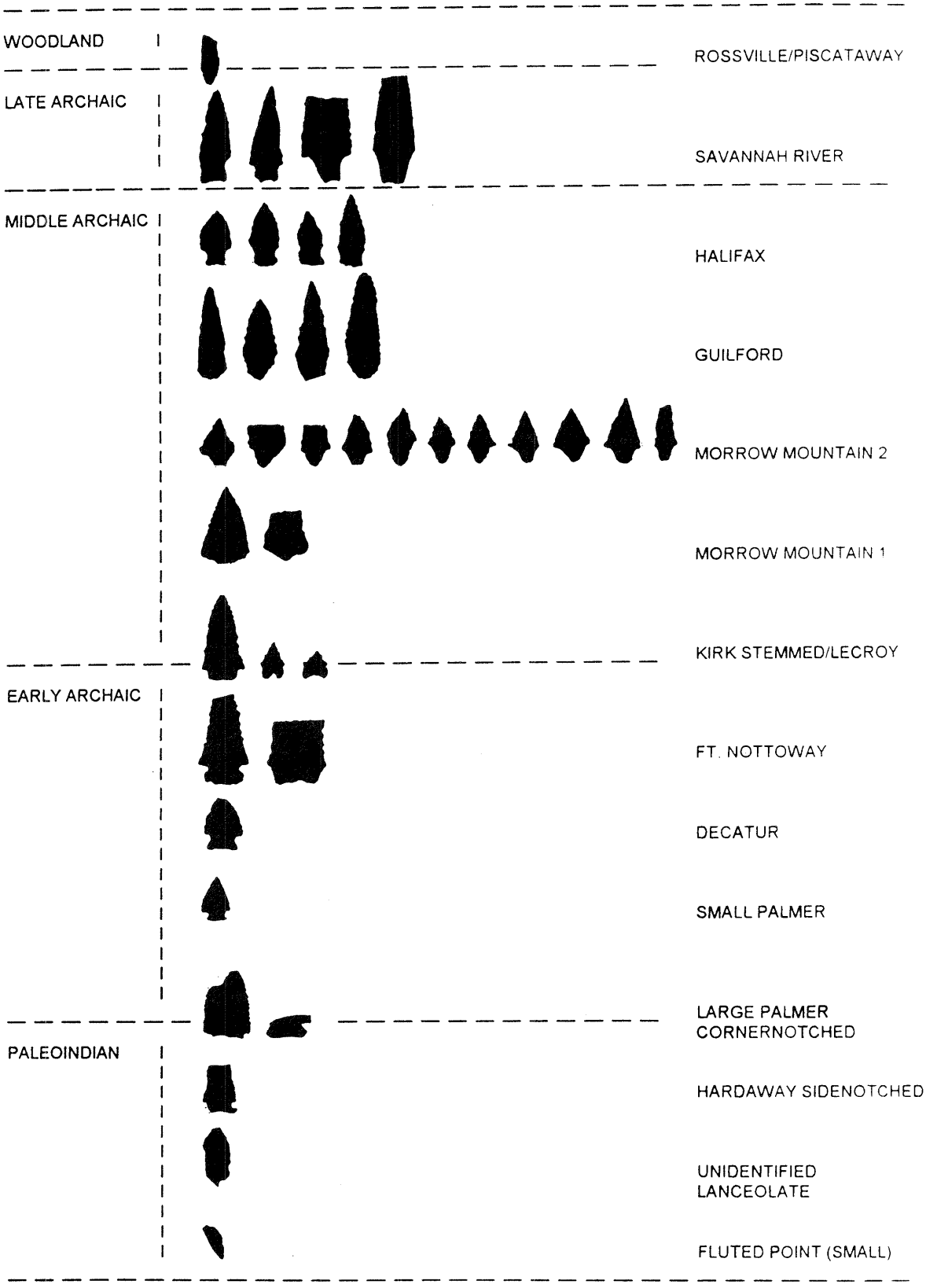

Figure 7. Relative vertical distribution of points from within Block A.

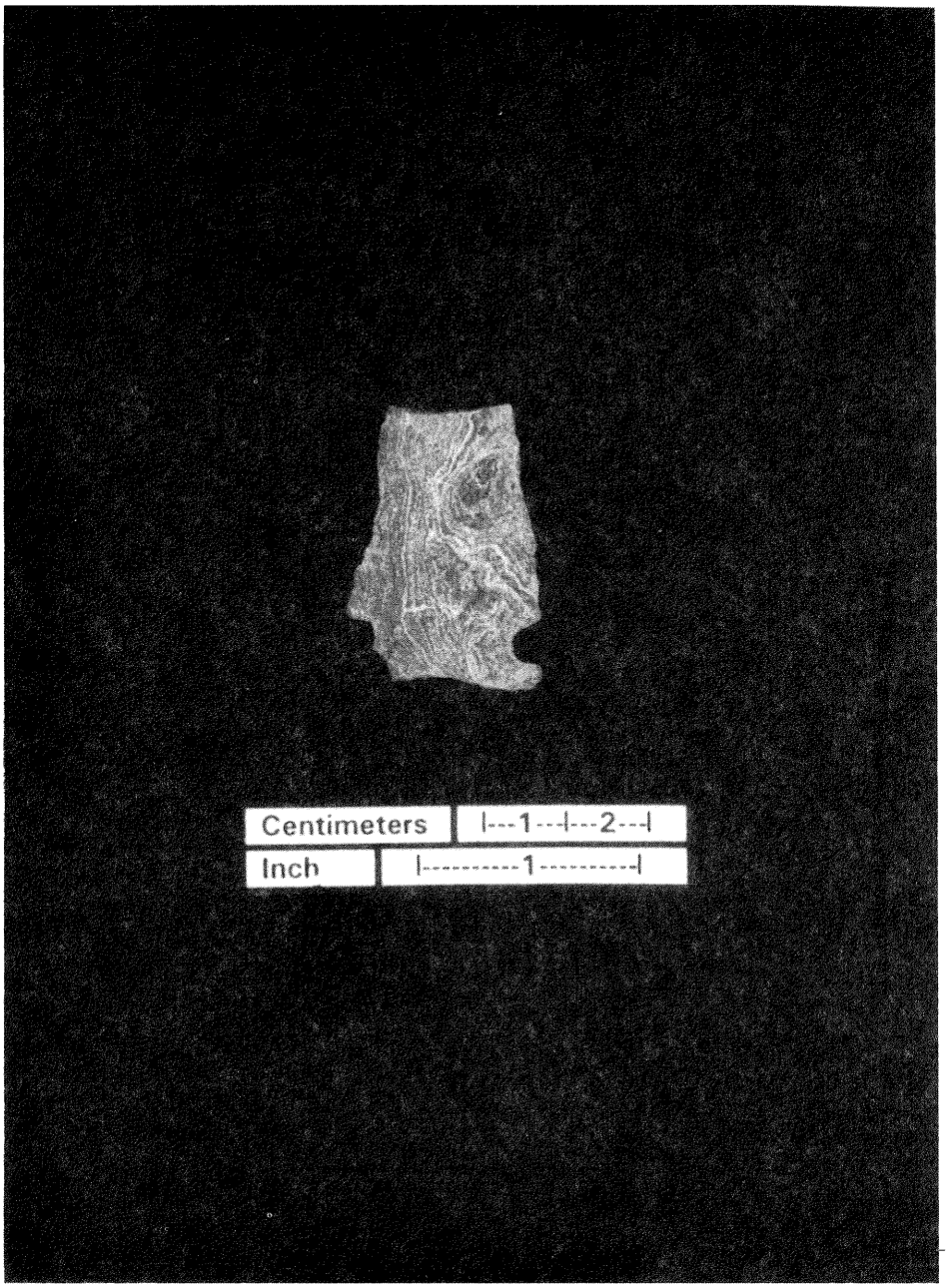

Figure 8. Weathered metavolcanic Hardaway side notched point from Unit 14, Level 6.

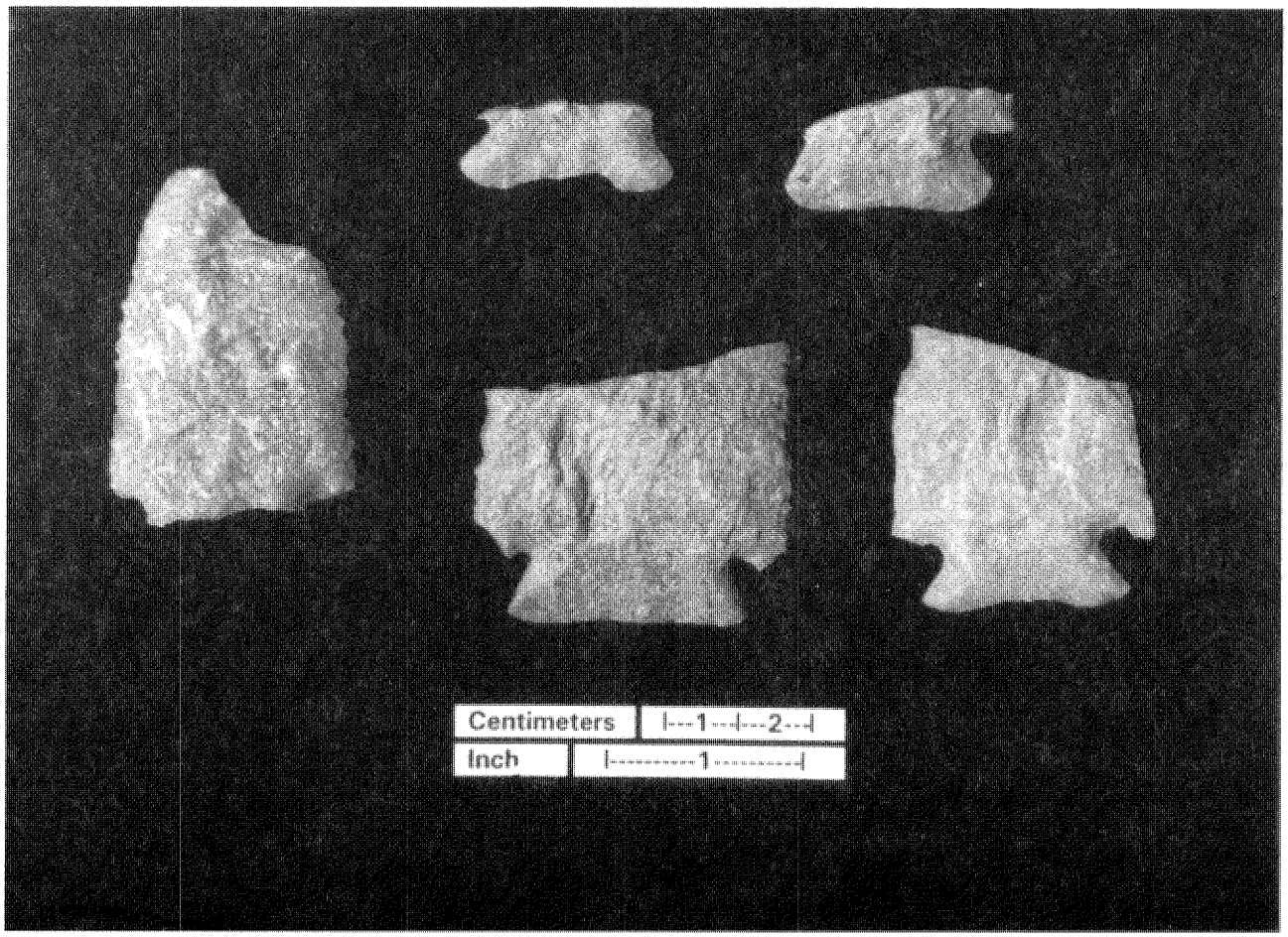

Figure 9. Examples of large quartzite Palmer-like corner Notched points from the Cactus Hill site.

exception of ceramics, Woodland diagnostics were noticeably scarce.

Although the quantity of artifacts per unit was low when compared to blocks B and C, block A does offer the potential for better horizontal sorting. The area around the northeast corner of the block retains the best chance for *in situ* Paleoindian remains. Feature A10 in level 8 of unit 15 is a strong candidate for an early date. Feature A2 from levels 9 and 10 of unit 9 may also be early. No other part of the block produced any artifacts or features that appeared to be earlier than large Palmer-like corner notched, i.e., before ca. 8,200 B.C. (McAvoy, personal communication).

Because the plowzone of this block had been mechanically removed and its slope altered (leveled) by the bulldozer, some adjustments were made to the upper levels in order to make the slope of the arbitrary levels correspond as closely as possible to the perceived land form. Figures 2-1 through 2-7 in Attachment 2 represent only the relative vertical relationships between diagnostics and levels. With Morrow Mountain points being the most numerous by far, the bottom of the Morrow Mountain zone could be estimated for the main body of the excavation which included units 1 through 6 (Figures 2-1 through 2-3). The bottom of the zone extends from the boundary of levels 6 and 7 at the north end of each figure to the boundary of levels 8 and 9 at the southern end. Note that the figures represent 20 feet of horizontal distance and the actual levels were only two inches thick. The arbitrary level slope was off by about two inches over a distance of 20 feet. The magnitude of the slope will be more evident later, during the explanation of the features.

Units 9 and 14 (Figure 2-5) also show a termination of the Morrow Mountain zone in levels 9 and 14. However, it starts at the level 3 and 4 boundary at the northern end of unit 14, and over the 20 feet of horizontal distance drops to the boundary between levels 6 and 7 at the southern end of unit 9. As one can see from Figure 3, the southern edge of units 9 and 14 correspond to the northern edge of units 1, 3, and 5. The drop across the 20 foot span of units 9 and 14 is six inches. It means that the stratigraphy appears to be more precipitous, compressed, and higher in the profile at the northeastern end of block A.

Using only one Guilford and one Morrow Mountain point, an effort was made to hypothesize the upper extent of Morrow Mountain in Units 12 and 13 (Figure 2-6). The Guilford point appeared to be associated with a largely horizontal feature that extended across most of unit 12. As a result, the bottom of the feature is projected to be the top of the Morrow Mountain zone (see feature discussion below). If correct, this would mean that in the area of block A the Morrow Mountain zone is about six inches thick.

The top of the Morrow Mountain zone is much more difficult to identify because there seems to be more impact on upper levels from Woodland intrusions. Note that in unit 2 (Figure 2-1) sand tempered cordmarked sherds were recovered as deep as level 6. In unit 4 (Figure 2-2), three sherds were recovered from level 5. In unit 5 a sherd was recovered from level 4, and in unit 6 one sherd came from level 6 and nine sherds came from level 5 (Figure 2-3). Sherds were found as deep as level 3 in both unit 9 and 14 (Figure 2-5).

The shallower penetration of pottery in units 9 and 14 could indicate that more sand was removed from the northern or up-hill portion of the site during the mechanical elimination of the plowzone, or that the entire profile was more compressed there. Throughout levels 3-6, depending on where one was in the block, there was a clear mixing of Savannah River, Halifax, Guilford, and Morrow Mountain points. The northern half of unit 9 also appears to have been impacted by a large intrusive feature which will be discussed later.

Since the only Small Palmer point found in block A came from level 4 in unit 14, the only Late Paleoindian Hardaway Side notched point in the block came from level 6 of the same unit, and two probable fluted point fragments came from levels 8 and 9 of unit 14, six inches probably were removed. Palmer, Hardaway, and fluted points from unit 14 would be more consistent with the cultural stratigraphy in the rest of the three blocks excavated by the NVC if they had been recovered from 3 levels deeper. While participating in McAvoy's 1996 excavations it was pointed out by McAvoy and later observed, personally, that the stratigraphy near the top of the dune was different than lower down (to the south). It appears that the Paleoindian occupation was on the top of a dune that was truncated along its southern edge (approximately along the southern edge of unit 14). Between Paleoindian and Early Archaic occupations, the drop off along the southern edge of the dune was filled in with sand and was subsequently occupied by Early Archaic peoples. That appears to explain the discrepancies between the deeper cultural levels in

units 14 and 15, and the deeper levels in the rest of the block. This was an extremely important discovery.

The profiles from unit 8 (Figure 2-4) indicate strong Woodland disturbance all the way down through level 6, which was the deepest level completed in the unit. Although no Woodland ceramics were recovered from unit 15 (Figure 2-7), a large disturbed area covered approximately half of the unit and extended to the bottom of the excavation. It was located along the east wall. The Halifax-like point in level 6 was recovered from adjacent to the disturbance and probably was associated with it. The precise boundaries of the disturbance were difficult to identify. The western half of unit 15 produced a feature in level 8 near the south wall (Figure 2-7). Also, the northwestern corner contained harder sand and no evidence of disturbance in the lower levels. Level 7 also produced a noticeable increase in meta-volcanic debitage, Nottoway River cherts (probably Mitchell Plantation) including one modified piece, and one jasper flake and one orthoquartzite flake (Table 1-10).

Tables 1-1 through 1-3 do not show the quantities of quartzite and quartz debitage, and fire cracked rock for each unit, because of the problem with the levels. Any gross differences or vertical and horizontal trends in artifacts can be shown with the diagnostics and other raw materials.

Horizontally, Tables 1-2 and 1-3 show that units 2 and 3 had a distinct increase in chert/jasper and meta-volcanic debitage in levels 6 through 8. If those concentrations were at the intersections of the two units, then they would have been in the northeast corner of unit 2 and the southwest corner of unit 3 (the horizontal locations of the chert/jasper and meta-volcanic debitage were not recorded). If that were the case, then units 1 and 4 should have had similar peaks in those materials in those levels. However, Tables 1-1 and 1-4 show no such peaks. It is likely that the two peaks represented separate concentrations. The relative chronological analysis (Figures 2-1 and 2-2) indicates that these peaks were associated with the end of the Early Archaic and the beginning of the Middle Archaic period. A similar meta-volcanic peak in units 19 and 20 (discussed in the block C analysis below) occurred deeper but was chronologically connected to the Kirk horizon at the beginning of the Middle Archaic period.

The isolation of 15 slate artifacts in level 4 of unit 2 is a strong indicator of integrity (Table 1-2). All of the chert and jasper artifacts in unit 4 came from level 9 and below. It is estimated that level 9 in that unit was completely below the Morrow Mountain boundary (Figure 2-2). Most of the chert/jasper and the peak of the meta-volcanics occurred in level 5 and below in unit 14 (Table 1-9), which is almost entirely Early Archaic and Paleoindian (Figure 2-5).

Block B - Figure 10 shows the relative point chronology for this block. Tables 1-11 and 1-12 (Attachment 1) show the other, non-diagnostic artifacts from the block. The block produced only one Woodland artifact, an unidentified sand tempered potsherd from the plowzone. Considering the high number of sherds in blocks A and C, the low number of sherds in block B indicates an uneven horizontal distribution of Woodland activity. Although there was only one sherd, the block had the highest artifact intensity. Unit 16 produced a high number of Savannah River variant points in the top-most levels. These were associated with features B1 and B2. Halifax, Guilford, one Morrow Mountain 1, and numerous Morrow Mountain 2 points dominated the middle levels. Transitional Kirk Stemmed (Figure 11), and Bifurcate points helped to mark the Early-Middle Archaic boundary. Stanly points were not recovered from this unit.

Also absent were any probable Paleoindian diagnostics. The lower levels of unit 16, however, produced in increase in non-quartzite artifacts, including clear quartz. The earliest diagnostics were three large Palmer-like corner notched points (Figure 9). This is noteworthy because the horizontal area equaled only 100 square feet. Block A covered 850 square feet of completed units, and only two large Palmer-like corner notched points were recovered. The Early Archaic components were rounded out by Kirk Corner notched, Fort Nottoway, and Decatur. Small Palmer points were also missing.

The upper, northern end of the block (unit 16) produced the highest artifact concentration of any of the three blocks. Although there were no Paleoindian diagnostics to which to chronologically tie the exotic raw materials in the lower levels, it is likely that this area had as high a potential for Paleoindian occupation as did units 14 and 15 in block A. This area may also may be the best of the three blocks for an identifiable large Palmer-like corner notched occupation. Separating this occupation from the other Early Archaic occupations may be difficult since the Early Archaic diagnostics were vertically close together. Feature B8 (discussed below), against the east wall of unit 16, level 9 was below all of the

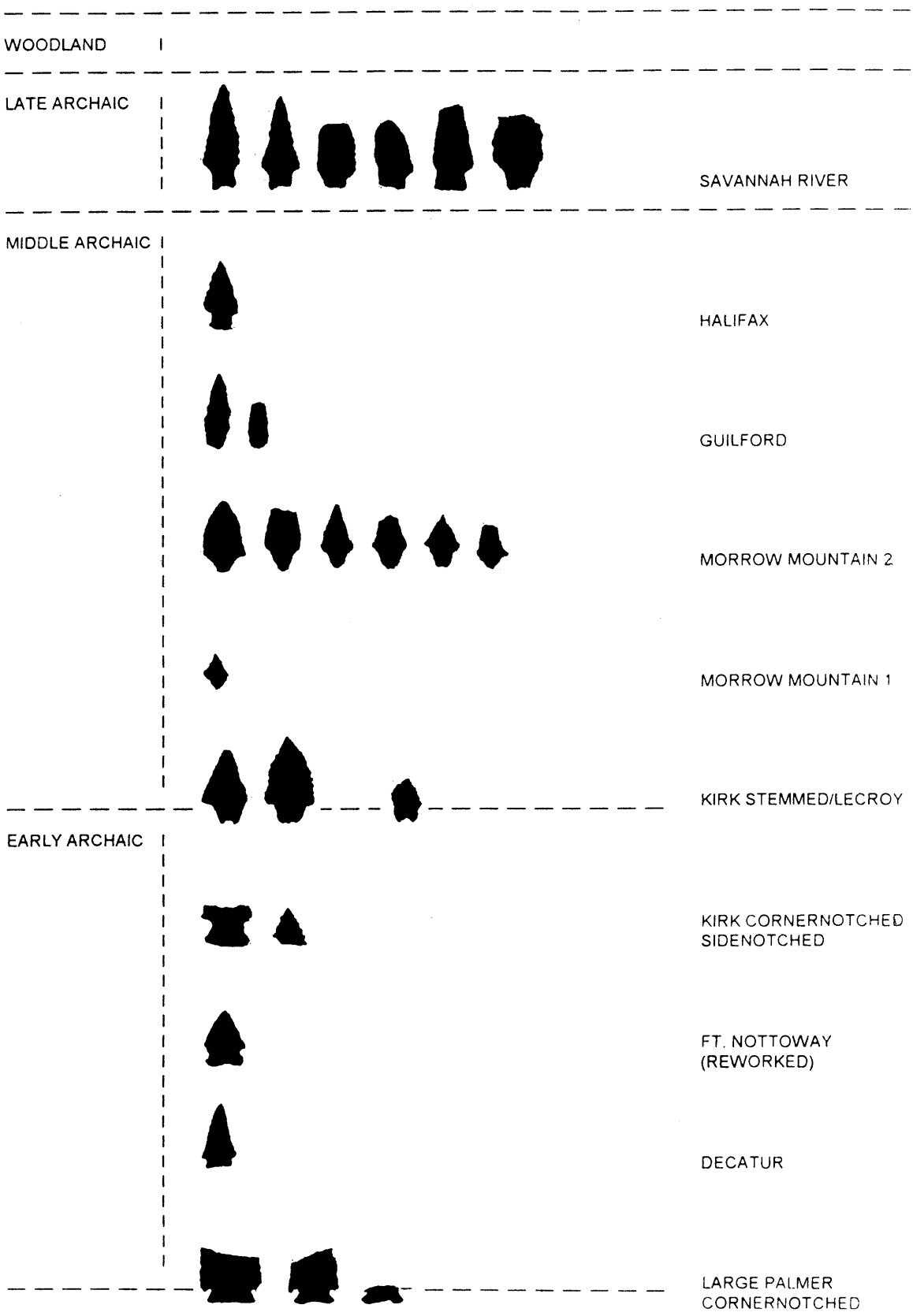

Figure 10. Relative vertical distribution of points from within Block B.

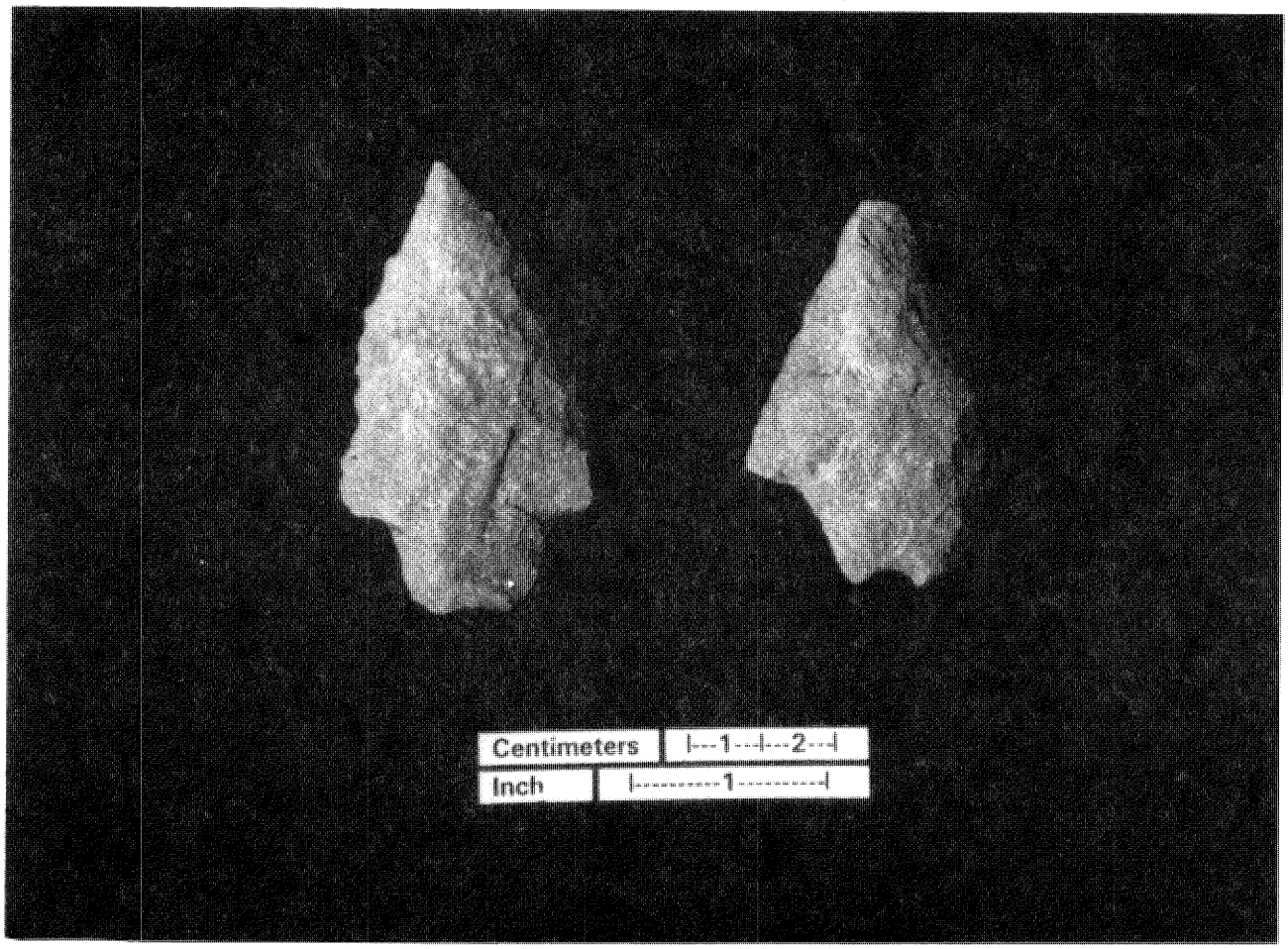

Figure 11. Examples of Kirk Stemmed points from Block B.

diagnostics, including the large Palmer-like corner notched points (Figure 2-8). Since all of the fire cracked rocks in the feature mended, the feature is indicative of an undisturbed early occupation.

Because block B was begun from the natural surface rather than one that had been disturbed (see block A above), the cultural slope appears to have corresponded to the arbitrary levels. Although no Woodland ceramics were recovered from below the plowzone, Figure 2-8 does show that there was some mixing of cultural material. A probable Kirk Stemmed point, along with several Savannah River and one Morrow Mountain point, were recovered from in and around feature B1 located in the northeast corner of level 1. At the southern end of unit 16 and the northern end of unit 17, a reworked Kirk Corner notched point and an unidentified side notched point occurred in features B5-1 and B5-2, which were above several Morrow Mountain points. About mid-way across unit 17, a Morrow Mountain point and a Guilford point were located at the same level as or below Kirk and Early Archaic artifacts. The termination line for the Morrow Mountain zone in Figure 2-8 reflects these anomalies, which may have resulted from prehistoric surface modifications such as mounding or digging holes.

An important factor to note is that no recognizable Morrow Mountain or later artifacts were recovered from below the Morrow Mountain termination line. The presence of mended fire cracked rock in feature B8 in levels 8 and 9 support the contention that the potential for isolating *in situ* features is high in the lower levels around this block.

In blocks B and C, where debitage and fire cracked rocks are shown in the tables (Attachment 1), it is noteworthy that most artifacts peaked in the Middle Archaic period (Tables 1-11 through 1-14). Yet, while quartzite and quartz debitage persisted in the deeper levels, fire cracked rocks largely disappeared (feature B8 being the notable exception). In block B the quartzite and quartz tools are most numerous in levels 5 through 7 which corresponded to the later part of the Early Archaic into the early Middle Archaic period. The chert/jasper and meta-volcanics also peaked there.

Block C - Although block B did produce a small quantity of wrought nails in the plowzone, block C was the only area containing evidence of historic occupation. It was manifested by wrought nails, white ball clay pipe stems and bowl fragments, many brick fragments, cottage ware (Colono), coarse redware, and unidentified stoneware. The block was close to a Colonial occupation observed in the exposed wall of one of the nearby looter holes.

Figure 12 contains the relative point chronology for this block. One Potts point and 59 sand tempered, cordmarked potsherds were recovered from the upper levels of the block, indicating a strong Woodland presence in the plowzone where most of the historic material was concentrated. The pottery penetrated to as deep as level 5 at the north end of unit 19 where a white ball clay pipe stem was recovered from level 10. The Middle Archaic assemblage included a possible Halifax point as well as Guilford, Morrow Mountain 2, and Stanly points. Here again, transitional Kirk Stemmed and Bifurcate points helped to mark the Early-Middle Archaic boundary.

Paleoindian and Early Archaic diagnostics were noticeably absent. A large, well made lanceolate biface base (Figure 13) was recovered from level 11 of unit 20. However, a St. Albans-like Bifurcate point was recovered from level 10 of the same unit and another Bifurcate point was recovered from level 10 of unit 19. As a result, the biface probably is a Ft. Nottoway point preform, making it the only potential Early Archaic diagnostic artifact in the block. Level 8 in both units produced four features and three points: a Kirk Stemmed (Figure 14), a Kirk Serrated (possibly a heavily reworked Kirk Corner notched) (Figure 15), and a Stanly (Figure 16). The Stanly point was in a fire cracked rock and debitage feature (C4) at the top of the level in the southern end of unit 19, The Kirk Serrated point was made of meta-volcanic rock identical to the material in a large chipping feature (Feature C5) in the same level (8) of unit 19. Another fire cracked rock and debitage feature (C6) along the west wall of unit 20 was two feet away from the Kirk Stemmed point.

This block was also excavated from the natural surface, with the arbitrary levels corresponding to the bottom of the plowzone. The natural slope was greater than in block B, because the area chosen for excavation was further from the top of the dune. The orientation of the unit along the tree rows appears to have made the long axis of the trench more perpendicular to the natural slope than in block B. Figure 2-9 shows a possible two-inch difference in the arbitrary slope and cultural slope as indicated by the hypothesized termination of the Morrow Mountain zone. The bottom of the Morrow Mountain zone was more difficult to determine in block C because there

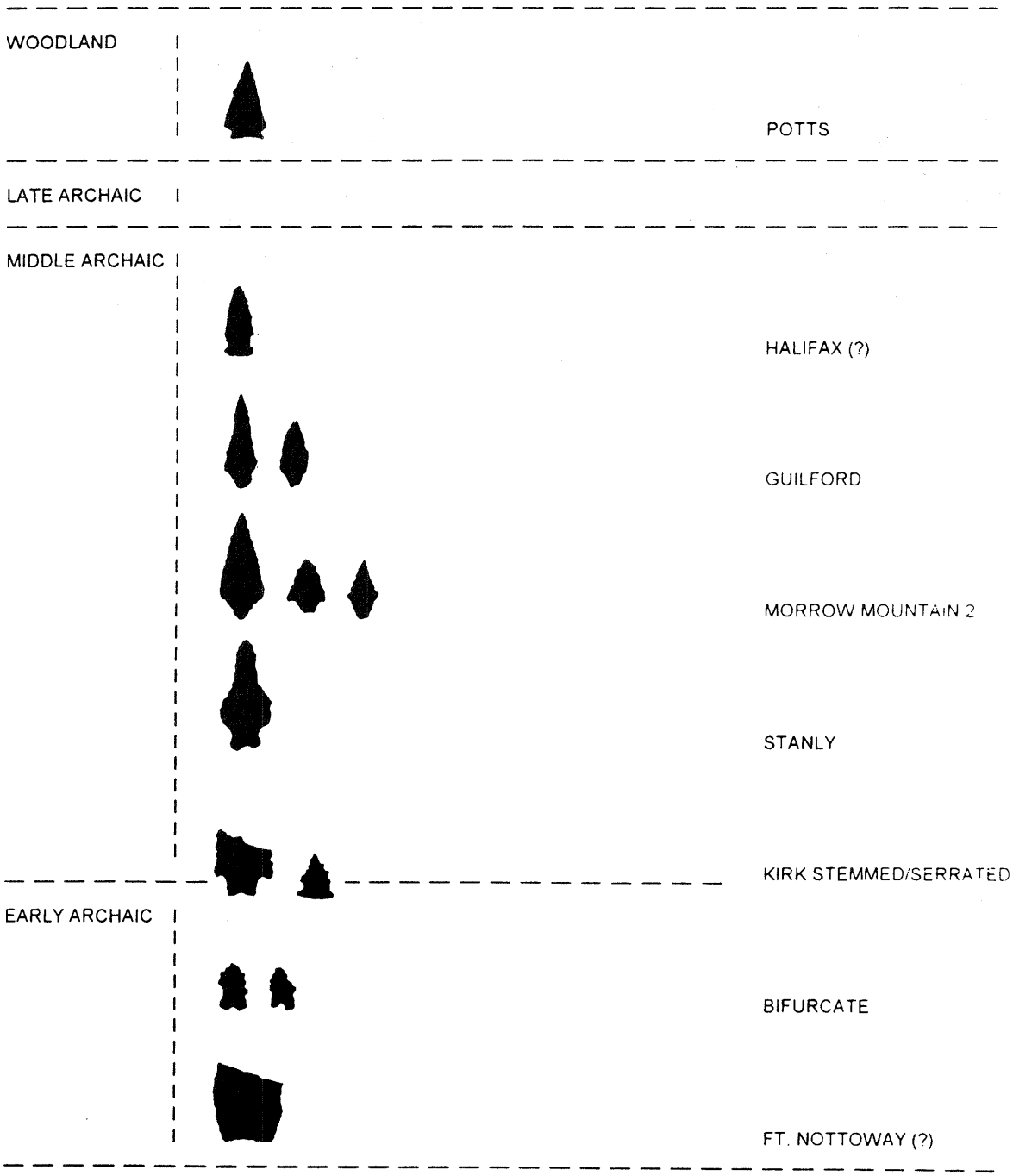

Figure 12. Relative vertical distribution of points from within Block C.

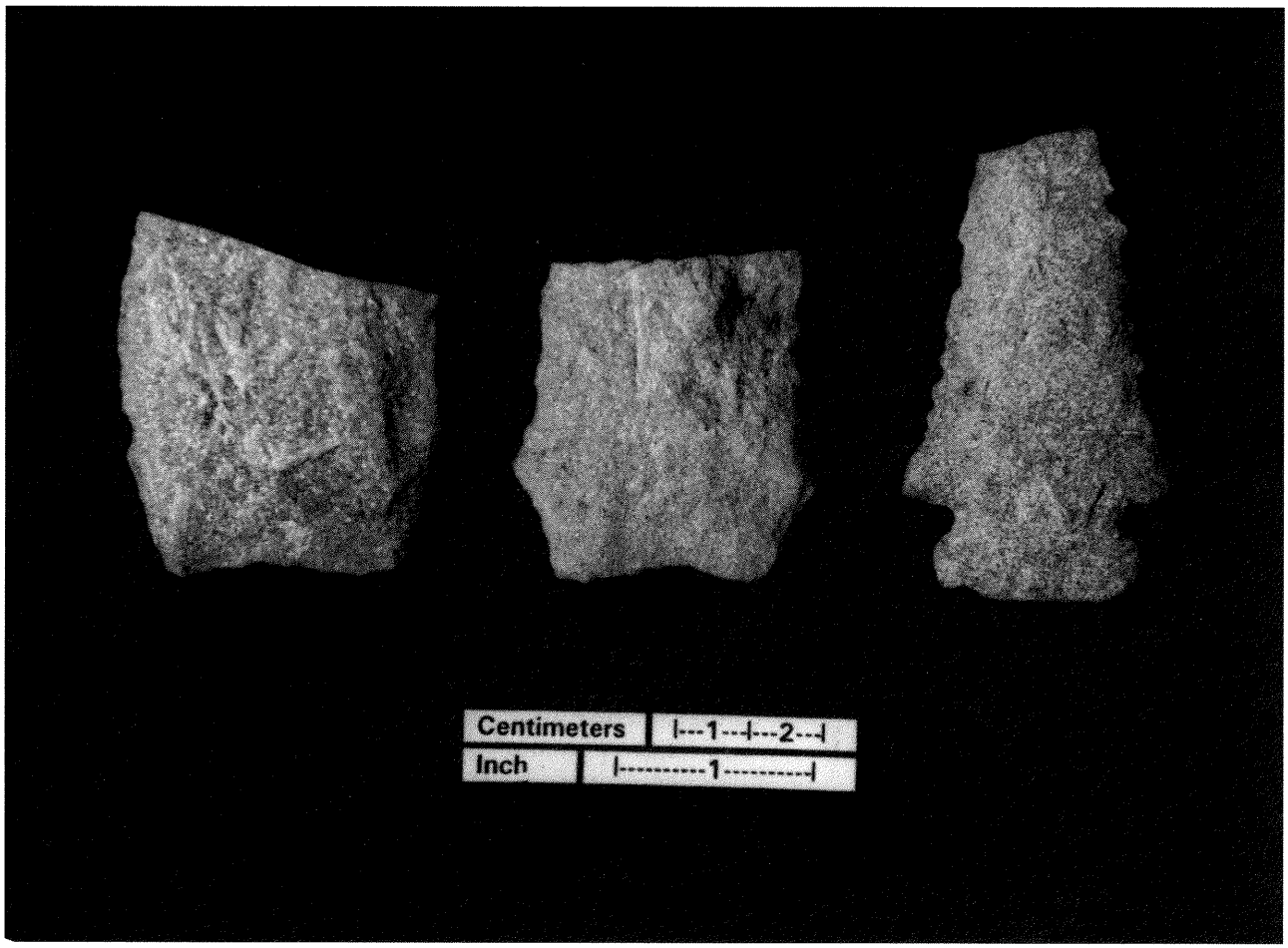

Figure 13. Fluted lanceolate biface base, probably a broken Fort Nottoway preform, from Unit 20, Level 11 (left), and later stage Fort Nottoway preform (center) and Fort Nottoway point from Block A (1993).

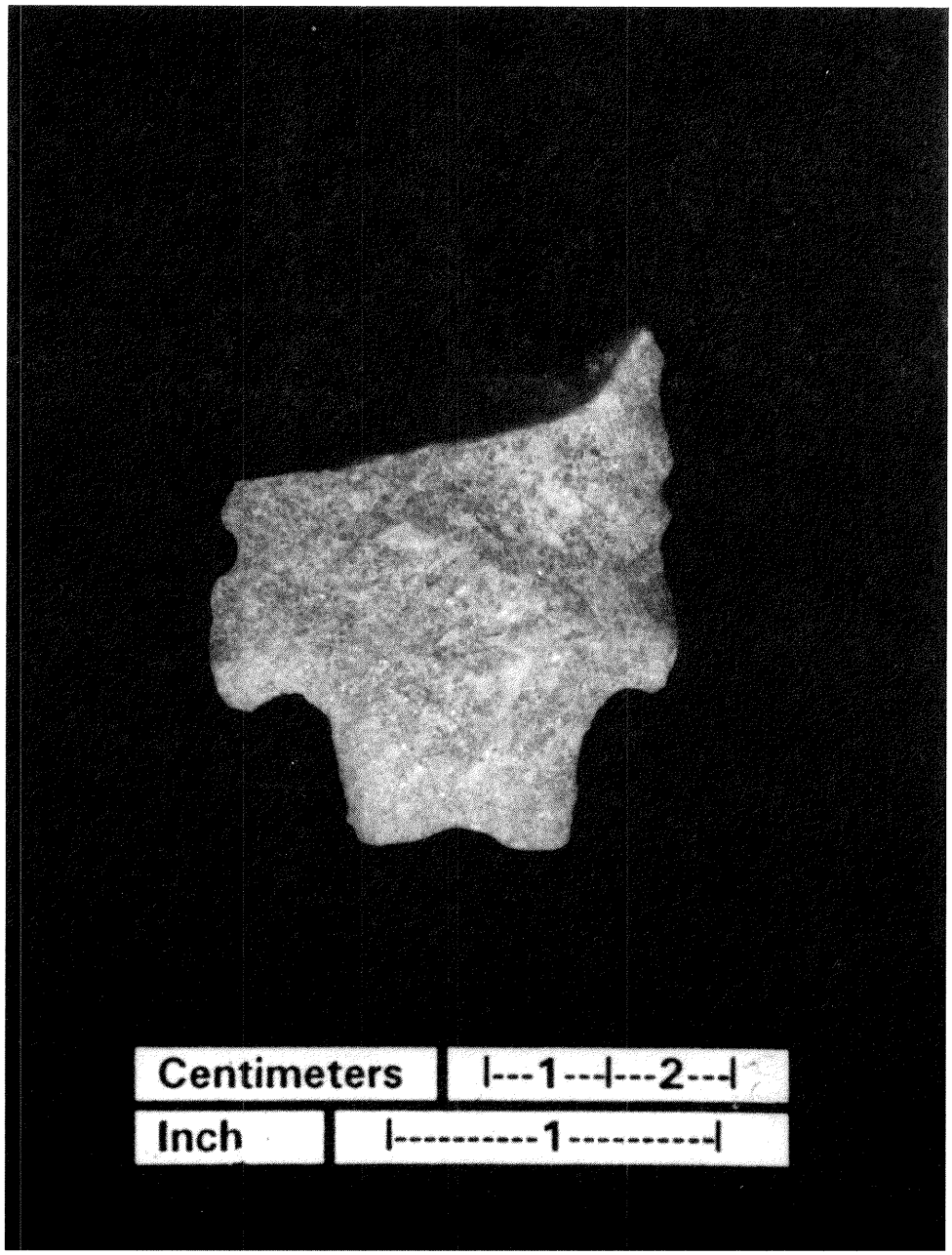

Figure 14. Kirk stemmed point from Unit 20, Level 8.

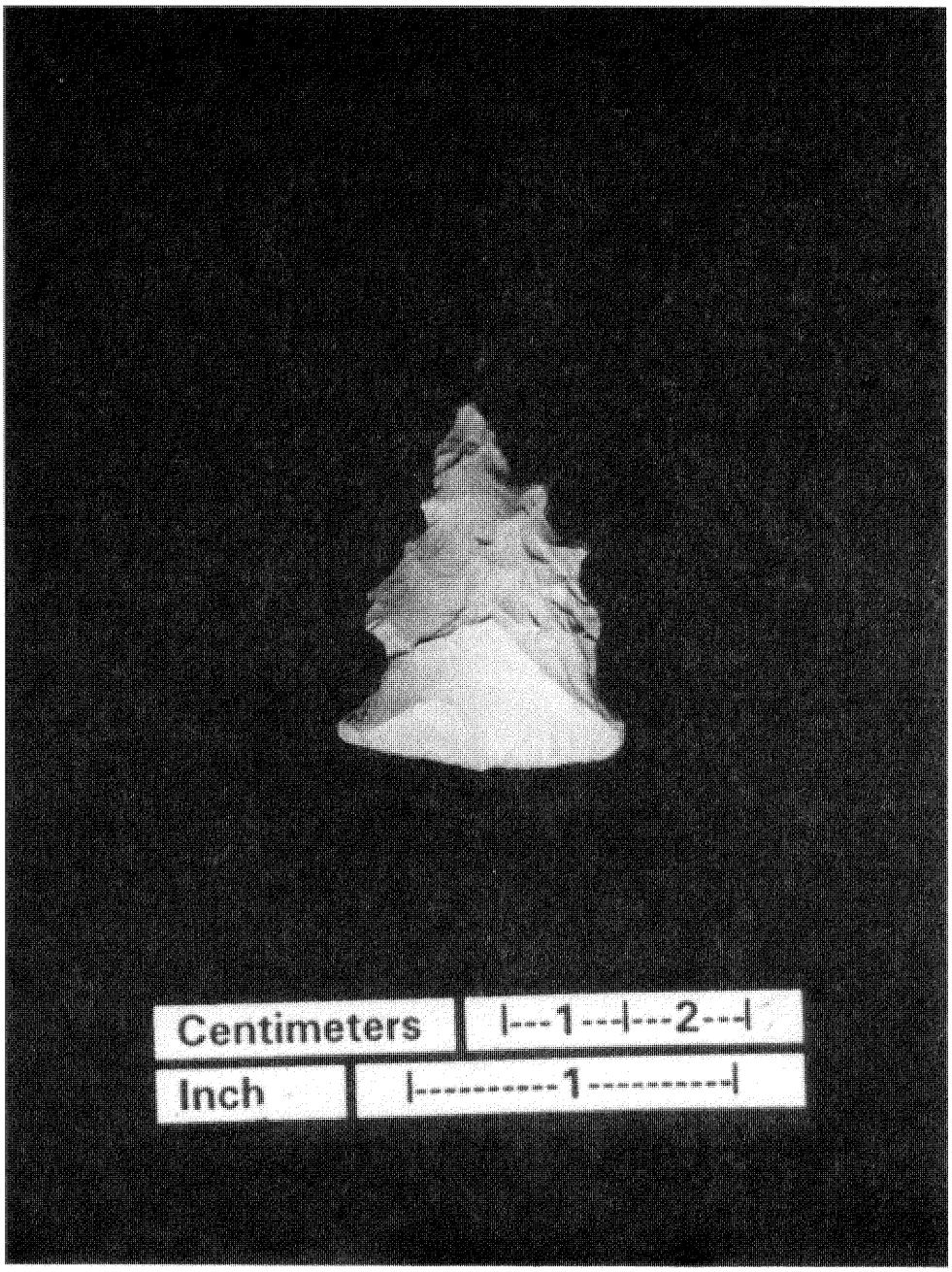

Figure 15. Kirk serrated (reworked side notched point?) From Unit 19, Level 8.

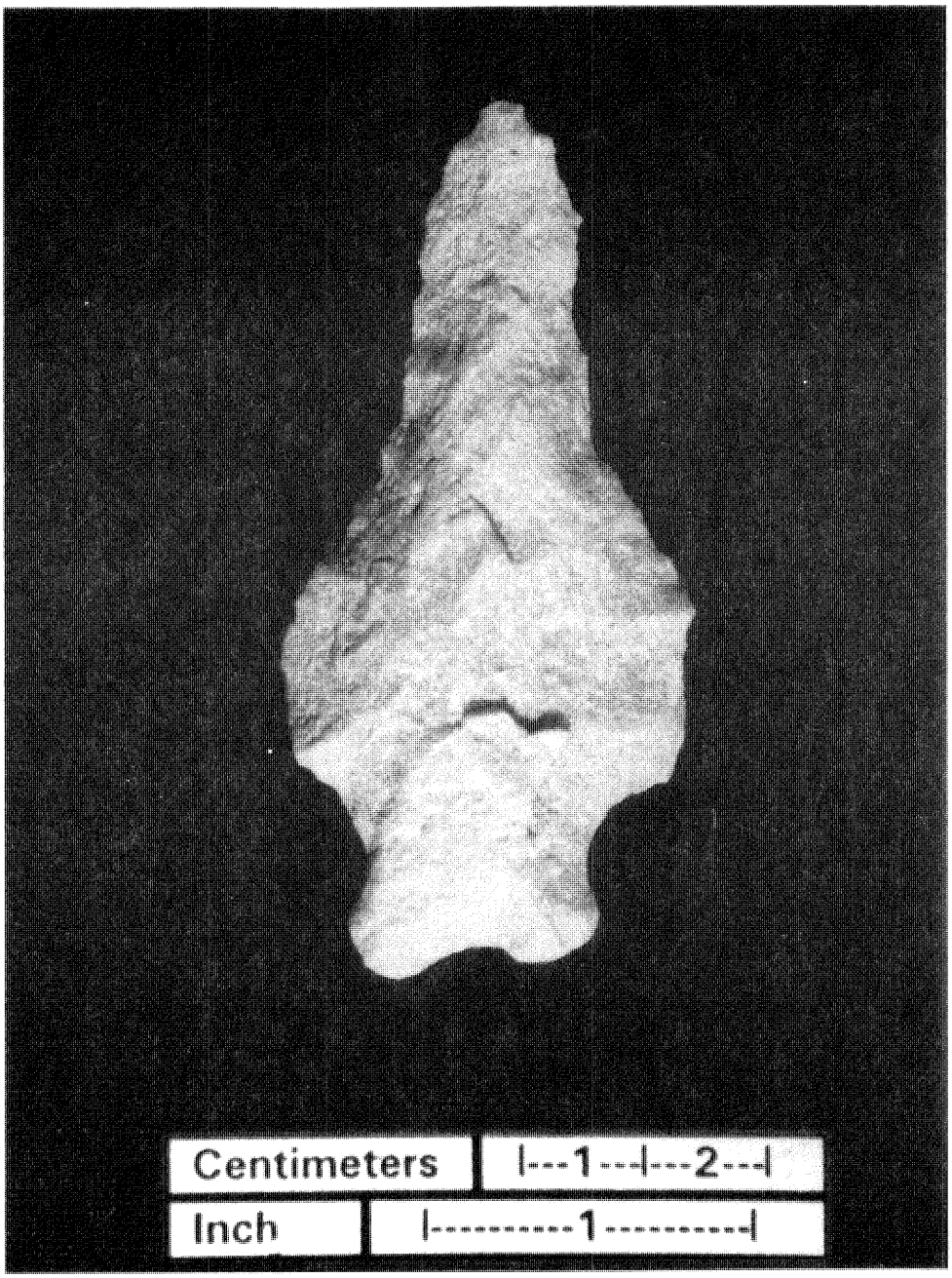

Figure 16. Stanly-like point from Unit 19, Level 8, Feature C4.

were fewer diagnostics present (Figure 2-9). The boundary was also complicated by the presence of several Early to Middle Archaic features that were vertically close together. These included one feature containing a Stanly-like point, one containing a reworked Kirk Serrated, and one within a foot of a Kirk Stemmed point. These features will be discussed in more detail below.

The lower levels appeared to contain only later Early Archaic components. Bifurcate points and probable Fort Nottoway biface fragments were the only diagnostics below the Kirk and Stanly-like points. A charcoal concentration, containing mostly wood charcoal, was recovered from around and below the large lanceolate biface base in level 11 of unit 20. Dates are pending. Several items of exotic chert from the same core were recovered from levels 11 through 13 in unit 19.

The northwest corner (approximately a 2x2-foot block of the corner) of unit 19 appeared to be disturbed. A 6 to 8-inch diameter stain extended through the levels to the bottom. It was initially thought to be a tree stain but the recovery of the white ball clay pipe stem in level 10 near the stain indicates that the stain may have been indicative of greater disturbance.

As stated above, quartzite and quartz fire cracked rock started to disappear at about the Early-Middle Archaic boundary (Attachment 1, Tables 1-13 and 1-14). A distinct peak in green patinated meta-volcanic debitage occurred in levels 7 through 10 in unit 19 (Table 1-13) and levels 6 through 9 in unit 20 (Table 1-14). The one level difference between units 19 and 20 probably corresponds to the two-inch difference shown in the northern and southern ends of the Morrow Mountain boundary. As a result, the meta-volcanics were probably from the same time period (Kirk). The vertical extent should have been due to the normal downward drift in debitage.

Features - Block A produced 12 recognizable features, and blocks B and C produced eight each. The features included various combinations of the following: small clusters of fire cracked rocks, apparent living floors, recognizable chipping areas, charcoal concentrations. The profiles of each unit show the location of each feature within its respective unit profile (Attachment 2). Note that because the horizontal scale is compressed, the vertical size of each feature is exaggerated.

Feature A1 (Figure 17) began in unit 9, level 4 and extended into level 9 (Figure 2-5). Because of difficulty recognizing the feature, all of the rocks from above level 9 were merged with level artifacts. Two artifacts from level 8 and two from level 7 were from the feature area. These were the only items that could be culled from the level bulk. Four mapped items came from level 9 of the feature and were debitage and modified or worn lithics. The two items from level 7 were a piece of debitage and a pitted cobble. Other mapped items included a quartz biface tip and a quartzite core. They indicate that the feature may not have been a hearth or sweat lodge, although fire cracked rocks were included in the material merged with the level artifacts. The Halifax point recovered from the same level as the top of the feature indicates that feature 1 may have been a Halifax feature. Sand samples were recovered.

Feature A2 (Figure 18) consisted of hardened sand with a dark brown mineral concretion in the center. It was located in unit 9, level 10 (Figure 2-5). Mixed with the sand were one small quartzite fire cracked rock, two quartzite debitage, three quartzite debitage with cortex, one large thermally altered quartzite modified/worn lithic (possibly an abrader), and two quartz debitage with cortex. The feature probably was either Early-Middle or Early Archaic, because of its depth. It is difficult to place the feature chronologically with any precision because the cultural slope was greater toward the south than the slope of the arbitrary level used in the excavation. The entire feature was recovered.

Feature A3 (Figure 19) consisted of slightly hardened sand with blackish mineral concretions along the west wall of unit 2, level 9 (Figure 2-1). Artifacts included four quartzite fire cracked rocks with cobble cortex (two of which mended), one quartz modified/worn lithic with cortex, one fluted quartzite biface, and one quartzite debitage with a polished edge. The fire cracked rocks included pieces ranging from 40 to 588 grams in weight, indicating a low potential for significant movement after deposition. The mended pieces also support this contention. The feature probably represents a hearth or sweat lodge at the center of some kind of activity area. The presence of the fluted biface puts the feature securely in the Early Archaic period. A Kirk Stemmed point was recovered from the west wall, 5 ½ feet north in level 7. A Morrow Mountain point also was recovered slightly to the south and east of the feature in level 8. This is consistent with the higher cultural slope to the south. Charcoal was present in the feature and was recovered, as was the sand under each rock.

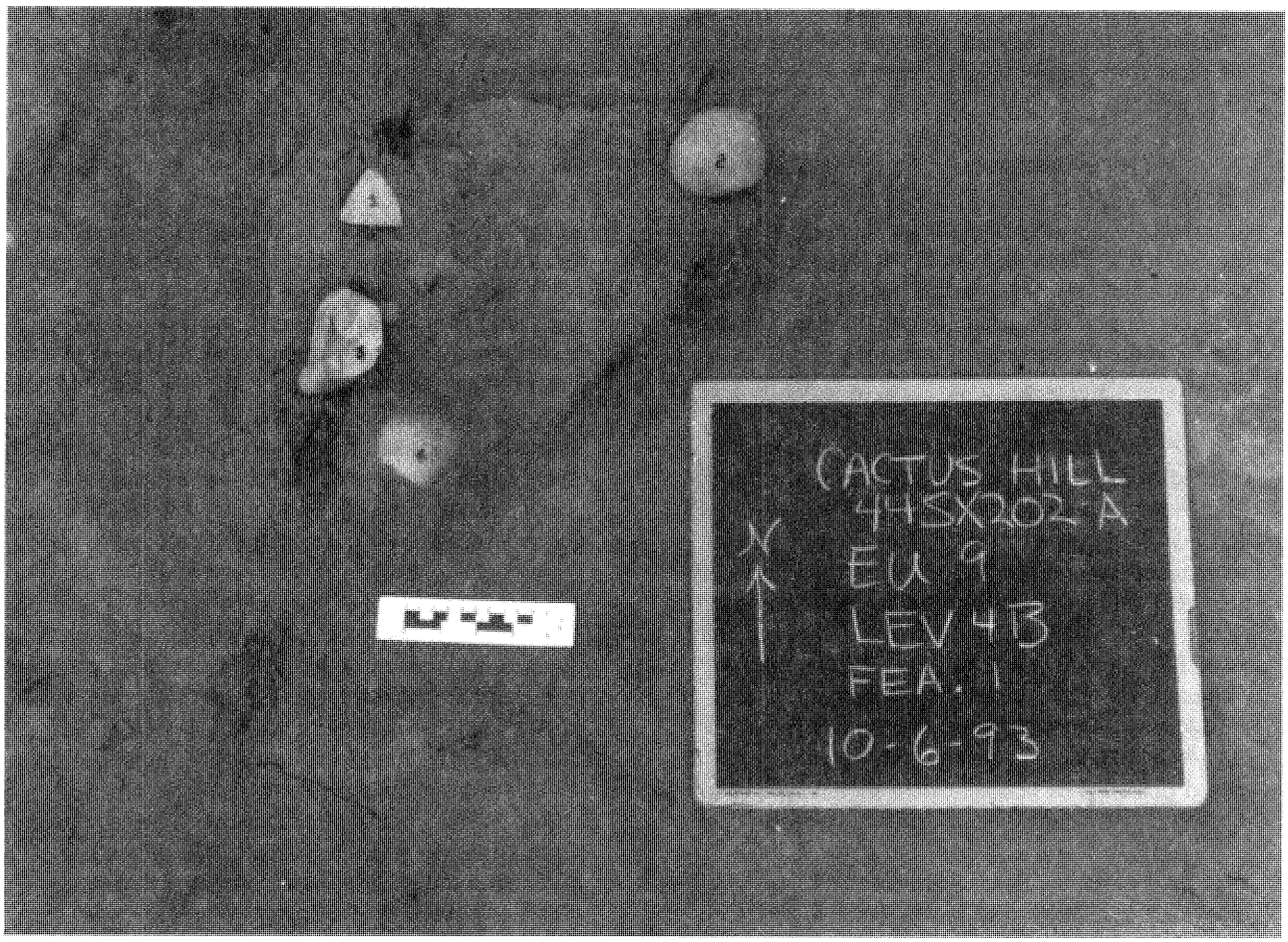

Figure 17. Feature A1.

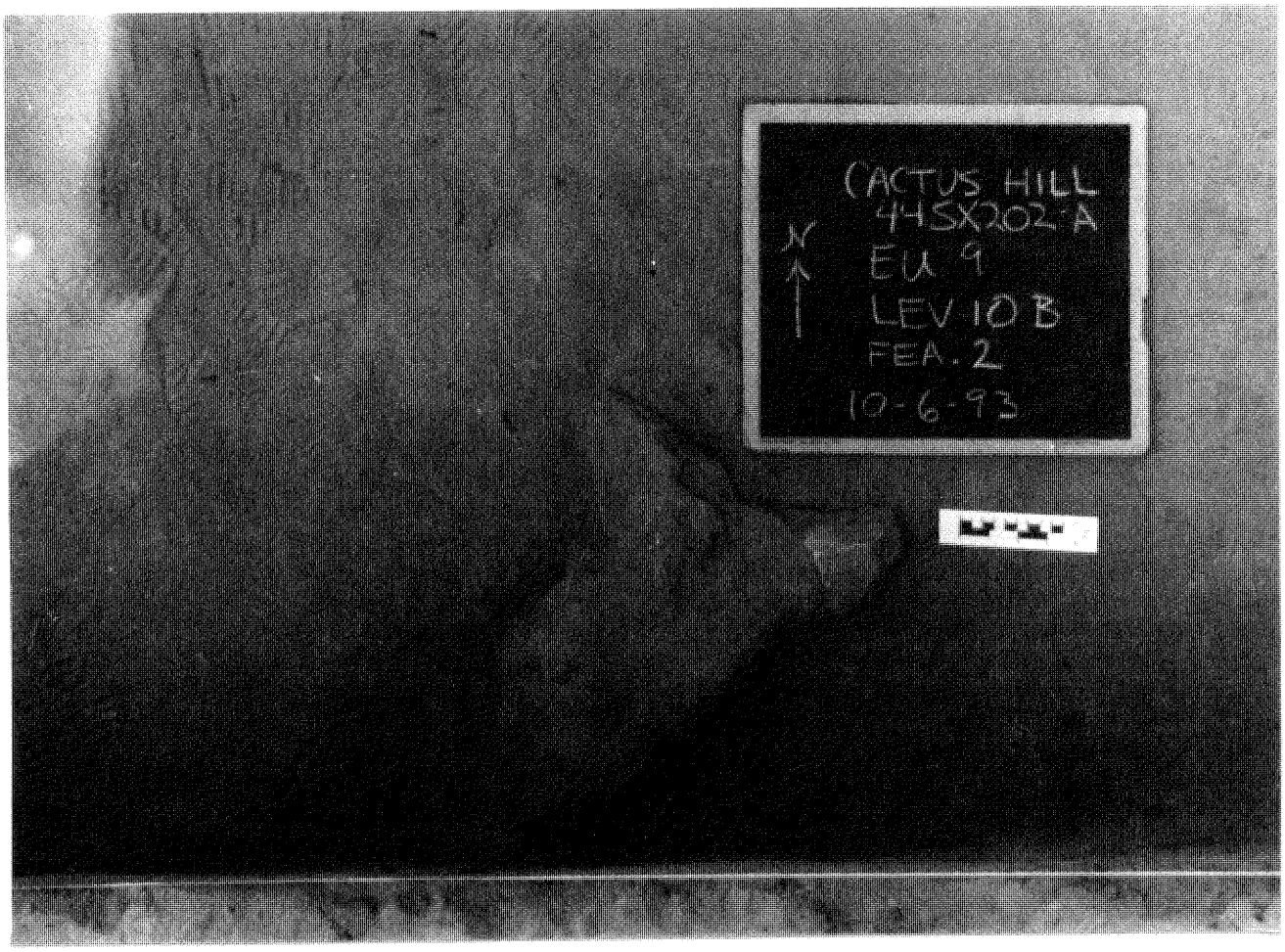

Figure 18. Feature A2.

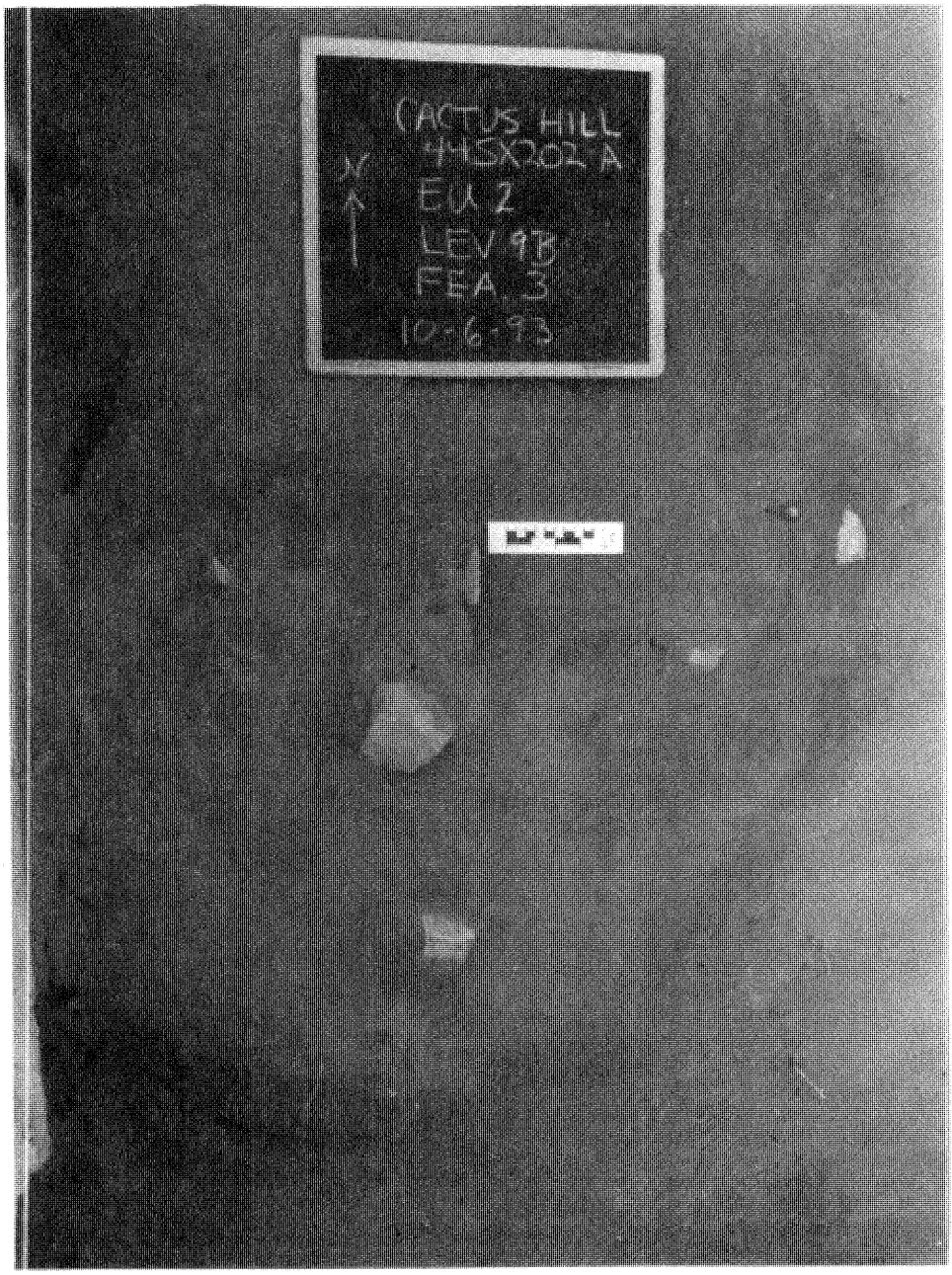

Figure 19. Feature A3.

Feature A4 (Figure 20) consisted of an area of hardened sand, a piece of quartzite fire cracked rock, one burned quartzite modified/worn lithic, and one quartzite debitage in unit 2, level 9 (Figure 2-1). The fire cracked rocks weighed 349.2 grams, and the quartzite modified/worn lithic weighed 101.5 grams. Charcoal was observed under the fire cracked rocks and nowhere else. The pedestals were recovered. The feature appears to have been located a little above feature A3. Taking into account the cultural slope, feature A4 could be either early Middle Archaic or late Early Archaic.

Feature A5 (Figure 21) consisted of a related scatter of seven quartzite and two quartz modified/worn lithics in unit 3, level 7 (Figure 2-2). One small quartzite fire cracked rock was also present. This was a significant feature in that its profile clearly demonstrated how the cultural slope was greater toward the south than the slope of the arbitrary levels. The feature appeared to have a cluster of tools in the center. It was vertically consistent with the Morrow Mountain 2 point finds in this unit and unit 4.

Feature A6 (Figure 22) consisted of an area of hardened sand containing numerous artifacts in unit 3, level 7 (Figure 2-2). The artifacts included six quartzite fire cracked rocks, one quartz fire cracked rock, eleven quartzite debitage, one quartzite pitted cobble, five quartzite modified/worn lithics, one quartzite biface, two quartz modified/worn lithics, two quartz bipolar split cobbles, and one large quartz biface tip. It is possible that it was a combination hearth or sweat lodge and activities area. The feature was in the same level and square as feature A5 and only about one foot to the south. It was likely another Morrow Mountain feature.

Feature A7 consisted of a one-foot diameter cluster of fire cracked rocks in unit 14, level 1 (Figure 2-5). Artifacts included four quartzite fire cracked rocks weighing 803.3 grams, and one quartz fire cracked rock weighing 47.7 grams. One charcoal sample was recovered. Considering the large size of the fire cracked rocks, it is likely that they had not moved much since deposition. Also considering the fact that the level produced pottery, a Savannah River point and a Morrow Mountain point, it is not clear how old it is.

Feature A8 (Figure 23) consisted of a small diameter cluster of fire cracked rocks and stone tools in unit 14, level 4 (Figure 2-5). Artifacts included two pieces of mended quartzite fire cracked rocks, two other mended quartzite fire cracked rocks, five quartzite debitage, one quartzite pitted cobble, and one quartz modified/worn lithic. The presence of mended fire cracked rocks strongly suggest an *in situ* deposit. The presence of tools and flakes with the small fire cracked rock concentration makes chronological placement and the analysis of the feature's function difficult. A charcoal sample was recovered which may eventually help. This feature probably dates to the early part of the Middle Archaic or later part of the Early Archaic period.

Feature A9 (Figure 24) consisted of a large scatter of fire cracked rocks, debitage, and tools in association with a Guilford point in unit 12, level 3 (Figure 2-6). Twenty-six quartzite fire cracked rocks (including two mends), six quartzite debitage, nine quartzite modified/worn lithics, four quartzite biface fragments, one quartzite Guilford point, two quartz fire cracked rocks, two quartz debitage, two quartz modified/worn lithics, one quartz uniface, and two unidentified quartzite pebbles were mapped. The feature appeared to have been a living floor. No comparable concentration of artifacts was recovered from the levels above. The feature also appeared to be deeper to the south which conformed to the cultural stratigraphy. The Guilford point indicates a cultural association. Regretfully, lack of time and the higher priority of units 14 and 15 meant that this half unit was not dug below this feature.

Feature A10 (Figure 25) consisted of a tight cluster of tools and debitage partially contained in unit 15, level 8 (Figure 2-7). Artifacts included five quartzite debitage, one quartzite modified/worn lithic, one quartzite pitted cobble, two quartzite unifaces, one quartz pitted cobble, and two quartz modified/worn lithics. A charcoal sample was recovered. Clear quartz was recovered from among the quartz tools. Level 8 is comparable to level 8 in unit 14, less than one foot to the west, which was two levels below the Hardaway side notched point in unit 14, level 6 (Figure 2-5). This feature may have been late Paleoindian or, because it was on the boundary of the truncated Paleoindian dune, it may have been Early Archaic. Note the absence of fire cracked rocks.

Feature A11 consisted of a noticeable concentration of mostly quartzite modified/worn lithics with some debitage and fire cracked rocks in unit 13, level 4 (Figure 2-6). Artifacts included three quartzite fire cracked rocks, three quartzite debitage, seven quartzite modified/worn lithics, one quartzite uniface, four quartzite biface fragments, and one

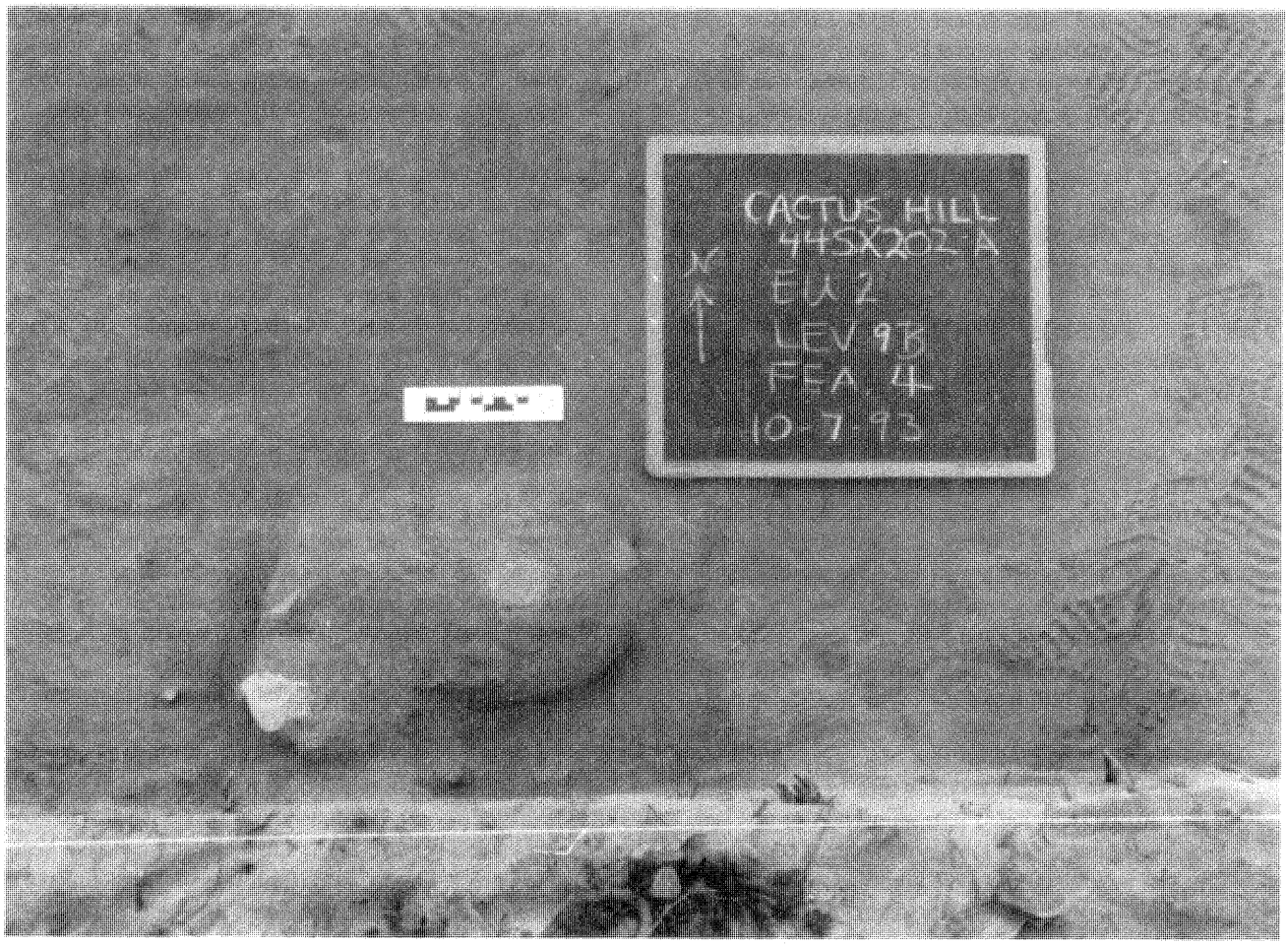

Figure 20. Feature A4.

Figure 21. Feature A5.

Figure 22. Feature A6.

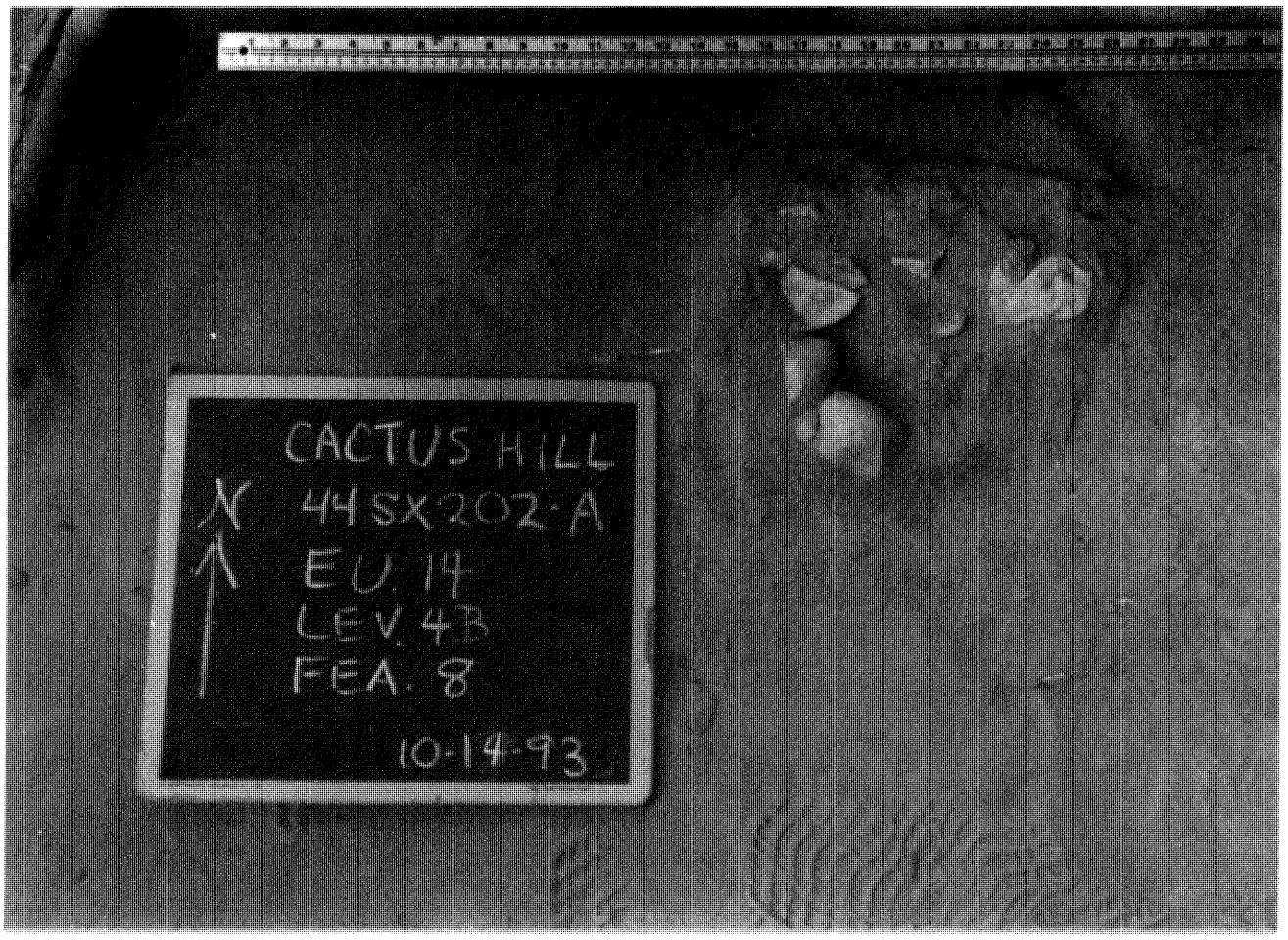

Figure 23. Feature A8.

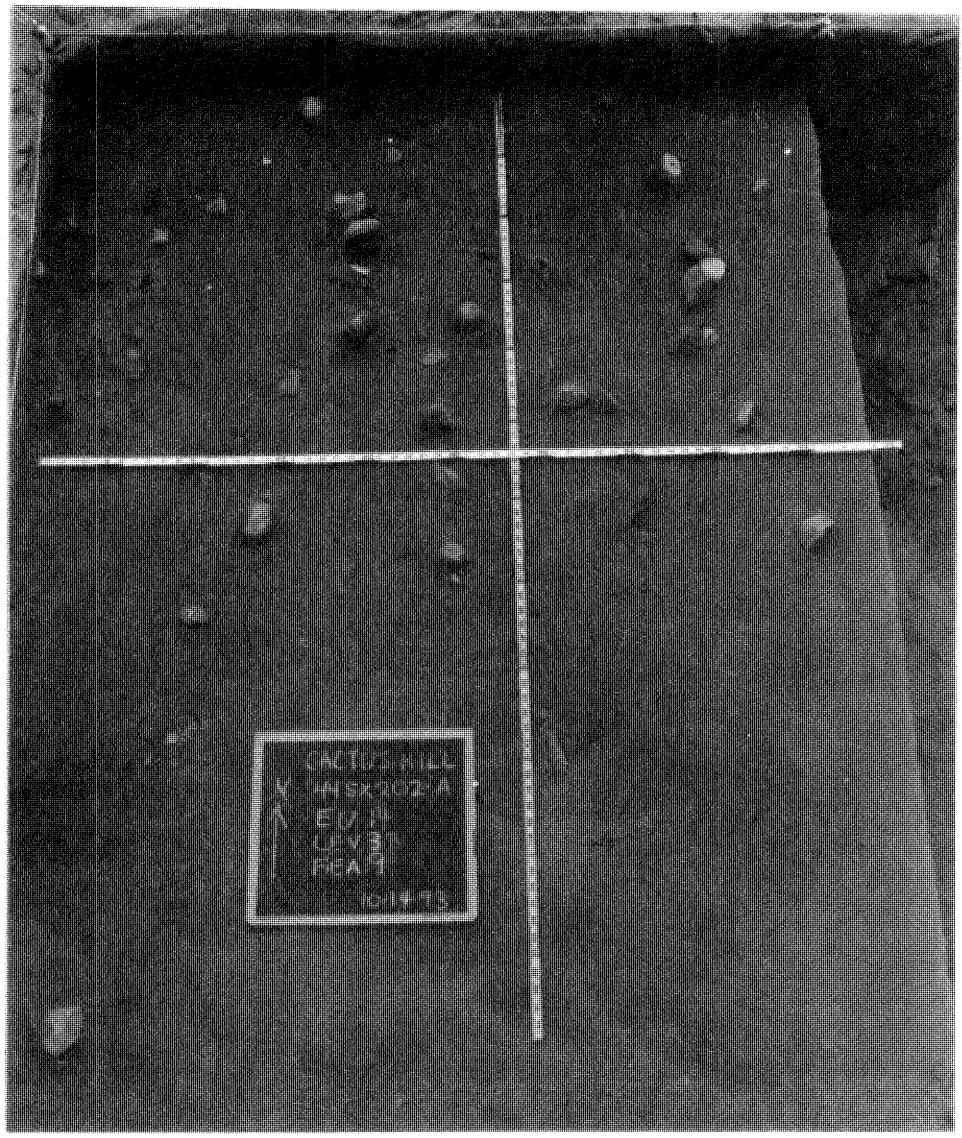

Figure 24. Feature A9. Note that the Unit number on the chalk board should read "E.U. 12."

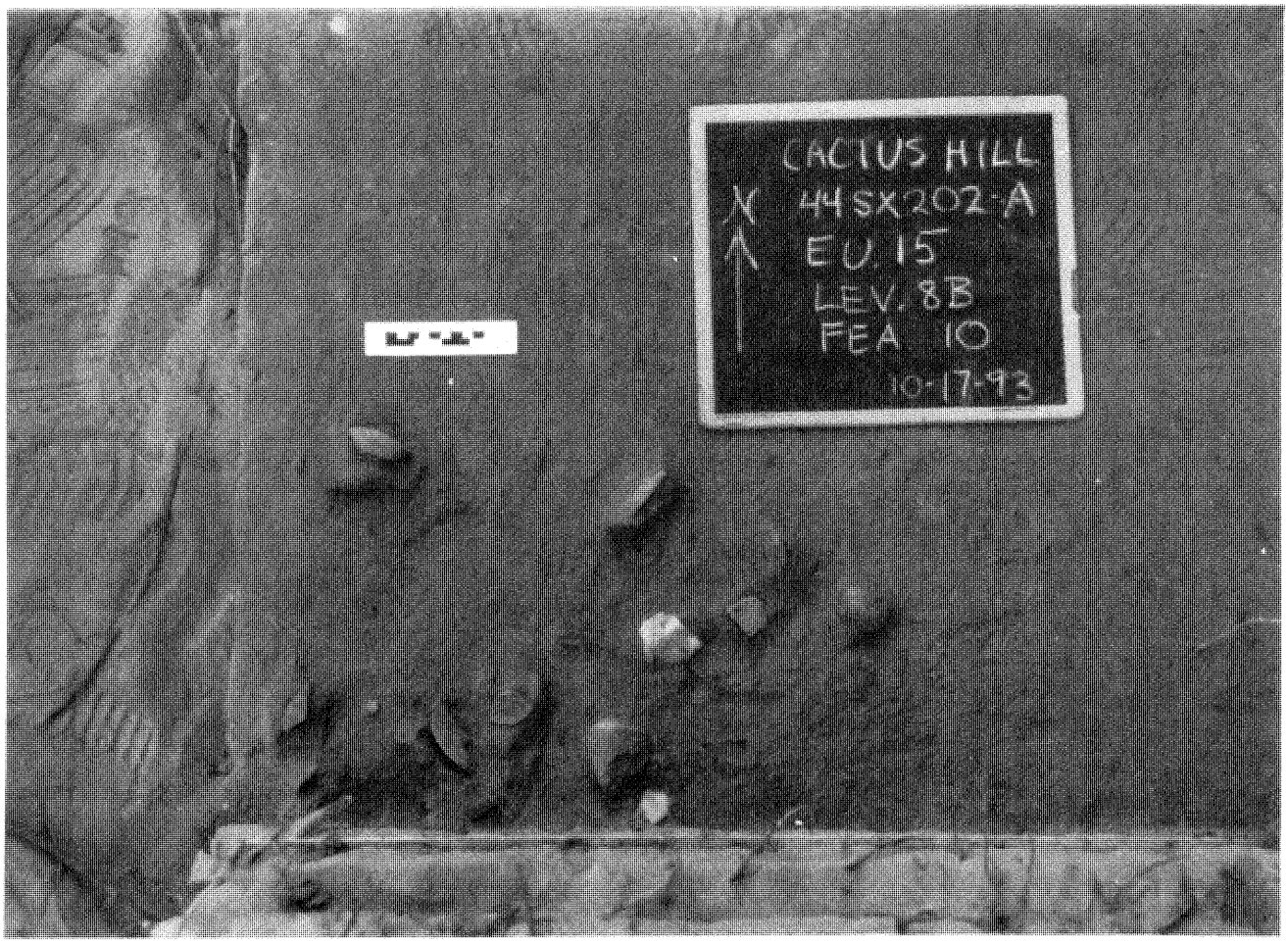

Figure 25. Feature A10.

quartz modified/worn lithic. The actual cultural slope of the feature is not known because individual artifact depths were not recorded. A Morrow Mountain 2 point was recovered from level 5 of the same unit. This feature is either another Guilford living floor like feature A9 or a Morrow Mountain 2 feature. Because of the cultural slope the feature seems to line up with the Guilford feature (A9).

Feature A12 was a tight cluster of fire cracked rocks and tools containing numerous mends in Unit 13, Level 4 (Figure 2-6). Artifacts included six quartzite fire cracked rocks (including one mend), one quartzite debitage, and five quartzite modified/worn lithics. It is noteworthy that the two mended pieces of fire cracked rock mended to two modified/worn lithics which also were thermally altered. Additionally, one of the pieces of debitage mended to one of the modified/worn mends. In all, five artifacts mended across three artifact types. The feature was in the same level as Feature A11 but a little higher. Because it was up-slope of A11, Feature A12 probably is also Guilford.

Feature B1 (Figure 26) consisted of a large concentration of fire cracked rocks, debitage, modified/worn lithics, and stemmed points in unit 16, levels 1 and 2 (Figure 2-8). A total of 118 artifacts were recovered. They included 16 quartzite fire cracked rocks, 74 quartzite debitage, two quartzite modified/worn lithics, two quartzite Savannah River points, one possible Kirk Stemmed point, one bipolar quartzite debitage, three quartz fire cracked rocks, five quartz debitage, two quartz modified/worn lithics, one pitted quartz cobble, one bipolar quartz debitage, one unidentified chert debitage, 13 unidentified fire cracked rocks, and six cobbles and pebbles. Although one of the stemmed points appeared to be a Kirk, the feature appears to be Savannah River or later, because it started at the base of the plowzone. It is also not totally clear that feature B3 (discussed below) is not part of feature B1 because it is directly under B1 with only about an inch or two separation. Without any visible soil color or texture differences, the separation may not have been archeologically significant.

Feature B2 consisted of a concentration of eight quartzite fire cracked rocks, 52 quartzite debitage, two quartzite modified/worn lithics, one quartzite biface, one quartzite Savannah-like point, four quartz fire cracked rocks, one meta-volcanic debitage, and six unidentified fire cracked rocks in unit 16, level 1 extending into the northeast corner of unit 17, level 1 (Figure 2-8). A charcoal sample was recovered. The feature was more dispersed than feature B1. Considering that the arbitrary levels in this block more closely matched the cultural levels, it is likely that this feature is Savannah River or later.

Feature B3 (Figure 27) consisted of a tight concentration of artifacts directly under feature B1. It was located in unit 16, level 3 (Figure 2-8). Artifacts included 14 quartzite fire cracked rocks, 36 quartzite debitage, three quartzite biface fragments, 17 quartz fire cracked rocks, eight quartz debitage, three quartz modified/worn lithics, one unidentified fire cracked rocks, one unidentified piece of granite, and two pebbles. Considering that the feature was directly under (only about an inch below) and similar in composition to feature B1, it is possible that it was a part of B1. The mixture of point styles around and in features B1 and B3 indicated that the area was disturbed, probably by a pit. Features B1 and B3 may have been separate depositions within the same pit feature. If that is the case, then feature B3 would also be Savannah River or later.

Feature B4 (Figure 28) consisted of a concentration of fire cracked rocks, debitage, and tools located to the west and below feature B3 in unit 16, level 5 (Figure 2-8). It contained three quartzite fire cracked rocks, two quartzite debitage, three quartzite modified/worn lithics, three quartz fire cracked rocks, two mended pitted quartz cobbles, and one unidentified pebble. The fire cracked rocks weighed almost 700 grams, indicating that they probably were *in situ*. The mended quartz artifacts support the probability that feature B4 was relatively undisturbed. It was lighter in concentration than features B1 and B3. Its location in level 5 indicates that it is of Morrow Mountain age.

Feature B5 (Figures 29 and 30) consisted of what was eventually determined to be two tight clusters of artifacts. Feature B5-1 was in the southwest corner of unit 16 at the top of level 5 and feature B5-2 was in the northwest corner of unit 17 at the bottom of level 4 (Figure 2-8). Artifacts included 14 quartzite fire cracked rocks, 42 quartzite debitage, two quartzite modified/worn lithics, three quartzite unifaces, one quartzite Kirk Corner notched point (reworked), one unidentified quartzite Morrow Mountain point, one quartzite side notched (lobed base) point, five quartz fire cracked rocks, two quartz debitage, one quartz modified/worn lithic, one meta-volcanic debitage, two unidentified fire cracked rocks, and six pebbles. A charcoal sample was recovered. The feature probably represents at least two separate activities that date to the Middle-Early Archaic boundary. It is not clear whether the lobate based

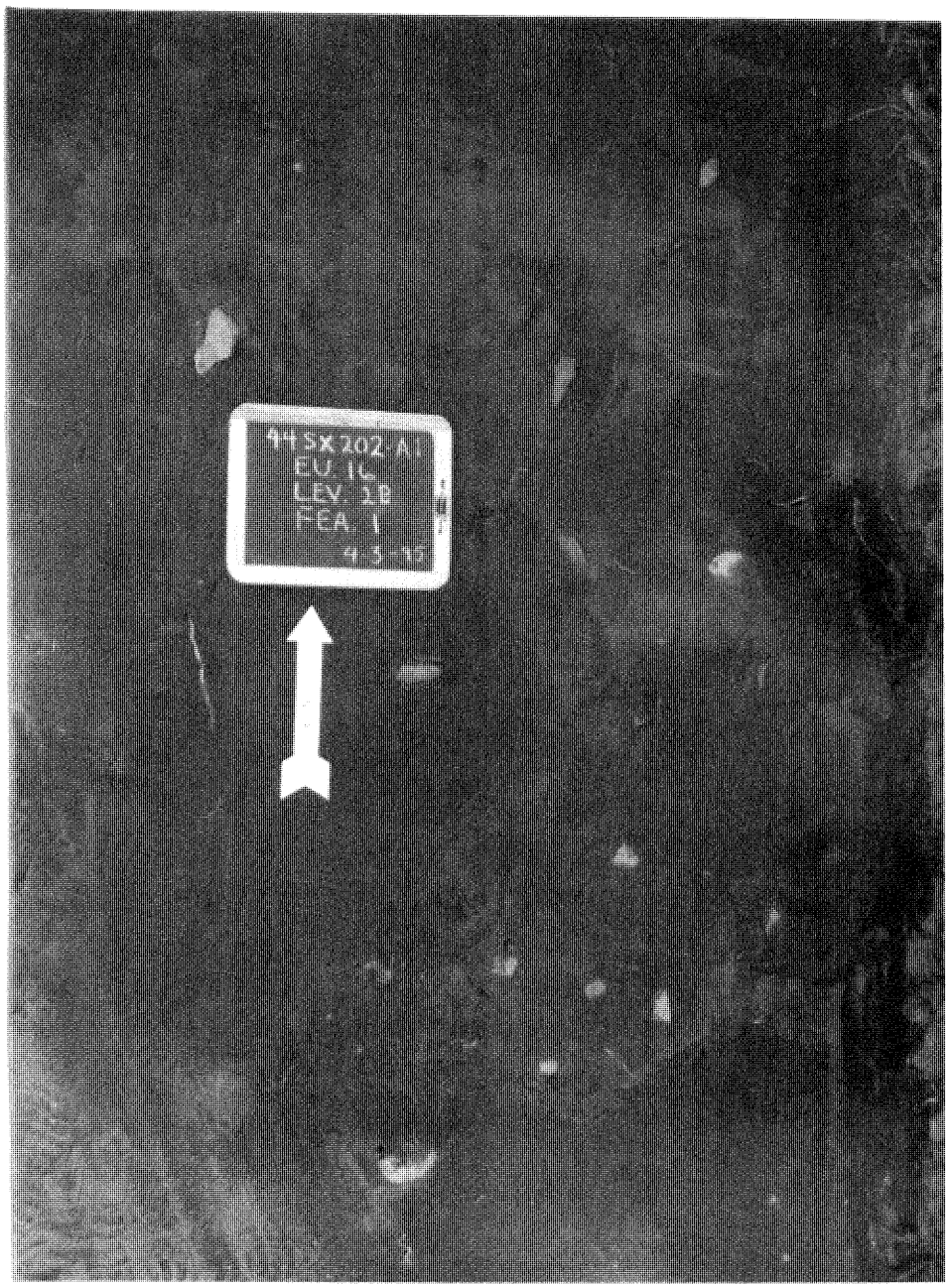

Figure 26. Feature B1.

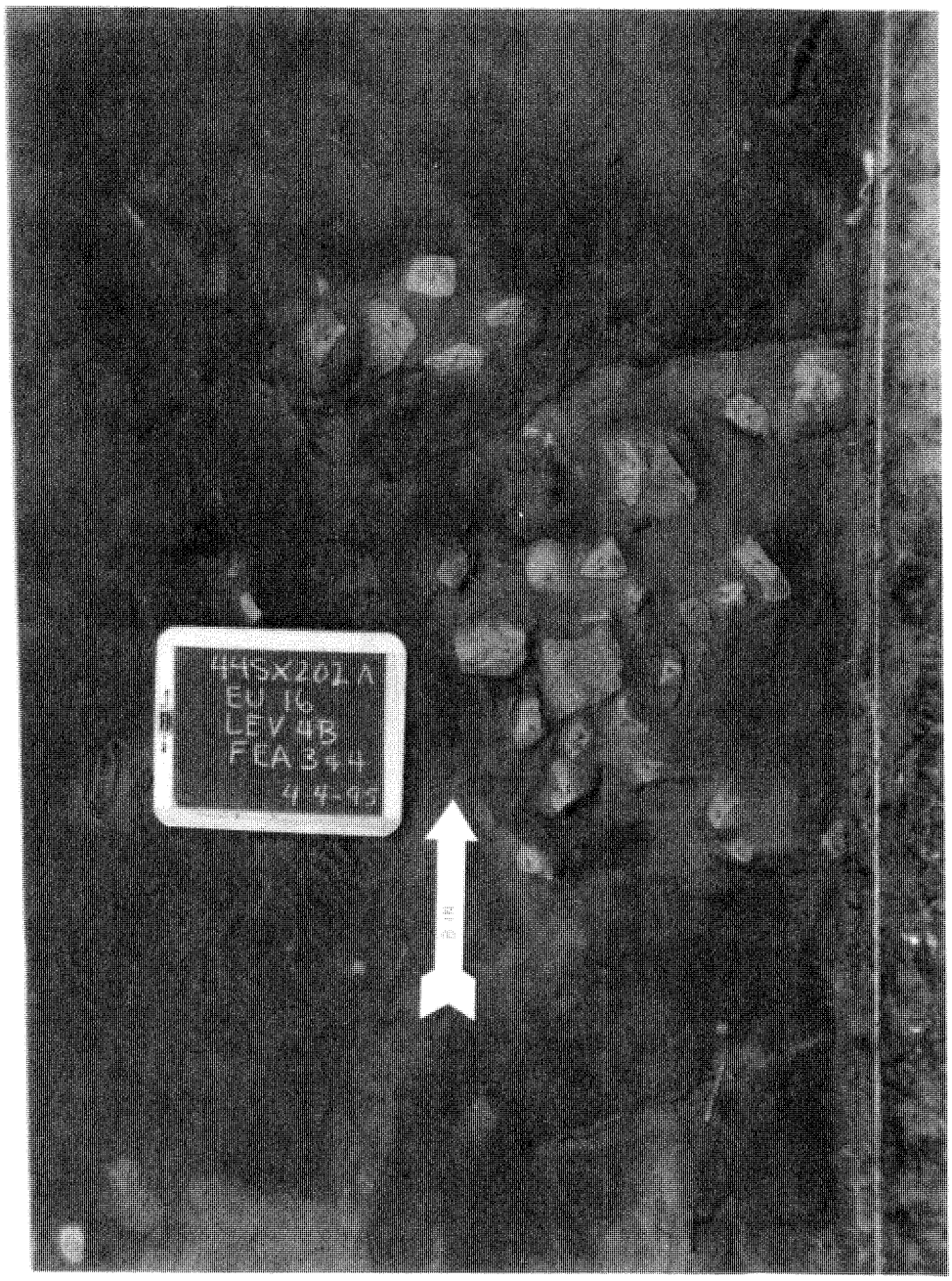

Figure 27. Feature B3, which is the large concentration in the right center.

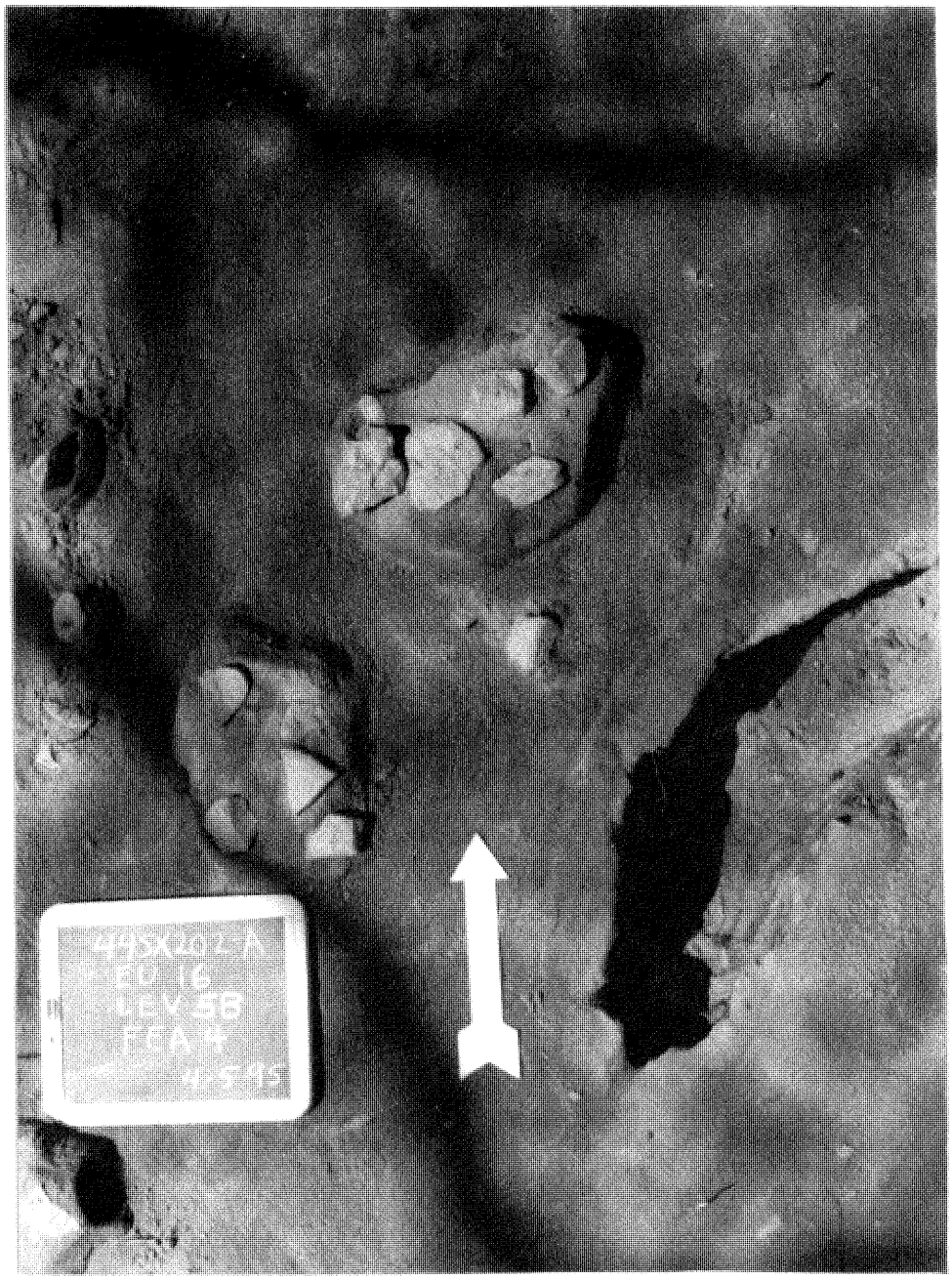

Figure 28. Feature B4.

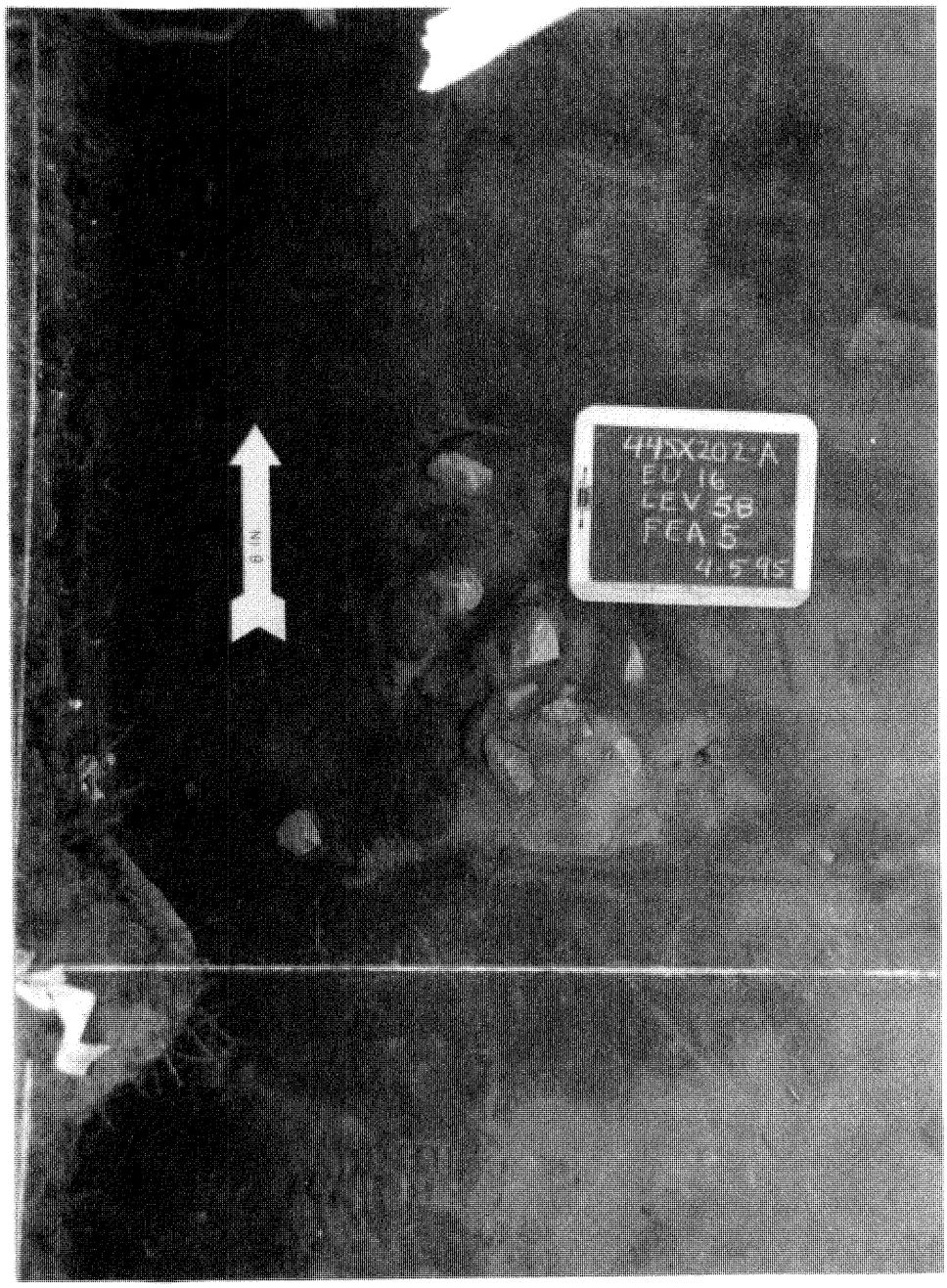

Figure 29. Feature B5-1.

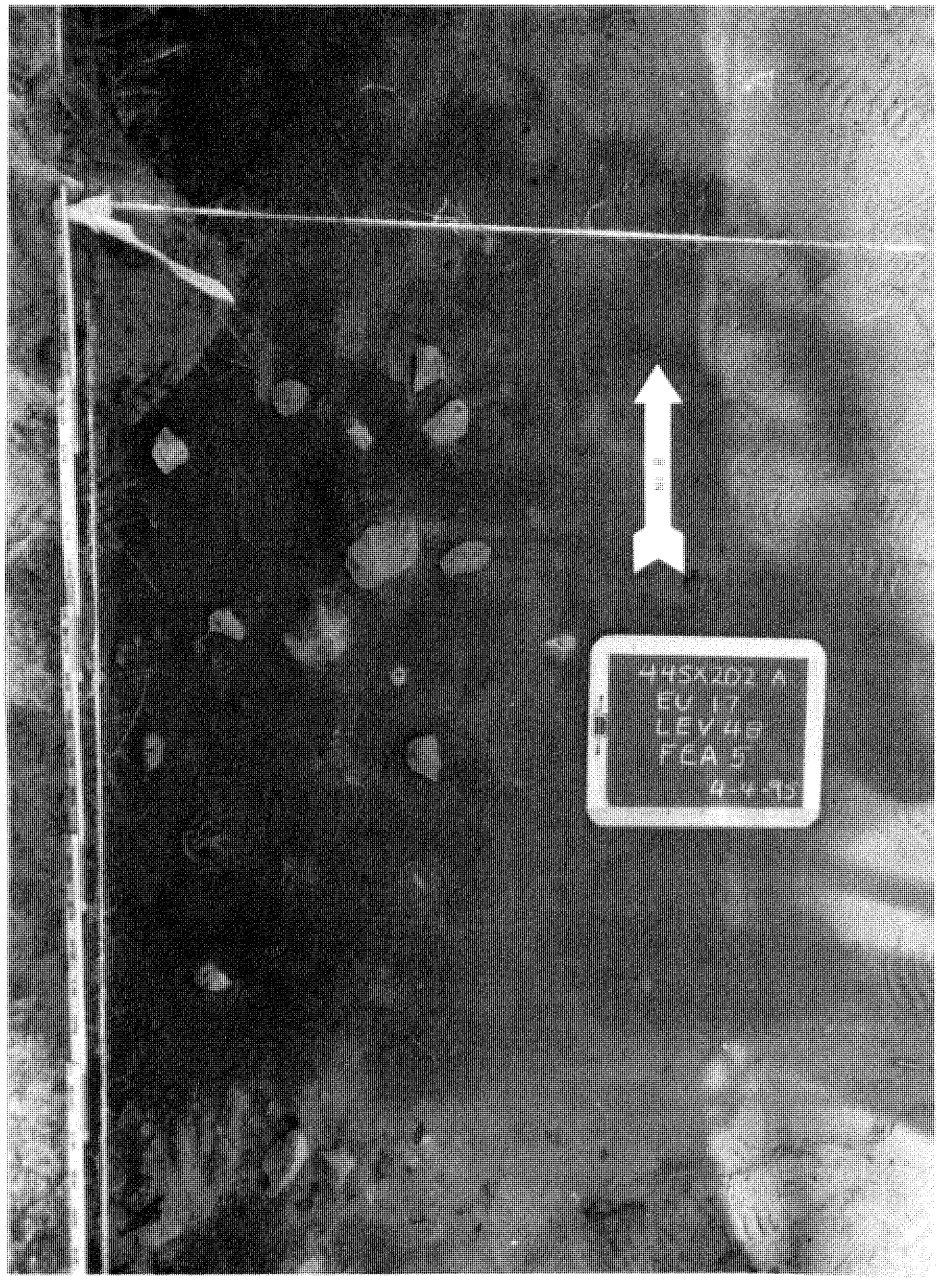

Figure 30. Feature B5-2.

point is a Bifurcate variant or some later point type. If it is later, such as Late Archaic or Woodland, then the whole feature may have been intrusive from an upper level and the Morrow Mountain and Kirk points were part of the feature fill.

Feature B6 (Figure 31) consisted of a cluster of seven quartz fire cracked rocks (700 grams), one quartzite debitage, one quartzite modified/worn lithic, and one pitted quartzite cobble (possibly a hammerstone) in unit 17, level 6 (Figure 2-8). Some of the fire cracked rocks began to appear at the bottom of level 4 and others appeared near the bottom of level 6. Therefore, the feature extended from the Morrow Mountain zone into the later part of the Early Archaic zone. Point fragments found in levels 5 and 6 included two Guilfords, one unidentified Morrow Mountain, one Kirk Stemmed, and two unidentified notched point fragments.

Feature B7 consisted of a two-foot diameter, light concentration of mostly nut charcoal in unit 17, levels 7 and 8 (Figure 2-8). According to McAvoy (this volume) nut charcoal should have dropped out of the assemblage at the end of the Middle Archaic period. The level above the feature produced a Large Palmer Corner notched point. Level 7 produced a reworked Ft. Nottoway point, and level 8 produced another large Palmer-like corner notched point (Figure 2-8). The feature was located in the Early Archaic zone but it may have been an intrusive feature from above.

Feature B8 (Figure 32) consisted of four mended quartzite fire cracked rocks adjacent to the east wall of unit 16, level 9 (Figure 2-8). Fourteen quartzite debitage and two pebbles were recovered from the sand between the rocks. Only a large Palmer-like corner notched point was recovered from that deep in the block. An endscraper was recovered from level 10 in unit 17. This feature is a good candidate for having been from the Early Archaic-Paleoindian transition.

Feature C1 consisted of a cluster of 28 quartzite fire cracked rocks (nine of which mended), five quartzite debitage, two quartzite modified/worn lithics, two quartzite bifaces, nine quartz fire cracked rocks (seven of which mended), three quartz debitage, two quartz modified/worn lithics, and one pebble in unit 19, level 5 (Figure 2-9). The high percentage of mended fire cracked rocks indicate an *in situ* feature, possibly a hearth or sweat lodge. This feature is probably Morrow Mountain or later.

Feature C2 (Figure 33) consisted of a heavy concentration of fire cracked rocks in unit 20, level 5 (Figure 2-9). Artifacts included 59 quartzite fire cracked rocks (26 of which mended), two quartzite debitage, one quartzite modified/worn lithic, 13 quartz fire cracked rocks (seven of which mended), two diabase fire cracked rocks, one unidentified piece of greenstone, and three pebbles. With almost 50% of the fire cracked rocks mending and the presence of only three other artifacts, feature C2 likely was either an undisturbed hearth or sweat lodge. Its location in the same level as feature C1 with no diagnostics other than one Woodland potsherd, indicates that this feature's age is probably Morrow Mountain or later.

Feature C3 (Figure 34) consisted of a small, tight cluster of artifacts containing three quartzite fire cracked rocks (two of which mended), one quartzite biface, three quartzite fire cracked rocks (one of which mended to a quartz pitted cobble fragment), one large quartz debitage, and two mended pitted cobble fragments. The feature was located in unit 19, level 8 (Figure 2-9) against the north wall. Here again, good integrity was indicated by the tightness of the artifact cluster and the high percentage of mends. Feature C3 was in the same unit and level with a Stanly feature (C4) and a Kirk feature (C5), which indicates that it probably dates to the Early-Middle Archaic boundary.

Feature C4 (Figure 35) consisted of a concentration of mostly fire cracked rocks with a point, a pitted cobble fragment and three pieces of debitage (that may have been intrusive) in unit 19, level 8 (Figure 2-9). Artifacts included five quartzite fire cracked rocks, one quartzite debitage, one quartzite pitted cobble fragment, one quartzite Stanly-like point (Figure 16), two quartz fire cracked rocks, and two greenish patinated meta-volcanic flakes. The meta-volcanic flakes were similar to those found in feature C5 which was a chipping station associated with a heavily curated Kirk Serrated point made of the same material. The Stanly-like point was the only one of its type recovered during the two excavation seasons. Feature C4 was slightly higher in the profile than the main horizontal concentration of meta-volcanic flakes in feature C5, which would indicate that it was later and probably of Stanly age.

Feature C5 (Figure 36) was a relatively unique chipping station in the southwest corner of unit 19, level 8 (Figure 2-9). It was recognizable because it consisted of mostly medium to small greenish patinated meta-volcanic flakes (19 in all). Other artifacts recovered from between the meta-volcanic flakes included five quartzite debitage, three quartzite

Figure 31. Feature B6.

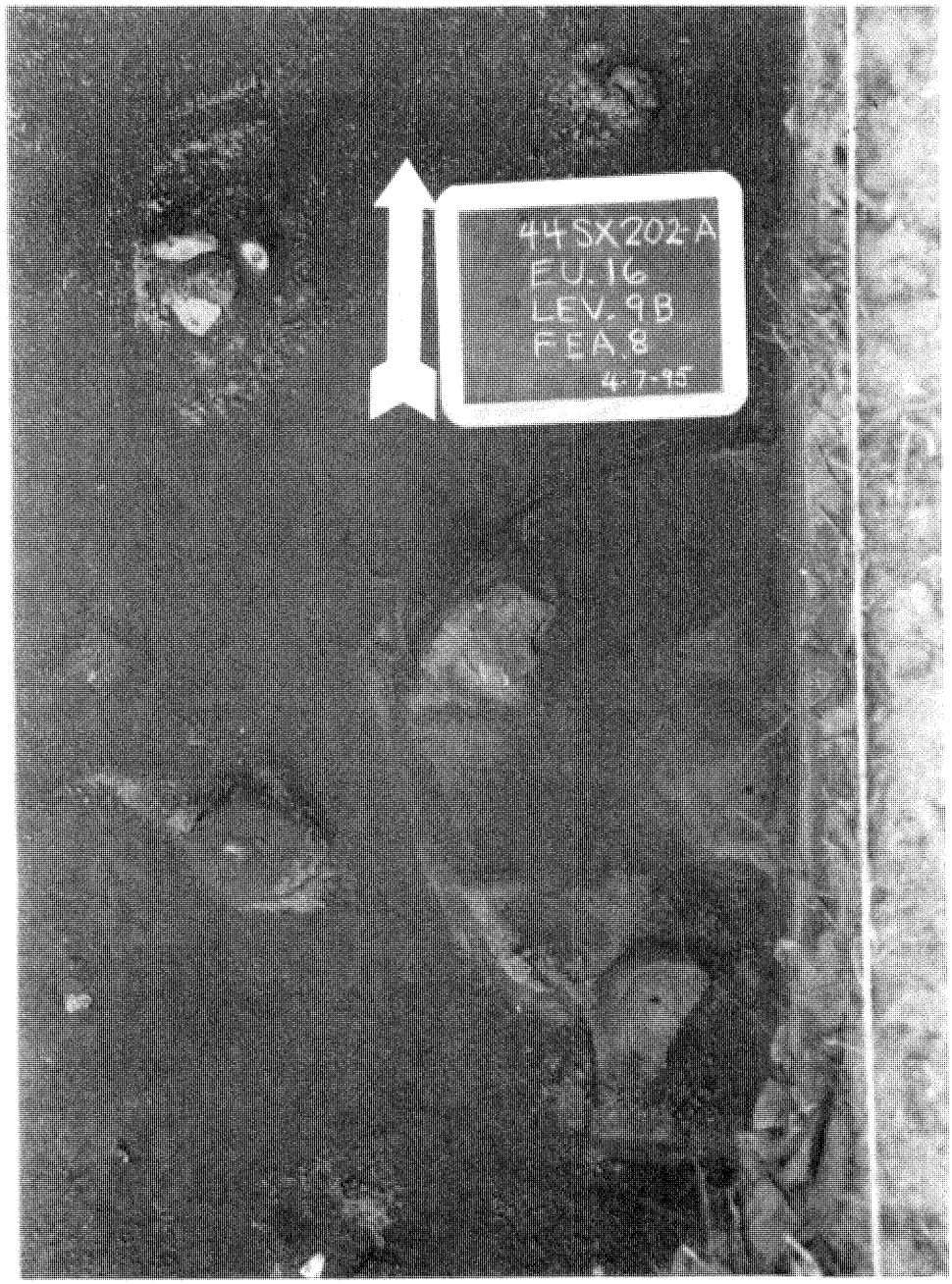

Figure 32. Feature B8.

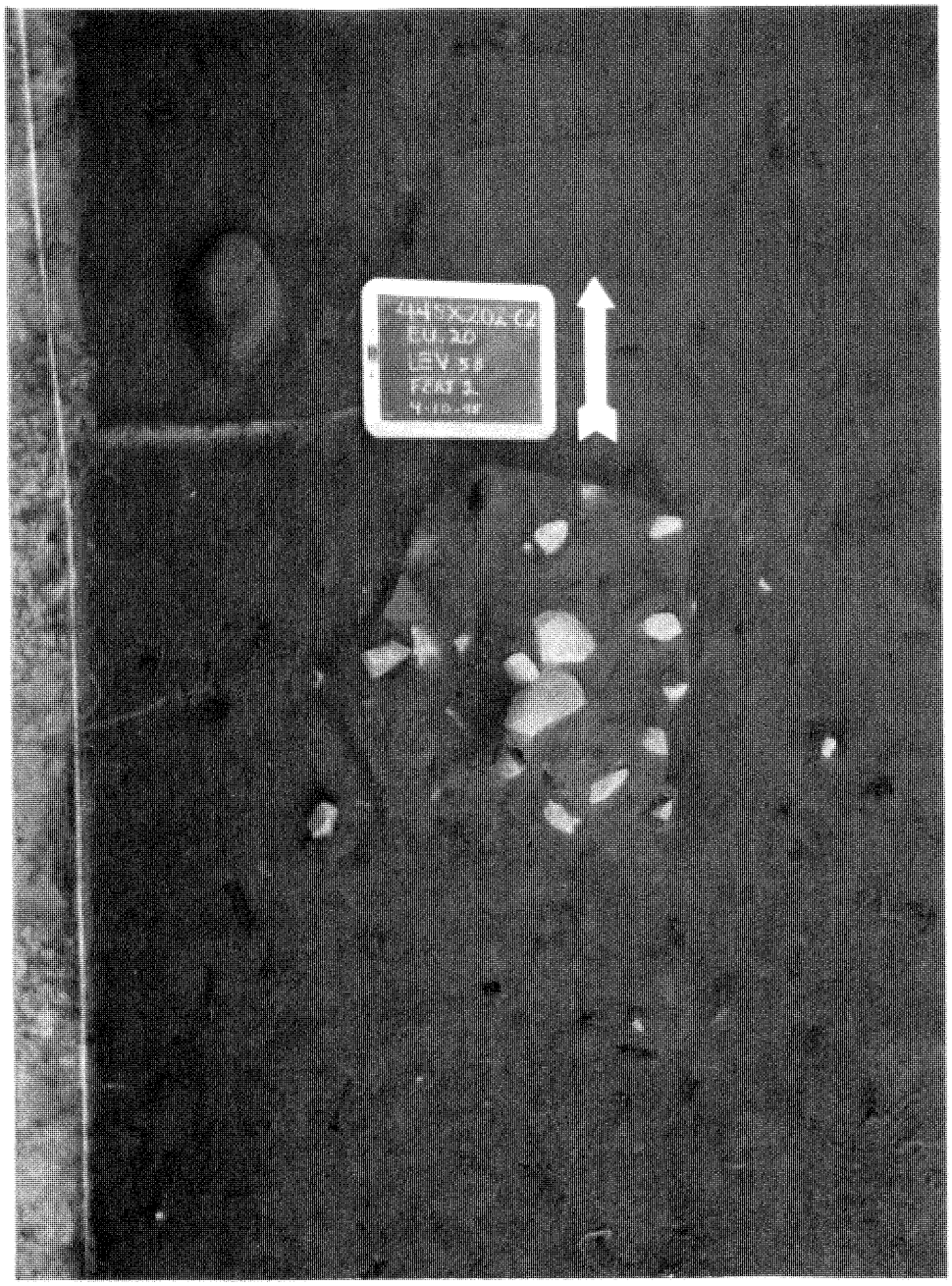

Figure 33. Feature C2.

Figure 34. Feature C3.

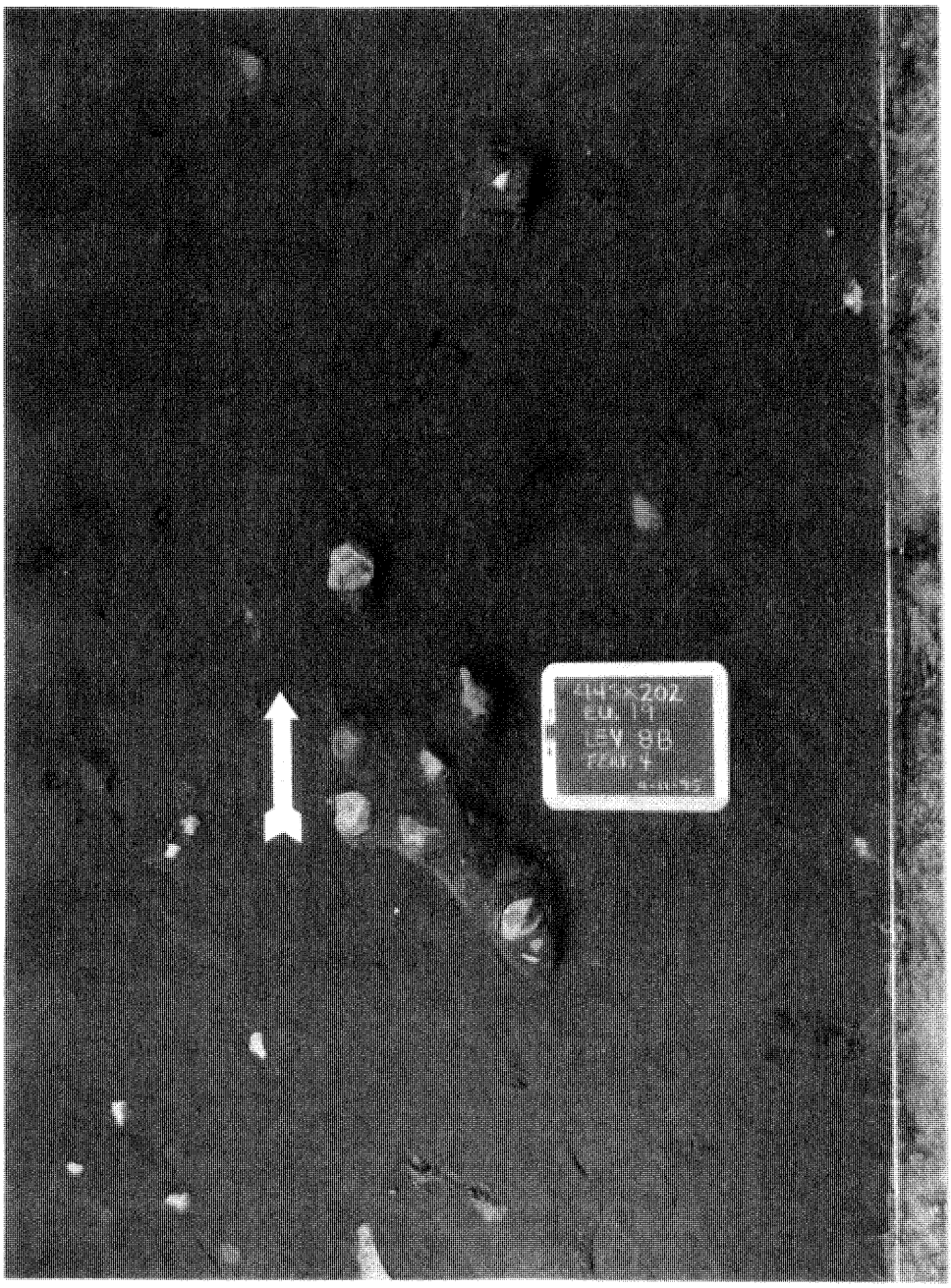

Figure 35. Feature C4 (note Stanly-like point next to chalk board).

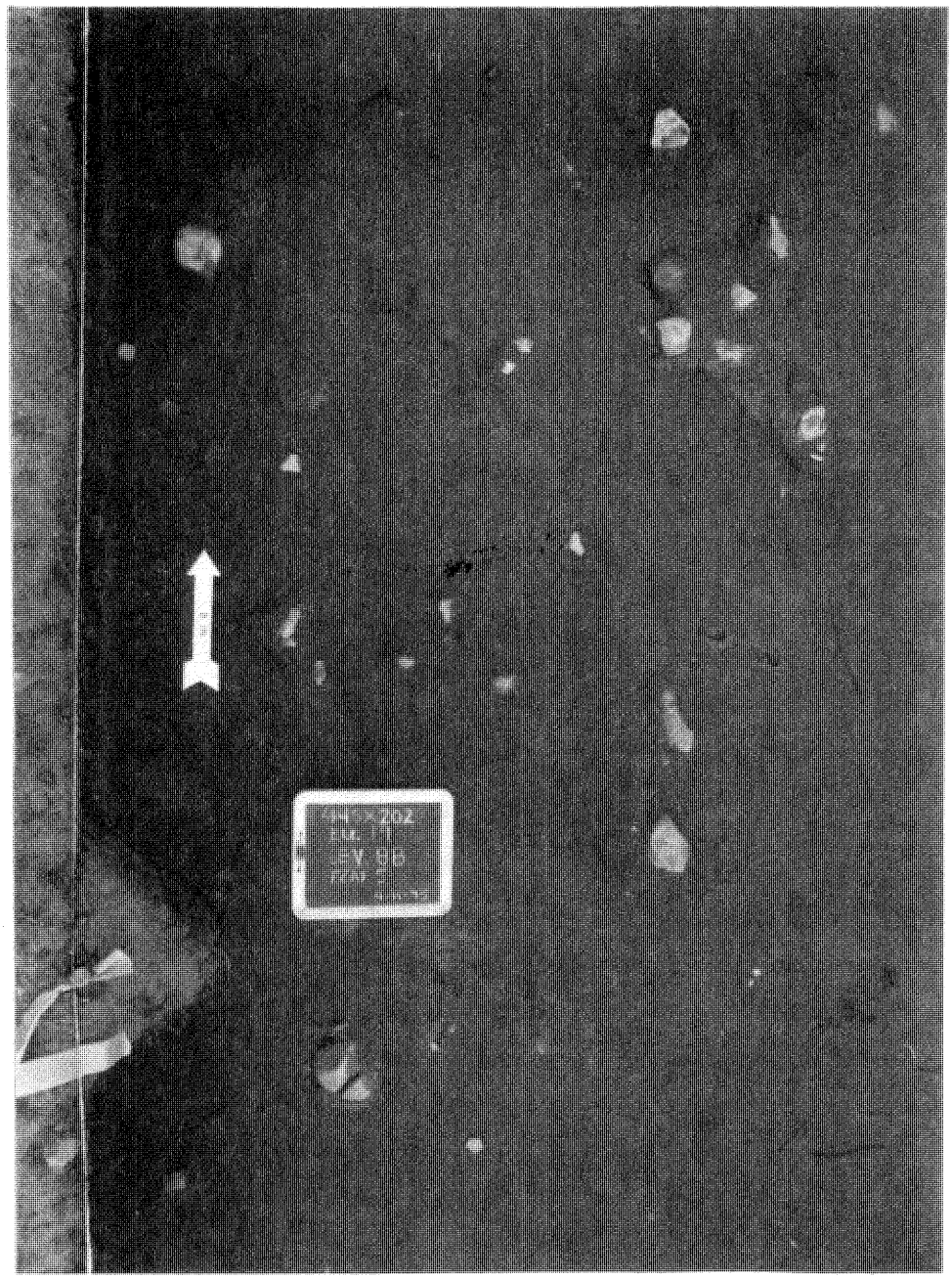

Figure 36. Feature C5 (note feature C4 with the Stanly-like point in the northeast corner of the photo.

modified/worn lithics, one quartz debitage, two quartz modified/worn lithics, one pitted quartz cobble, one quartz uniface, one bipolar quartz debitage, and one pebble. Feature C4 was located about one foot to the east of and slightly above this chipping feature. A little more than a foot to the north of feature C4 was a reworked Kirk Serrated point (Figure 15) made of the same material as in the chipping feature. As can be seen from Tables 1-13 and 1-14, the meta-volcanic artifacts peaked in levels 8 and 9 but are found in most levels in units 19 and 20. Matching and mending may be possible which would be very helpful in determining the amount of disturbance to these two units.

Feature C6 (Figure 37) was also in unit 20, level 8, along the west wall (Figure 2-9). It consisted of a tight cluster of artifacts including one spurred quartzite flake (graver), one quartzite uniface, three quartz fire cracked rocks (two of which mended), one quartz uniface, and three moderate-sized meta-volcanic debitage. The meta-volcanics were of the same type found in feature C5. The presence of tools and worked pieces in this feature indicate functions beyond a hearth or sweat lodge. A Kirk Stemmed point (Figure 14) was recovered from two feet away to the southeast. (Figure 38 is an overview of units 19 and 20, level 8 with Features C3 through C6, and other mapped artifacts.)

Feature C7 (Figure 39) was another chipping station which was partially mapped in unit 19, level 10 (Figure 2-9). Mapped artifacts included nine moderate to large, bluish-gray quartzite flakes. Numerous other flakes of the same material were recovered from within one foot of the mapped flakes and recovered as level bulk. The mapped flakes came from a one-foot diameter area. Their size was consistent with large biface reduction and their color was consistent with the large, broken Ft. Nottoway-like preform base recovered from level 11 of unit 20.

Feature C8 consisted of a light, oval concentration of mostly wood charcoal around and below the large bluish-gray preform base mentioned above. The concentration was about two feet across with about half of it located in unit 20 and the rest extending into the west wall of the unit. It extended through levels 11 and 12 and disappeared in level 13 of unit 20 (Figure 2-9). If the preform is Ft. Nottoway then the charcoal should produce a good date for that period. Two Bifurcate points were recovered from level 10, one being from unit 19 and the other from unit 20 (Figure 2-9). This indicates that level 11 should be in the later part of the Early Archaic period.

Particle Size Analysis (Attachment 3)

During the excavation of block A, sand samples were taken only from below selected large artifacts and from features. As a result, not all levels were sampled. Following the excavation of blocks B and C, columns of 2x2x1-inch sand samples were recovered from a selected wall in one unit of each block. The columns were selected from areas where there were the fewest roots in the upper part of the wall. Tables 3-1 through 3-3 show the results of particle size analysis done on the sand from each block.

The block A analysis in Table 3-1 is organized in stratigraphic order by level. No sand was recovered from levels 1, 2, 5, 6, 11, 13, 14 and 15. These levels did not produce features from which sand was recovered. Note that all of the samples from non-feature sources (unit 9, level 9 (two samples); unit 5, level 10, and unit 2, level 12) all have similar particle size percentages. Sand from features A1, A2, A3(1), and A4 also have particle distributions similar to the non-feature sand. The percentages are consistent with most of those recovered from blocks B (Table 3-2) and C (Table 3-3). However, the remainder of the block A features produced a wide range of percentages.

Two possible explanations are that the vertical sand structure in units 2 and 9 are similar, or that feature sand may possess a different structure than the surrounding level sand. The fact that the two samples from feature A3 have different percentages supports the alternative that the content of feature sand can differ from the surrounding matrix. Since all of the sand on the site probably was formed by the same process with only gradual changes occurring from the top to the bottom of the profile, some cultural action probably affected the sand in certain features. Since all of the sand samples were processed in the same manner, it is not likely that the differences are due to processing. All of the samples were retained for future study.

Summary and Conclusions

The method used on the Northern Virginia Chapter's portion of the 1993-1995 excavations at the Cactus Hill Site (44SX202) were designed to support McAvoy's current and previous work on this and other sites in the Nottoway River drainage (McAvoy

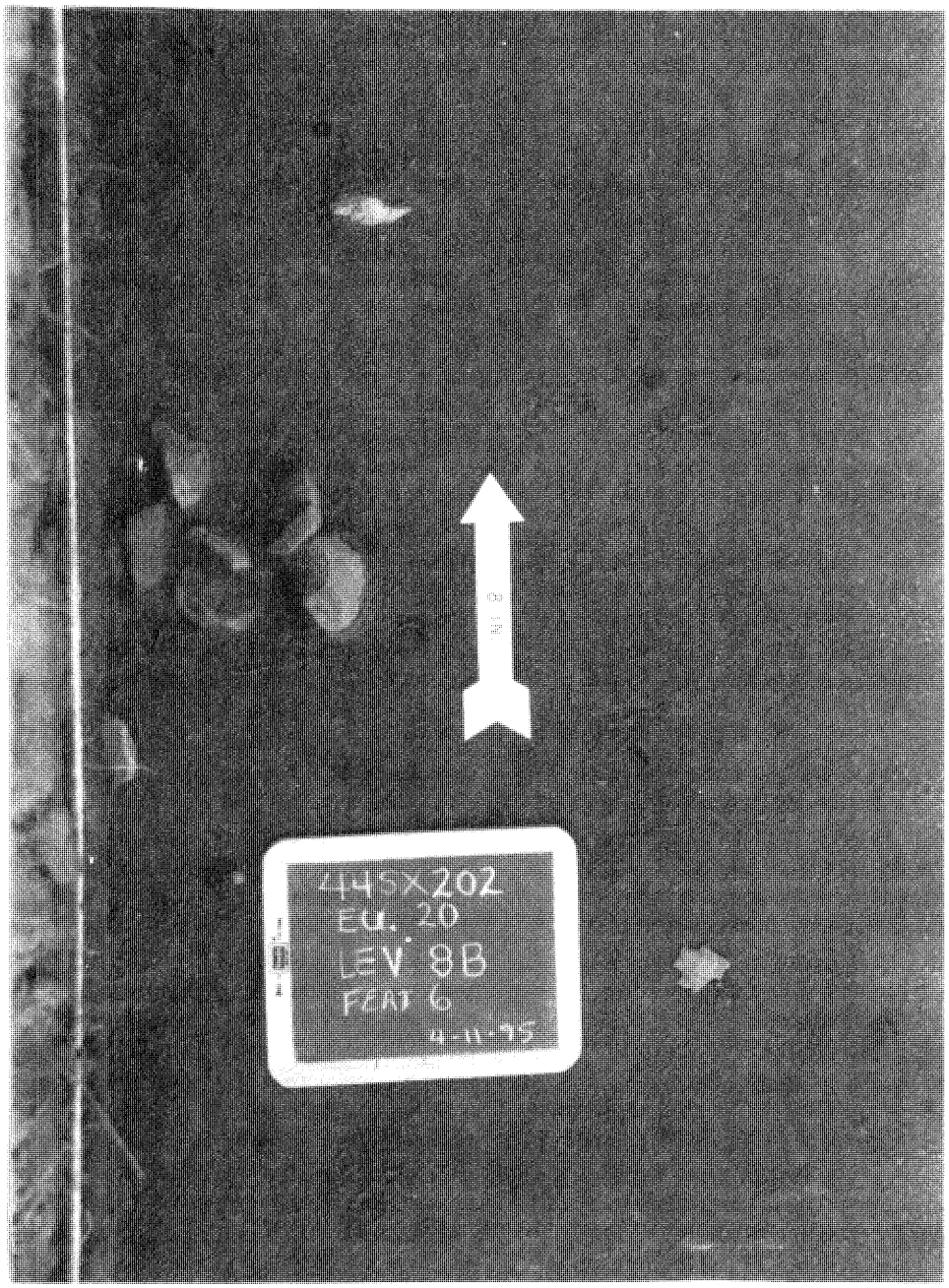

Figure 37. Feature C6 (note the Kirk stemmed point base in the lower right quadrant of the photo.

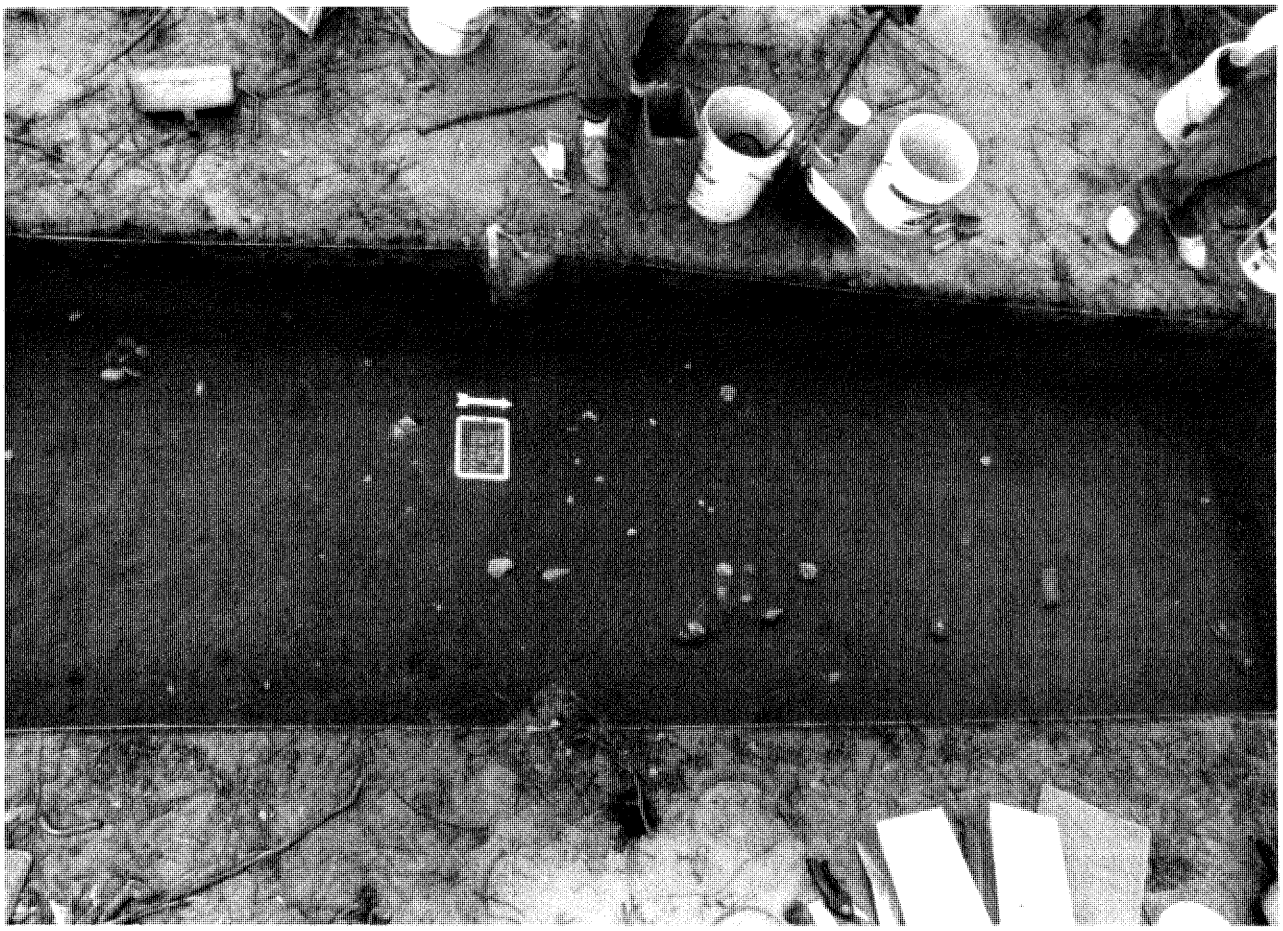

Figure 38. Units 19 (top) and 20 (bottom), Level 8 showing Feature C3 (upper edge, adjacent to north wall), C4 (right center), C5 (left center), and C6 (lower left, adjacent to west wall). The Kirk serrated made of the same material from Feature C5 is the pedestaled small white dot about a foot and a half north of the Stanly-like point in Feature C4.

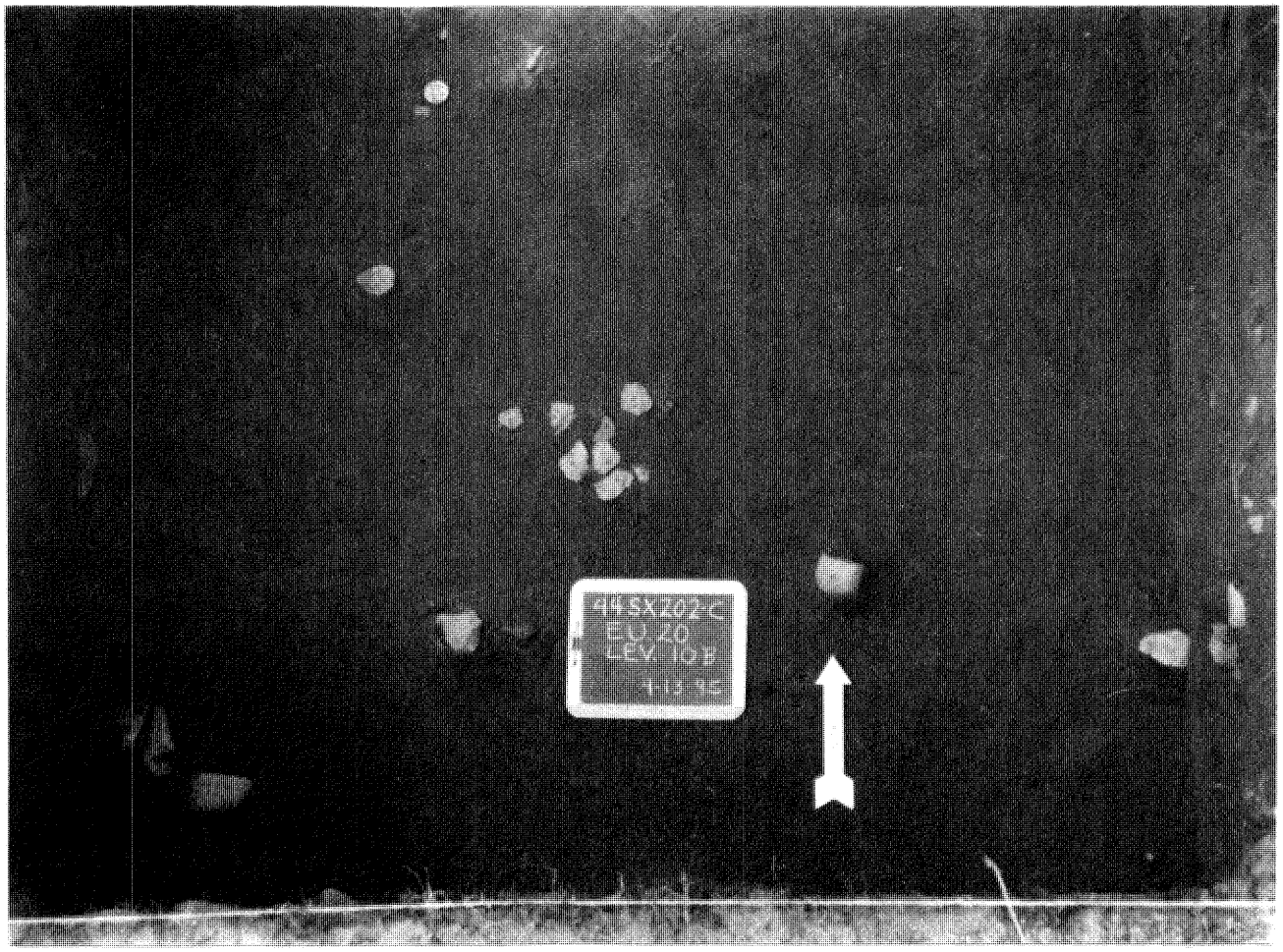

Figure 39. Feature C7.

1992). Three blocks (A, B, and C) were excavated during two two-week sessions on the site (Figures 2 and 3).

The slope of the arbitrary levels in block A (excavated in 1993) were determined during subsequent lab work not to have been the same as the cultural levels. This was due, in part, to mechanical removal of the plowzone. The plowzone was manually removed from blocks B and C (excavated in 1995) which greatly reduced the level correspondence problem during those excavations. As a result, in the southern units in block A (units 1-6, 8-9, and 12-13), any correlation of plotted diagnostic artifacts and features to unplotted artifacts from the same arbitrary levels cannot be determined without detailed lithic analysis, including mending. Units 14 and 15 appear to have been located on the southern edge of the top of a truncated Paleoindian dune and, therefore, the arbitrary levels appear to have more accurately mirrored the cultural levels.

Even in blocks B and C the problems with relating level artifacts is tenuous at best. The site's sand matrix clearly allowed movement of lithic artifacts, ceramics, bones, charcoal, and any other items, mostly down through the profile. However, this movement appears to have been more common with the smaller items. Larger items often appear to have been significantly more stable as there are numerous mends between these items within the same feature. No attempt was made to mend artifacts recovered from outside of the features. Obvious artifacts made from the same core, a general stratigraphic consistency with diagnostic points, and obvious *in situ* features indicate that there were significant areas with relatively undisturbed context. The magnitude of the disturbance seems to have diminished with increased depth, i.e., the potential for undisturbed features was greater below the termination of the Morrow Mountain zone.

The idealized profiles shown in Attachment 2, indicate that the termination of the Morrow Mountain zone was identifiable, even in block A. In the Early Archaic zone it was clear that the separations between temporal zones were fuzzy and at times they were mixed. This was probably due to the generally compressed nature of the cultural levels: the sand build-up may have been slower than within the Middle Archaic zone, and particularly within the Morrow Mountain sub-zone, which was relatively thick throughout the three blocks.

Horizontally, there are recognizable areas where certain time periods (as represented by diagnostic artifacts) are present, more prevalent, or absent. For example, the northeast corner of Block A produced the only evidence for Hardaway and earlier Paleoindian occupations. Unit 12 produced what appeared to be a Guilford living floor.

Block B produced only one potsherd while the other two blocks had noticeable prehistoric ceramic components in the upper levels. Block B, which was only 100 square feet, produced three large Palmer-like corner notched points from various Early Archaic levels. Feature 8 in level 8 and 9 of unit 16 consisted of four large fire cracked rocks which mended.

Block C produced no diagnostics below the two Bifurcate points in level 10. However, a probable Ft. Nottoway preform base and large quartzite chipping feature were recovered from below the Bifurcates. Four clearly identifiable features came from level 8 of block C. Two, including a unique greenish meta-volcanic chipping feature, appeared to have been associated with Kirk points. One of the other two contained a Stanly-like point. The plowzone of block C also produced the heaviest evidence for historic Colonial activity.

There is little question that the Cactus Hill Site has areas with excellent integrity and that undisturbed features are present. Carbon dating is complicated by the movement of charcoal down through the profile and the potential for intrusive Woodland and Late Archaic pits. However, samples from the NVC's excavations will be analyzed for species in order to identify associations with particular climate episodes. Hopefully, additional radiocarbon dates can be obtained for the various cultural phases present at this site.

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Addendum

Preliminary Description of Cactus Hill 1996 Excavations by the Northern Virginia Chapter-ASV

In the fall of 1996, the NVC/ASV conducted a re-excavation and expansion of the northeastern corner of block A (Figure 40). The new excavation consisted of opening six new 10x10 foot units (21, 22, 23, 24, 26, and 27) and re-opening units 14 and 15 from the 1993 excavation. This was in response to McAvoy's (1996, personal communication and this volume) analysis of the relationship between fluted point and deeper blade levels as well as new conclusions regarding the configuration of deeper strata in the sand dune (see McAvoy and also Johnson this volume).

The northeastern corner of block A already was determined to contain stratified Paleoindian levels, particularly in unit 14. During 1993, time constraints and a belief that no cultural material would occur below the fluted point level resulted in excavations being terminated at the end of level 10, which was one level below where the last Paleoindian artifacts were recovered.

Methods

Prior to the 1996 field season, Dennis Stanford (1996, personal communication) of the Smithsonian Institution advised that all artifacts be mapped in three dimensional coordinates. During previous seasons only functional and temporal diagnostic artifacts (1993), artifacts in features (1993 and 1995), or artifacts larger than a certain size (1995) were mapped in three dimensions, including top and bottom depth. During 1996, each two-inch level below level 5 was subdivided into either one-half or one-inch sub-levels, depending on the quantity of artifacts. Within the half-inch sub-levels all observed artifacts and charcoal were mapped in two dimensions, and within the one-inch sub-levels all observed artifact and charcoal were mapped in three dimensions with top and bottom depth readings being taken. In level 5 and above, all artifacts larger than a 25 cent piece (quarter) were mapped in three dimensions, including top and bottom depths.

Analysis

The new analysis indicated that the presence of laminated dark silt banding alternating with light-colored, silt-free sand in the deeper levels of the dune corresponded to an earlier dune formation, dating to before the Early Archaic period. The formation of the separated silt bands probably corresponded to the markedly wetter conditions that occurred throughout the Late Glacial, Paleoindian period, and possibly including the Younger-Dryas (Johnson 1996:190). During the 1996 excavation, the southern edge of the silt banding was mapped by level in units 14 and 27. The results indicated that the surface of the silt banding sloped down to the south at about one inch per foot of horizontal distance.

Of particular note was probable confirmation of the Paleoindian level by the recovery of a jasper blade-like flake (item 23-9-16) along with a large quartzite flake struck from a prepared core (item 23-9-17), both in heavy silt banding in the north west corner of unit 23, level 9 (Figure 41). Also a fluted point preform base (item 15-9/10-1) was recovered from between 40 and 44 inches below datum (level 9/10) in the southern wall of E.U. 15. All three artifacts are shown in Figure 2 along with other diagnostic artifacts from the Paleoindian levels of unit 14. Note that Late Paleoindian (Hardaway Sidenotched point: item 14-6-6 and possibly item 14-8-4) and an Early Early Archaic diagnostic (the large Palmer-like corner notched point: item 14-6-25) occurred in levels 6 and 8 (initial 1997 excavations in E.U. 15, 26, and a new unit south of E.U. 15 produced Ft. Nottoway, Decatur, and Kirk Corner Notched points in levels 6-8). In 1993, level 9 produced the probable fluted point fragment (item 14-9-2) and endscraper (14-9-3), both made of a highly silicified, meta-volcanic stone.

Most importantly, also in 1996, the five blades and two mended pieces of the same lanceolate point, shown in Figure 42, were recovered in heavy silt banding in the northern half of E.U. 24 - level 14, nine inches below the deepest recognized Paleoindian level. The nine-inch separation between Paleoindian and unfluted lanceolate points with small blades contrasts with the two-inch separation between similar kinds of artifacts found by McAvoy further west in the silt band crest (see McAvoy, this volume). The implication is that the stratigraphy is significantly deeper at the eastern end of the site.

All seven artifacts were measured to within one-half inch of 48 inches below datum, and occurred

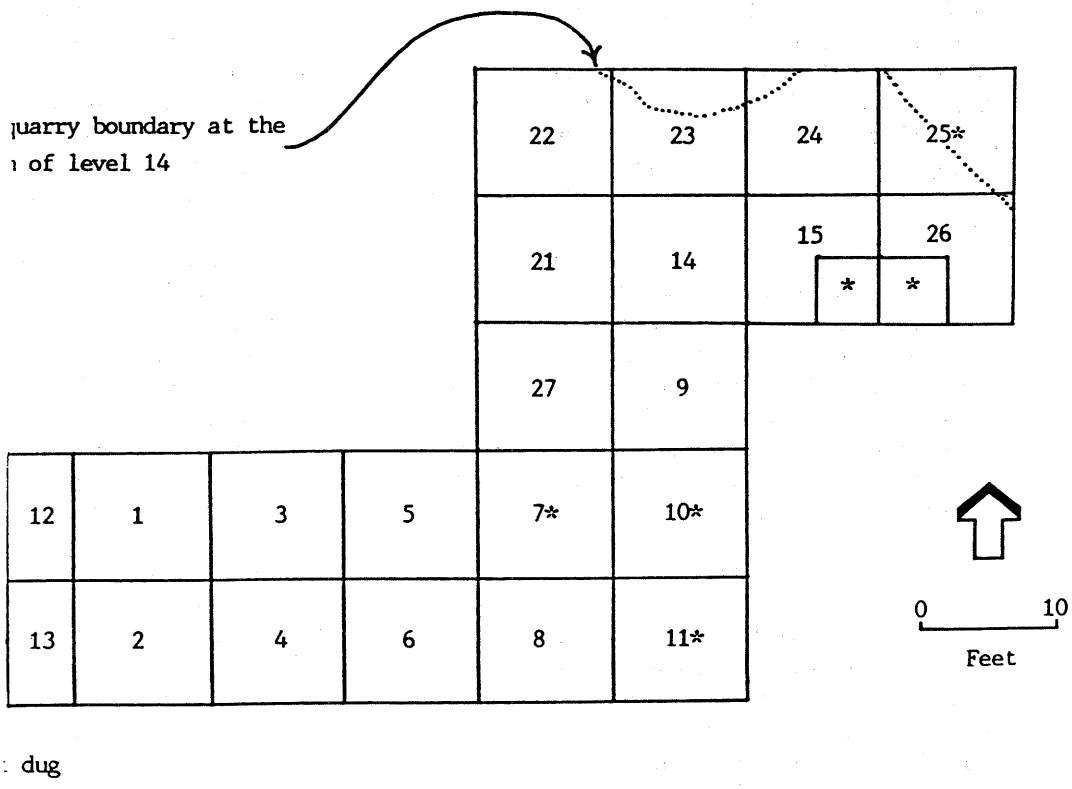


Figure 40. Block A showing the 1993 and 1996 excavation units. Note that one quad each of Unit 15 (southeast) and 26 (southwest) were not excavated due to the presence of a tree.

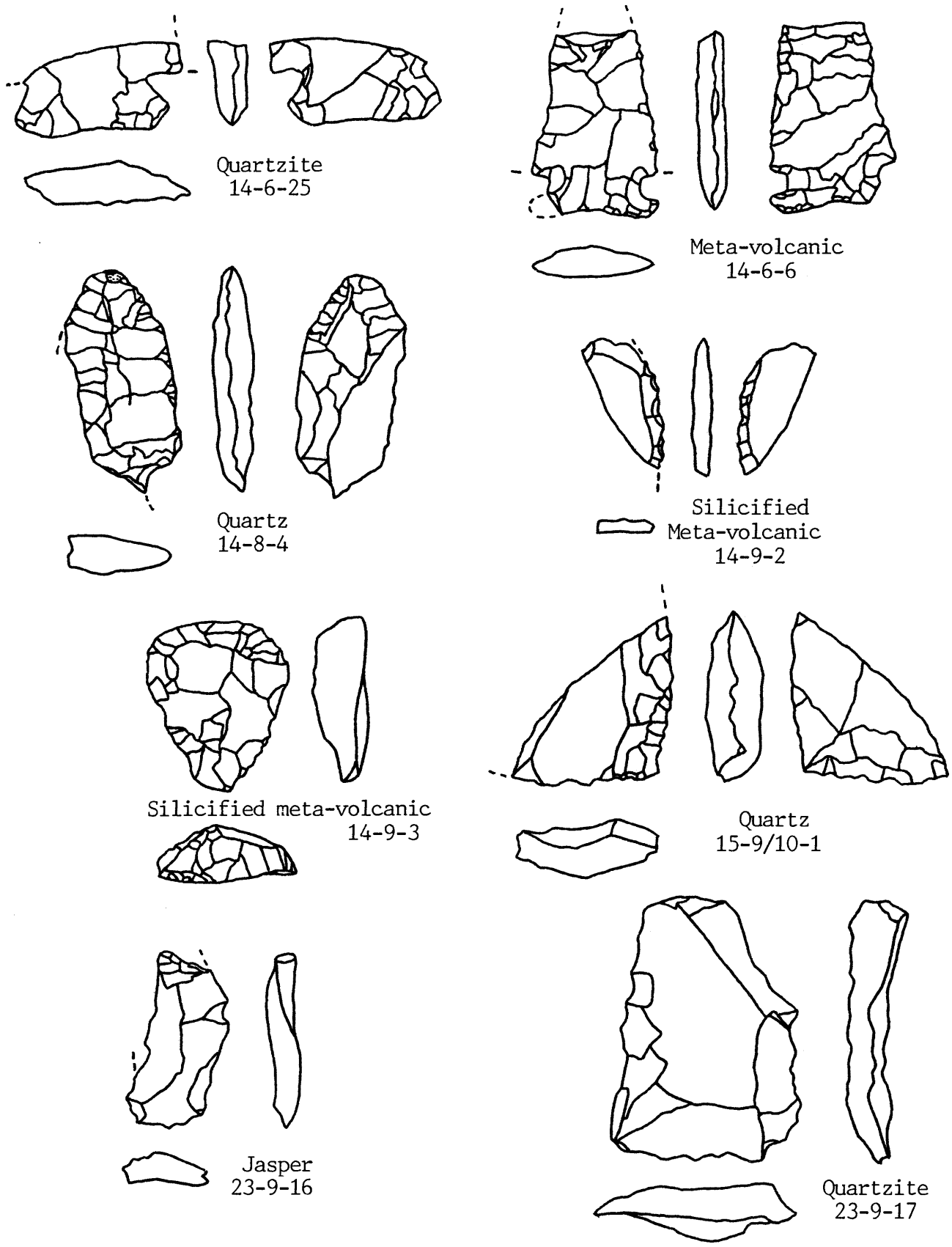


Figure 41. Selected artifacts from the Paleoindian levels (6-9) of Units 14, 15, and 23. All artifacts are to scale.

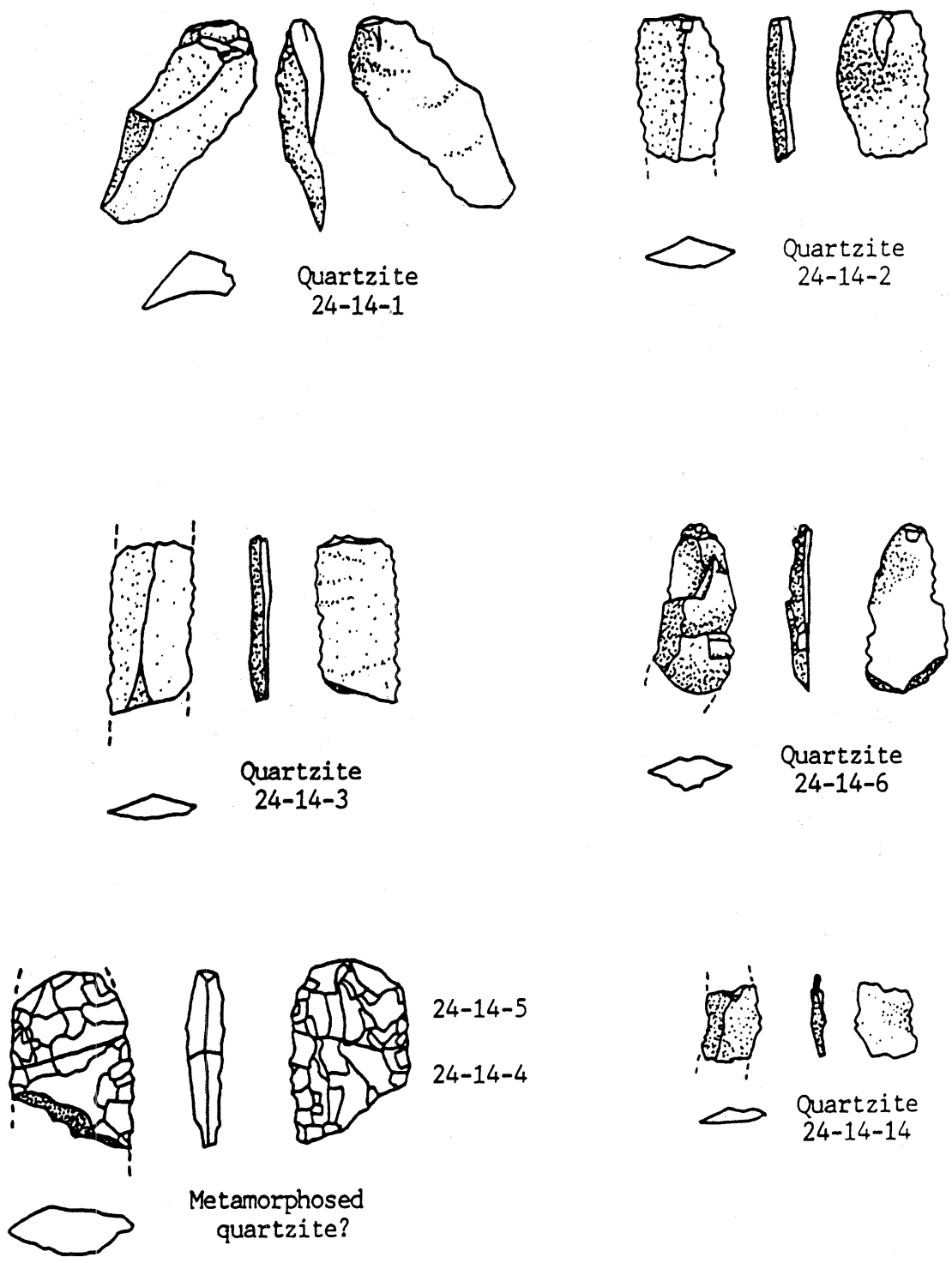


Figure 42. Blades and point fragments from Unit 24, Level 14. All artifacts are to scale.

in a relatively straight, east-northeast to west-southwest line. This line roughly parallels the former crest of the buried dune. Figure 43 represents the horizontal position of the artifacts in level 14 of E.U. 24. As can be seen from Figure 43 individual pieces of charcoal also were plotted. They are yet to be analyzed.

Although units 14, 15 (northeast, northwest, and southwest quads), 23, and 24 were all taken to the bottom of level 14 before the end of the field season, no additional blade clusters were recovered. Current plans are to expand the northeast corner of block A to a 30x30 foot area and to proceed to deeper levels in 1997.

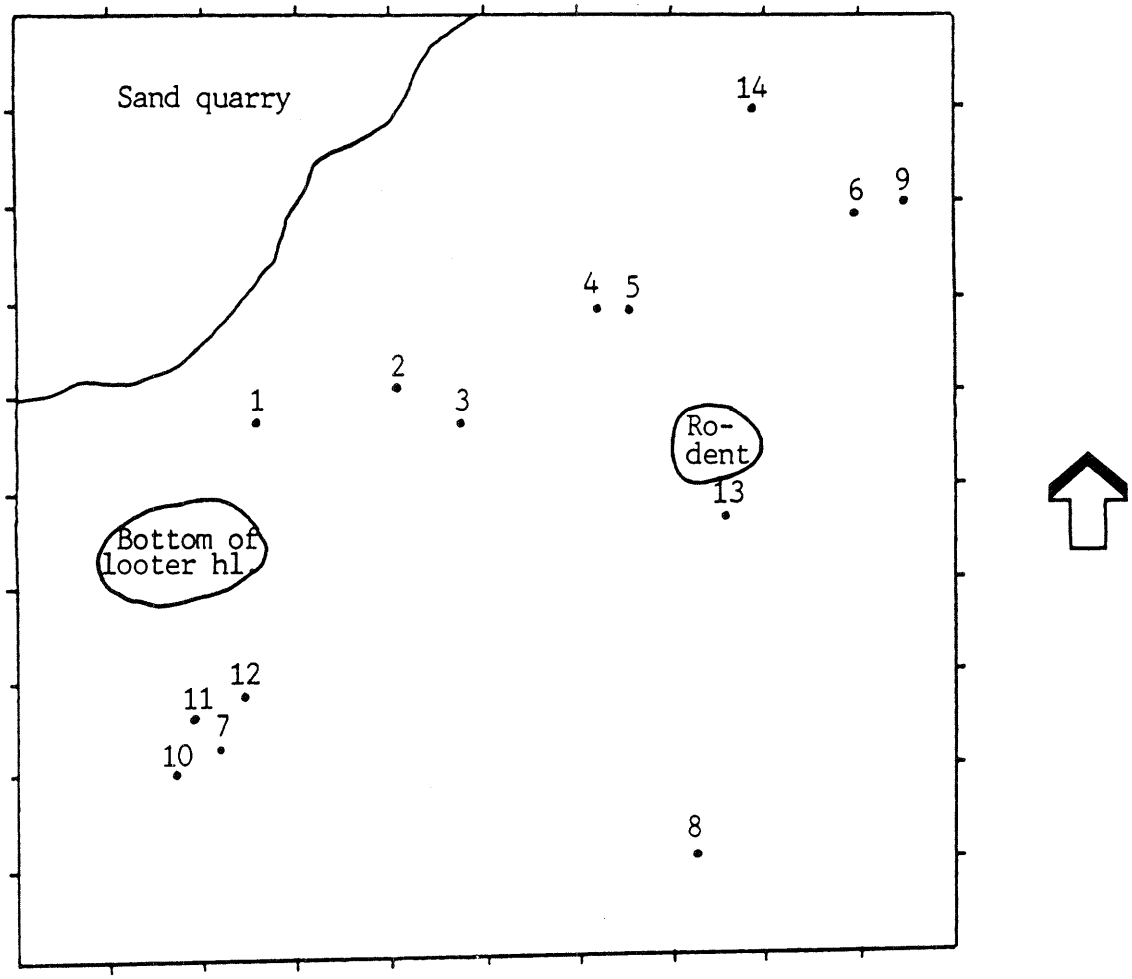
Preliminary Conclusions

With no positively identified fluted points, the probable fluted point fragment (item 14-9-2) and fluted preform base (15-9/10-1) not withstanding, which were recovered from Paleoindian levels of block A (levels 6-9)(Figure 41), it is possible that the blades and point fragments in unit 24, level 14 are associated with fluted points. However, the artifacts from level 9 (items 14-9-2, 14-9-3, and 15-9/10-1 in Figure 41), when taken in the context of the Early Archaic/Late Paleoindian artifacts from levels 6-8, strongly suggest that the blades and point fragments in level 14 are indeed pre-fluted point in age and roughly correspond to McAvoy's latest Cactus Hill blade/unfluted lanceolate phase. The lack of other formal Paleoindian tools, like endscrapers, sidescrapers, spokeshaves, spurs, wedges, and yellowish chalcedony trim flakes common in fluted point contexts, in levels 10-14 further supports a pre-fluted point age for that level.

The blades and mended point fragments in level 14 of unit 24 are from an undisturbed context in heavy silt banding. Their positioning in a relatively straight line, and at the same depth, indicates concurrent deposition, possibly in the form of having been trapped against some linear object or structure.

Reference Cited

Johnson, Michael F.
1996 Paleoindians Near the Edge: a Virginia Perspective. In *The Paleoindian and Early Archaic Southeast*, edited by David G. Anderson and Kenneth E. Sassaman, pp. 187-212. University of Alabama, Tuscaloosa.



1 Quartzite blade
2 Quartzite blade frag.
3 Quartzite blade frag.
4 Meta-quartzite (?) point frag.
5 Meta-quartzite (?) point frag.
6 Quartzite blade frag.
7 Charcoal
8 V. small chert flake *
9 Small quartz flake frag **
10 Charcoal
11 Charcoal
12 Charcoal
13 Charcoal
14 Quartzite blade (?) frag.

* Williamson-like chert
** Quartz crystal or possibly clear glass from adjoining disturbance in wall of E.U. 25, which contained broken glass. Found on surface of second one-inch sub-level of level 14 after previous sub-level had been mapped.

Figure 43. Floor plan of Unit 24, Level 14, including all mapped items.

ATTACHMENT 1

Tables of Temporal and Functional Diagnostics

Table 1-1. Temporal and functional diagnostics from Block A, Unit 1.

Level	Quartzite							Quartz							Chert/Jasper							Level
	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	DE	
1	4				1																	1
2	4			5	2			2													1	2
3	17			6	7	1	1	3	3					2							12	3
4	22				5	2		7													8	4
5	29	2		1	9			1	3		1										2	5
6	10	1		1	3		1	1		1		2									2	6
7	8	1		1	4	1		2	1			1	3	2							3	7
8	4		1	1	1			2							1		1				4	8
9	6	1			1			1				1									2	9
10	1																					10
11	1																				1	11
12																		1				12
13																						13

Level	Meta-volcanics							Unid.	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE					
1							4			1		1
2								4				2
3							1					3
4							3					4
5							7	1				5
6							4	5	1			6
7							3	1				7
8	1						3					8
9				1			5					9
10							5					10
11							2					11
12												12
13												13

Table 1-2. Temporal and functional diagnostics from Block A, Unit 2.

Level	Quartzite							Quartz							Chert/Jasper							Level
	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	DE	
1	1							1														1
2	1				2	1		1													4	2
3	2	2			1	1																3
4	8				5	1	4														4	4
5	10				7	1		1				1		1								5
6	6	1			10		1	1	2			1									3	6
7	14	1			4	2		3													1	7
8	12	1			12	1		1			1										6	8
9	14			3		1		5	1												2	9
10	4	2			1			2			1	2		1							1	10
11	1	2		1	4	1		4	1												1	11
12	3			1		1															2	12
13								1														13
14								1														14
15+	1							2														15+

Level	Meta-volcanics							Unid.	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE					
1							1		1		3	1
2							5				2	2
3	1						16	1			2	3
4							2		15		1	4
5	2						9					5
6							15	2			1	6
7							15	2				7
8	1						23	4				8
9	1						14					9
10							7					10
11							5	1				11
12							4			1		12
13							2					13
14							1	1				14
15+	2						2					15+

Table 1-3. Temporal and functional diagnostics from Block A, Unit 3.

Level	Quartzite							Quartz							Chert/Jasper							Level
	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	DE	
1	1					1		1														1
2	1																					2
3	1				3	1	1	1														3
4	16	1		3	3	1	1	8			3	1									1	4
5	13			4		2		8				1										5
6	9	5		3	3			8	3		1	1									6	6
7	6	4		2	4		2		1	1	4		1		1		1	1			2	7
8	5	5		1	1		2	7	1		1	1		3							3	8
9	3			2	1	1															1	9
10	2							1	1												1	10
11															1						4	11
12																						12
13																						13

Level	Meta-volcanics							Unid.	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE					
1												1
2												2
3							7	3				3
4							5					4
5							5					5
6						1	20					6
7							19	1				7
8					1		32					8
9	1						15					9
10							18					10
11							4					11
12							1					12
13							2					13

Table 1-4. Temporal and functional diagnostics from Block A, Unit 4.

Level	Quartzite							Quartz							Chert/Jasper							Level
	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	DE	
1																						1
2																						2
3																						3
4	15	1			3																	4
5	16	2			6			1														5
6	6	1		1	3																	6
7	8	1		2			1	3	1			1	1									7
8	15	2		1	2			1														8
9	6	1		1	1			3				1			2							9
10	10	5		1	3			10	3						1						1	10
11	6	6		1	1			4											1			11
12	2								1												1	12
13					2			4				1		1							2	13

Level	Meta-volcanics							Unid.	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE					
1												1
2												2
3											1	3
4							2	7			7	4
5							3				3	5
6							1		1			6
7							1					7
8							1					8
9							4					9
10												10
11							1	4		1		11
12												12
13												13

Table 1-5. Temporal and functional diagnostics from Block A, Unit 5.

Level	Quartzite							Quartz							Chert/Jasper							Level
	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	DE	
1																						1
2																						2
3	5				2			2													1	3
4	17	3			1			2					1									4
5	13				1		2	1	1					2							2	5
6	18				3	2		5			1										2	6
7	17	2		3	8		1	4				1									2	7
8	16	5	1	1	7		1	9	3			2			1						1	8
9	15	1			7			7	5		1	1									2	9
10	8	1			2	1		6													4	10
11	10			1	2			3						1	1						2	11
12		2	1	1				1		1					1							12
13	2																					13

Level	Meta-volcanics							Unid.	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE					
1												1
2												2
3											3	3
4												4
5							2	1			1	5
6							1	4		1		6
7							2					7
8							2			1		8
9							4					9
10							3					10
11							5					11
12								1				12
13												13

Table 1-6. Temporal and functional diagnostics from Block A, Unit 6.

Level	Quartzite							Quartz							Chert/Jasper							Level
	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	DE	
1																						1
2																						2
3																						3
4	3	2																			1	4
5	4								1													5
6	8				1	1		2														6
7	7	1		1	7			1														7
8	12	1			6	1		7														8
9	13	5		3	4			3	2												2	9
10	14	1			3			1			1										1	10
11	10	2		2	2	2			1			1		1								11
12	3	2				1		2														12
13	3	1						2	1												1	13
14	2							2	1													14
15	1							1														15

Level	Meta-volcanics							Unid.	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE					
1												1
2												2
3												3
4											5	4
5								2			10	5
6											1	6
7												7
8												8
9							2					9
10							1	1				10
11	1							2				11
12							1	1				12
13							1					13
14							1					14
15	1											15

Table 1-7. Temporal and functional diagnostics from Block A, Units 8 and 9.

Unit 8

Level	Quartzite							Quartz							Ceram-	Level
	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	BP	ics	
1																1
2																2
3																3
4	1				1										2	4
5																5
6	10	2			3	2		1							8	6

Unit 9

Level	Quartzite							Quartz							Chert/Jasper							Level
	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	DE	
PZ				1	1	1		1					1									PZ
1	2				1							1										1
2	1				1			1														2
3	6	1			1			1														3
4	5							3					1								8	4
5	2	1		1	1		1	1	1												2	5
6	4			1	2	1		1	2		2			3							7	6
7	3	2		2	2			2					1								4	7
8	6		1	1	6		3	5			1	1									7	8
9	3	1			2			3	1					1	1			1			5	9
10	1	1		1	1			1	1								1				7	10
11																					1	11
12																					1	12
13																					6	13
14																						14

Level	Meta-volcanics							Unid.	Slate	Ortho- qrtzt	Ceram- ics	Level
	MW	PP	SP	UF	BI	PT	DE					
PZ						2					14	PZ
1											1	1
2							1					2
3						1	2		1		4	3
4								1				4
5							8					5
6							6					6
7							7	2				7
8							6					8
9							5	1				9
10							7					10
11							8					11
12							3					12
13												13
14												14

Table 1-8. Temporal and functional diagnostics from Block A, Units 12 and 13.

Unit 12

Level	Quartzite							Quartz							Chert/Jasper							Level
	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	DE	
1	6																					1
2	8	4	1		4			5														2
3	3	2			1	1		1					1									3

Level	Meta-volcanics							Unid.	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE					
1	1						1					1
2							2					2
3								2				3

Unit 13

Level	Quartzite							Quartz							Chert/Jasper							Level
	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	DE	
1	3							1														1
2	4	2			1	1		2														2
3		1			10	1			3			1									2	3
4	6		1		1								1	1								4
5	6	2			3	1	1								1						3	5
6	5						1	3			1									1		6
7	6			2				4					1									7
8	1				1		1	2												1		8

Level	Meta-volcanics							Unid.	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE					
1												1
2												2
3												3
4								1				4
5												5
6												6
7												7
8								1				8

Table 1-9. Temporal and functional diagnostics from Block A, Unit 14.

Level	Quartzite							Quartz							Chert/Jasper							Level
	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	DE	
1	5				6	2	1						1									1
2	2	1		1	2	2		1			3										3	2
3	7	2		1	1	1		2				1		1							3	3
4	6	3		3	12	4		11	1		3	2						1				4
5	7			2	5			1				2		1				1			7	5
6	2	2		4	5	1				1	2			5	1			2			6	6
7	6			2	1				1		1						1				4	7
8					1			1			1	1	1					1			4	8
9	1				1													1			1	9
10	2																				1	10

Level	Meta-volcanics							Unid.	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE					
1												1
2							4					2
3							2					3
4	1						7	5				4
5							6	3				5
6						1	9	1				6
7							8	1				7
8							5					8
9						1	2					9
10							1					10

Table 1-10. Temporal and functional diagnostics from Block A, Unit 15.

Level	Quartzite							Quartz							Chert/Jasper							Level
	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	BP	MW	PP	SP	UF	BI	PT	DE	
1-3	1				2	1						2		1								1-3
4	1			1	1						1			2								4
5	2	1		1	3			4	2													5
6	3	1		2		2	1	1			1		1								1	6
7	3	1							1		1			1	1						3	7
8	3			2	1																1	8
9	2																					9
10								1													1	10

Level	Meta-volcanics							Unid.	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE					
1-3												1-3
4						1	3					4
5							3					5
6						1	5					6
7							9	1		1		7
8				1			4					8
9							1					9
10												10

Table 1-11. Artifacts from Block B, Unit 16.

Level	Quartzite									Quartz								Level
	FR	DE	MW	PP	SP	UF	BI	PT	BP	FR	DE	MW	PP	SP	UF	BI	PT	BP	
PZ	94	810	2	1				1		65	76	1			1				PZ
1	77	662	8				1			49	34	2							1
2	78	784	14				1	5	2	49	40					1		2	2
3	172	1431	9	1			3	5		83	67	3							3
4	164	1415	32			3	4	2	1	63	97	4			1				4
5	170	1709	48				8	3		75	129	11	3			1		1	5
6	134	1540	33	6	1	5	8	5	2	60	133	8	1	1	1	1		2	6
7	82	1564	25	5	5	8	4	2	2	32	119	17		1	2		1	2	7
8	28	881	17	2		3	3			6	71	1	3						8
9	5	571	3	1		1	1	1		7	27								9
10	3	301	2							2	21	2							10
11	2	139	4							3	4	1							11
12		24									2								12
13	1	59				1					4								13
14		1																	14

Level	Chert/Jasper							Meta-vol.							Unid.	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE	MW	PP	SP	UF	BI	PT	DE					
PZ														7	2			1	PZ
1							1							5			1		1
2						1								3	2		1		2
3							1		2				1	12	6				3
4					1		7							14			1		4
5	1						5							18	3	1	1		5
6	1						10		1					23	7		2		6
7							14		1		1			25			2		7
8							11		2		1			16			2		8
9							8							10	1		4		9
10							6							4	2				10
11														2			1		11
12							1							3			1		12
13														2			1		13
14																			14

Table 1-12. Artifacts from Block B, Unit 17.

Level	Quartzite									Quartz									Level
	FR	DE	MW	PP	SP	UF	BI	PT	BP	FR	DE	MW	PP	SP	UF	BI	PT	BP	
1	29	431	2		3		2			14	25								1
2	88	671	4		1		1	1		17	30	3	1	1	1				2
3	70	680	4		1					26	45	3					1		3
4	113	893	8		1	1	2	2		61	55	2						1	4
5	144	1287	15	4		3	12	1		48	79	9	3				1		5
6	88	1276	19	3		4	4	4	4	44	68	11						2	6
7	23	867	8	2	1		4	2	2	20	69	5	4	1					7
8	13	670	9	1	3	3	5	1	3	16	45	3	3					1	8
9	12	534	7		1	1	1	2		2	27	1							9
10	1	293	1			1				4	18	1					1		10
11	4	136			1					8									11
12		56								1	2								12
13	1	25																	13

Level	Chert/Jasper							Meta-vol.							Unid.	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE	MW	PP	SP	UF	BI	PT	DE					
1														3		1			1
2							6							2		1			2
3							1	2						2			1		3
4							4							3					4
5							3	4						11	1				5
6							2					1		5	6		1		6
7							1							2	3				7
8							2							6			1		8
9					1		1	2						5					9
10														2					10
11	1																		11
12	1																		12
13																			13

Table 1-13. Artifacts from Block C, Unit 19.

Level	Quartzite									Quartz									Level
	FR	DE	MW	PP	SP	UF	BI	PT	BP	FR	DE	MW	PP	SP	UF	BI	PT	BP	
PZ	83	257	3		3		1			45	88	5							PZ
1	22	145								17	24							1	1
2	30	187					1	1		22	35	3	1					3	2
3	51	288	6				1		1	31	48	3	1					1	3
4	150	418	6	1		2	2			68	99	1	2	1		1		1	4
5	221	598	13	1	1	1	4			98	138	6	2	2	1			2	5
6	239	626	21	3	2		7	1	1	141	157	13	5		1			6	6
7	142	829	17	1	6	7		1	2	91	215	14		3	3	2		1	7
8	76	863	11	2	4		3		1	61	210	18	3		1			5	8
9	74	831	15	2	4		4	1		31	175	5	1	3	5	2		6	9
10	25	557	8	2	1	1	3	1	1	20	120	2	4	1		1		1	10
11	9	374	6			1	2			5	74	5	2		1			4	11
12	3	222	3				2			1	30			1	3				12
13	3	103		1						3	23							1	13
14		42								1	7	1							14
15	2										6								15

Level	Chert/Jasper							Meta-vol.							Unid.	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE	MW	PP	SP	UF	BI	PT	DE					
PZ	1						5							2	3			20	PZ
1																		4	1
2														1				3	2
3														4				4	3
4														8				1	4
5	1						1							16	2			1	5
6							2							15					6
7							2	1	3					26	1				7
8							2						1	34	1				8
9	1						12	1			2			36					9
10	1						7			1				27					10
11							12	1						14					11
12							4							9					12
13							3							5					13
14							1							2					14
15																			15

Table 1-14. Artifacts from Block C, Unit 20.

Level	Quartzite									Quartz								Level
	FR	DE	MW	PP	SP	UF	BI	PT	BP	FR	DE	MW	PP	SP	UF	BI	PT	BP	
PZ	70	359	2						1	38	53								PZ
1	13	49								3	14								1
2	20	119	2					2		12	14								2
3	33	268	3				1		1	32	39	3							3
4	63	407	1		1					41	63	5						2	4
5	146	726	11	1			2			72	98	7		1					5
6	121	805	9	3			3	2		65	108	5		2		1			6
7	93	978	16	3	3		5	1		51	152	6		2				1	7
8	47	1640	24	1		1	3	1	4	64	167	8	3		2			5	8
9	21	1046	11	2		1	2			14	73	7			2	1		7	9
10	10	1122	22	3		1	10			6	57	2	1		1			2	10
11	2	832			3		2	2		9	24								11
12	2	431	8		1		1	1		1	17	1							12
13	4	204									7	2						1	13
14	2	70									1								14
15		28									3								15

Level	Chert/Jasper							Meta-vol.							Unid..	Slate	Ortho-qrtzt	Ceram-ics	Level
	MW	PP	SP	UF	BI	PT	DE	MW	PP	SP	UF	BI	PT	DE					
PZ														7				23	PZ
1														1					1
2												1		1	1			3	2
3								1										4	3
4								1						4	1				4
5														6	1				5
6							1	1						11	1				6
7												1		11	2				7
8							2							11					8
9							1							15	2				9
10							12	1	1					8					10
11							5							2	1				11
12							5							4					12
13																			13
14																			14
15																			15

ATTACHMENT 2

Idealized Unit Profiles

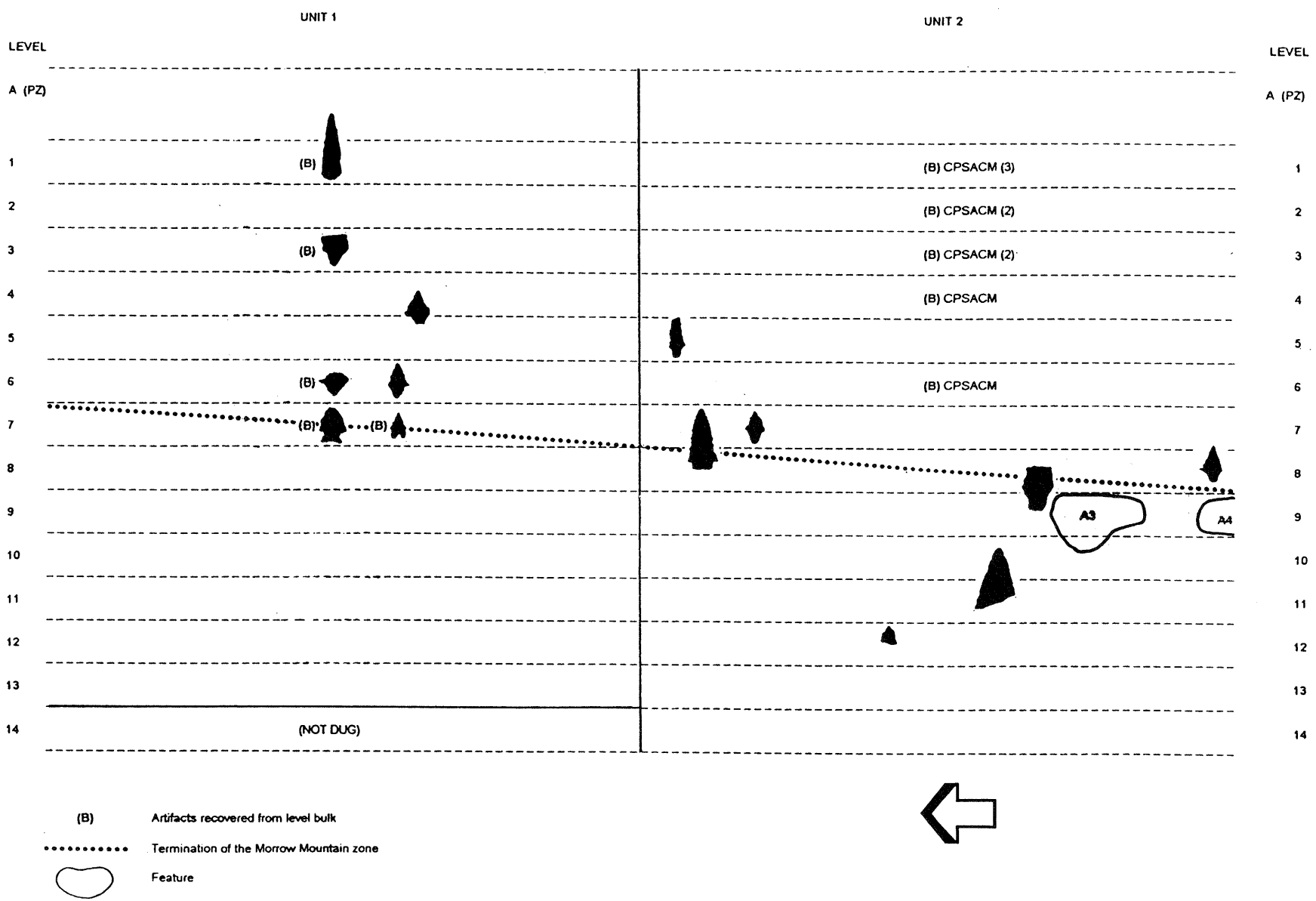


Figure 2-1. Idealized profile of Block A, Units 1 and 2 showing relative positions of diagnostic artifacts and features.

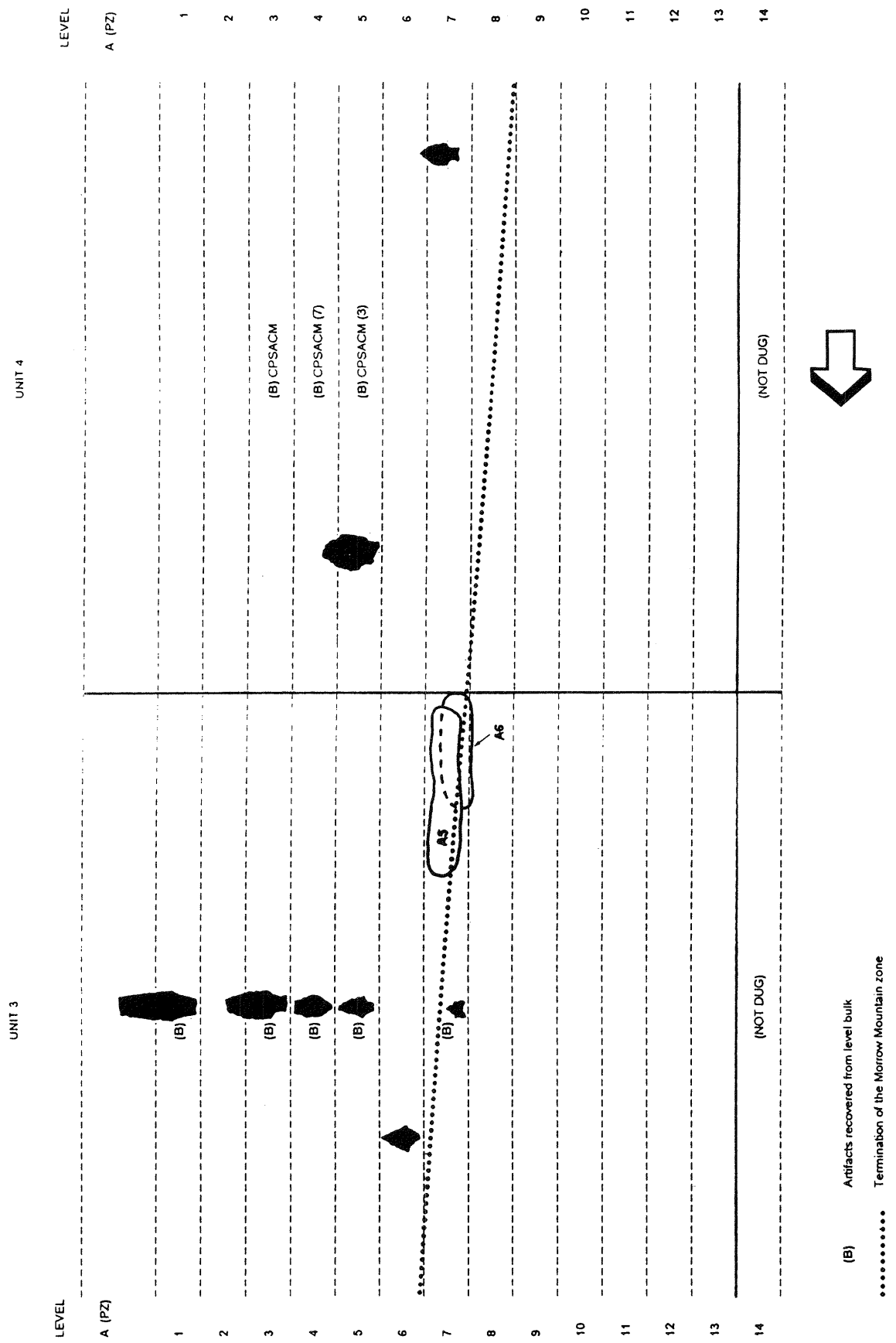


Figure 2-2. Idealized profile of Block A, Units 3 and 4 showing relative positions of diagnostic artifacts and features.

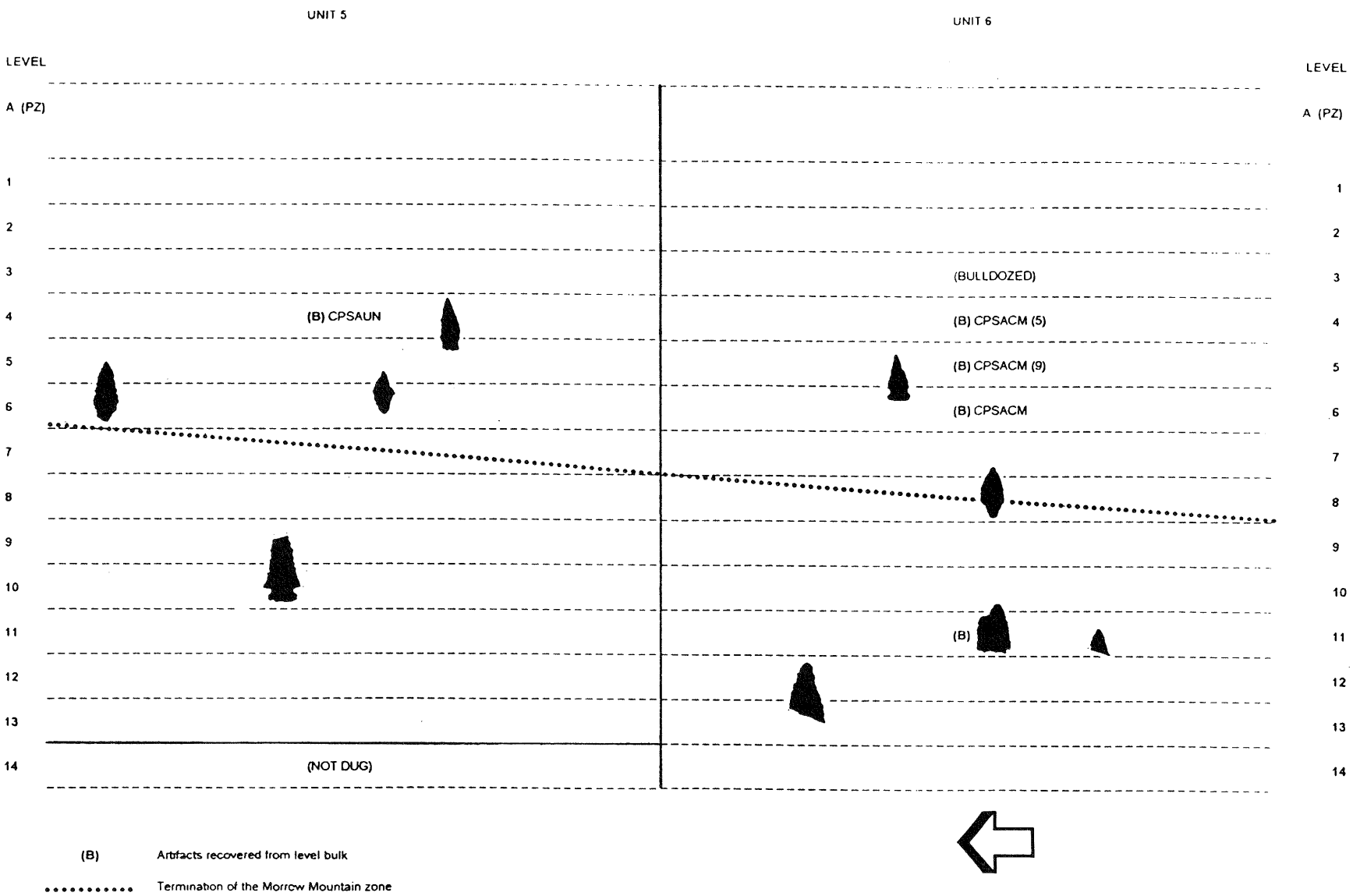


Figure 2-3. Idealized profile of Block A, Units 5 and 6 showing relative positions of diagnostic artifacts and features.

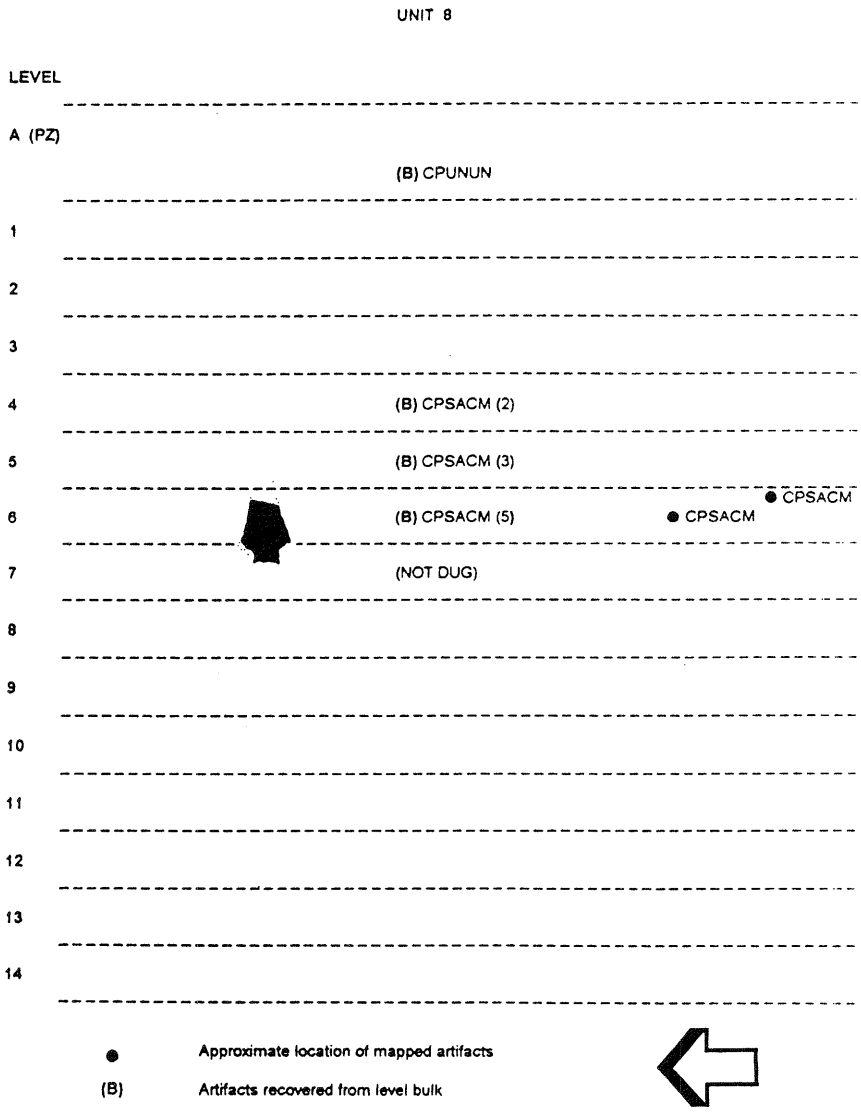


Figure 2-4. Idealized profile of Block A, Unit 8 showing relative positions of diagnostic artifacts and features.

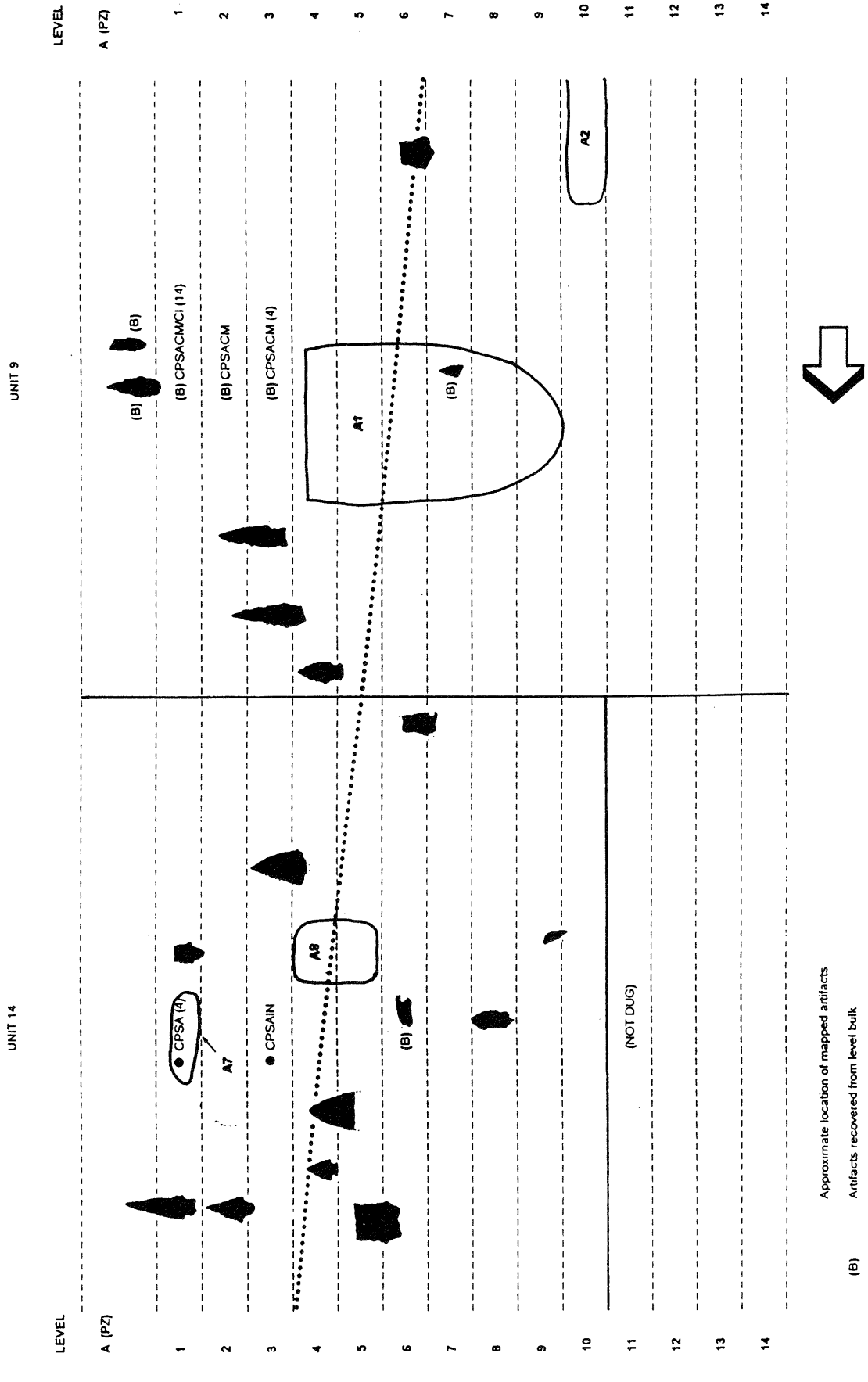


Figure 2-5. Idealized profile of Block A, Units 9 and 14 showing relative positions of diagnostic artifacts and features.

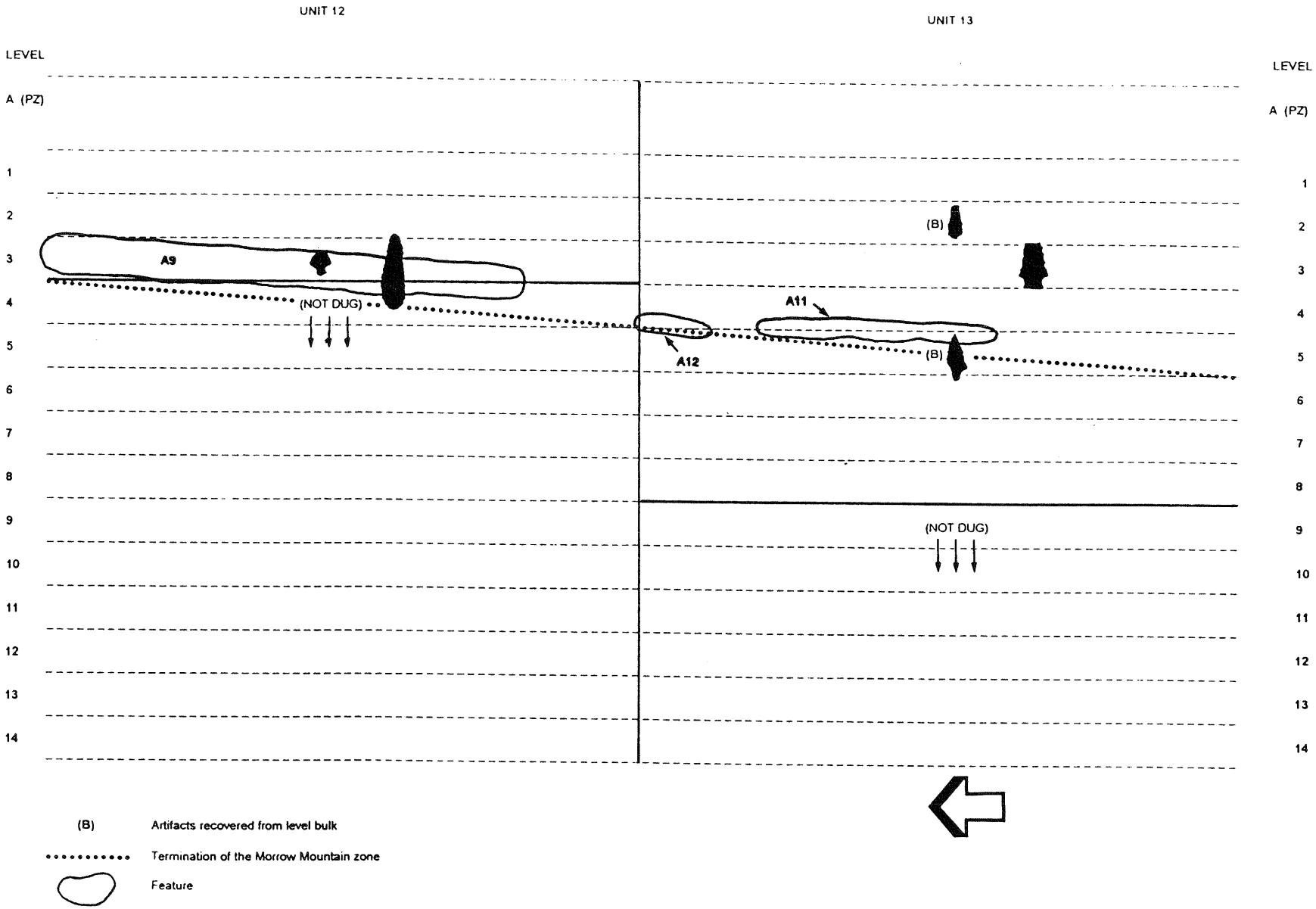


Figure 2-6. Idealized profile of Block A, Units 12 and 13 showing relative positions of diagnostic artifacts and features.

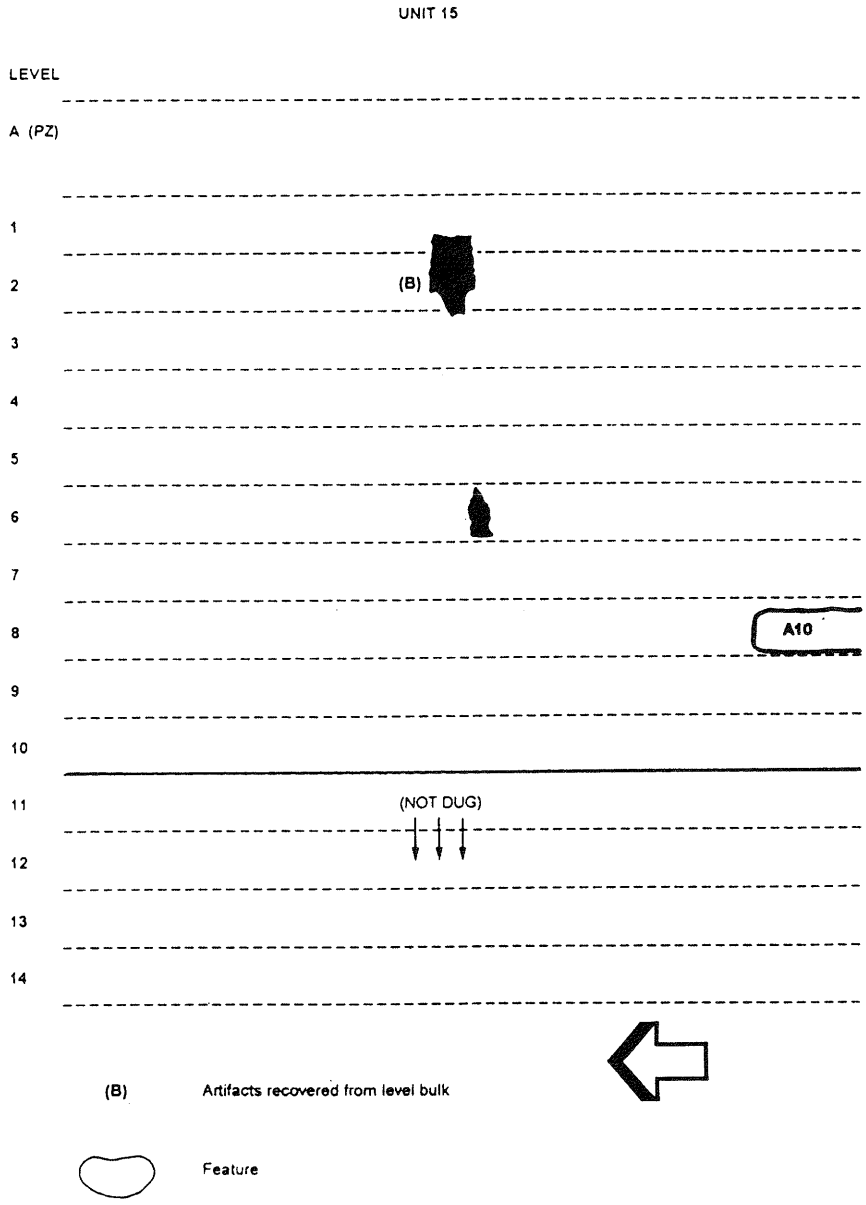


Figure 2-7. Idealized profile of Block A, Unit 15 showing relative positions of diagnostic artifacts and features.

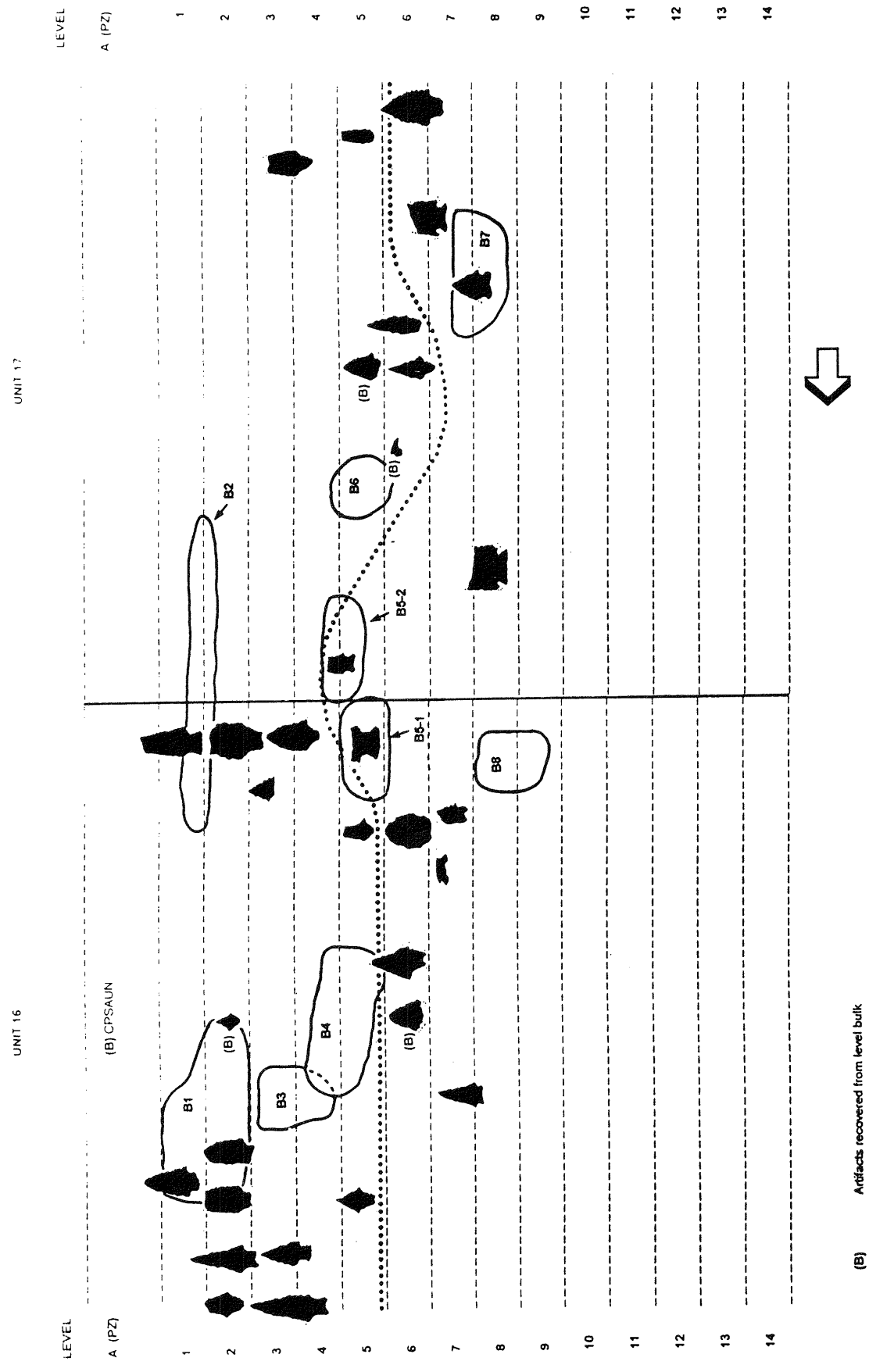


Figure 2-8. Idealized profile of Block B, Units 16 and 17 showing relative positions of diagnostic artifacts and features.

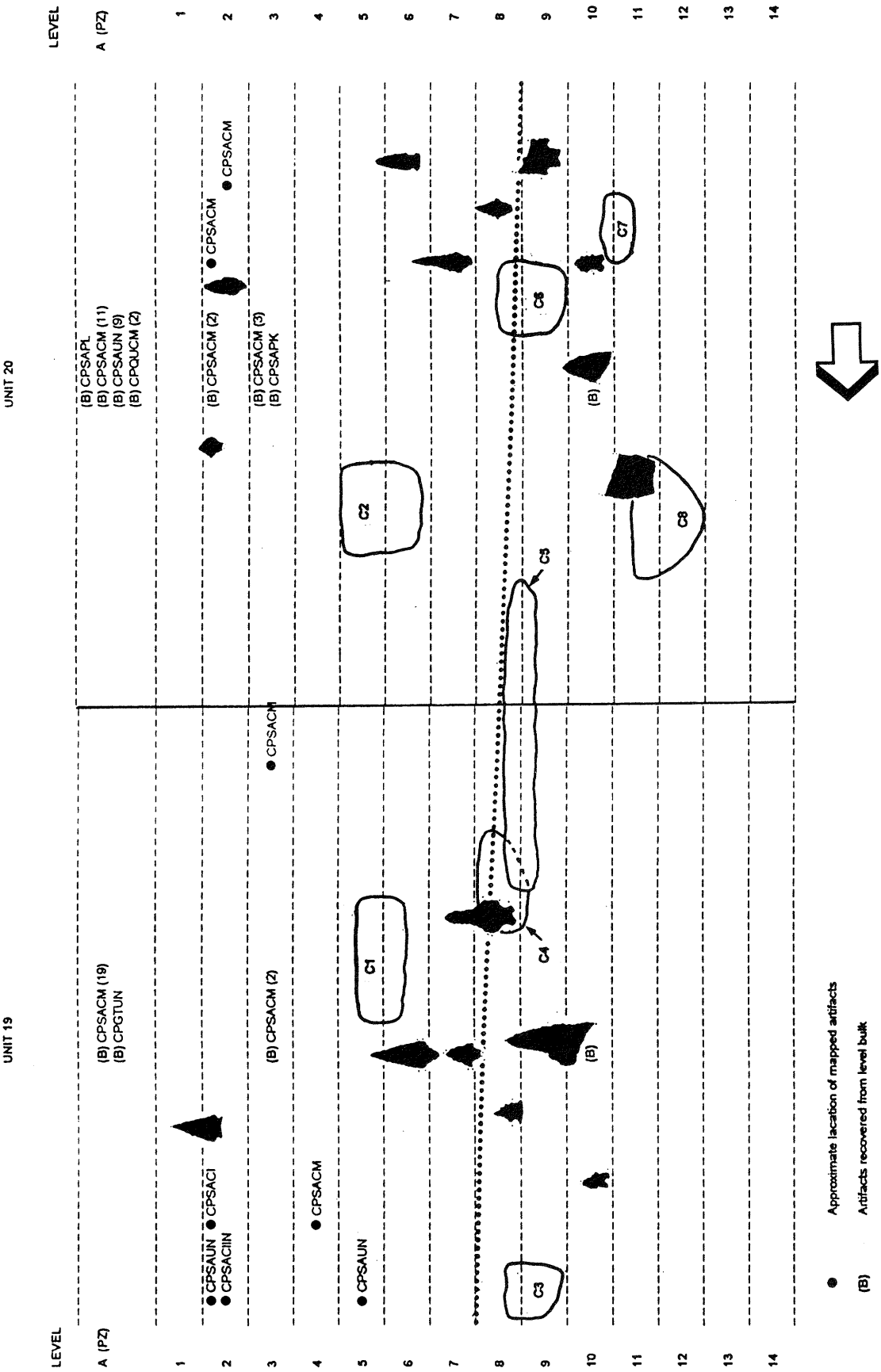


Figure 2-9. Idealized profile of Block B, Units 19 and 20 showing relative positions of diagnostic artifacts and features.

ATTACHMENT 3

Particle Size Analysis Tables

Table 3-1. Particle size data from selected features and artifact pedestals in Block A (weight in grams over percent of sample).

Sample			U.S. Bureau of Standards mesh size							
EU	LEV	FEA	6	20	40	60	100	230	230+	Total
12	3	A9	.1 0	1.3 0	134.6 44	120.5 40	39.7 13	4.7 2	3.6 1	304.5
9	4	A1	.1 0	.2 0	21.6 26	46.5 59	7.6 10	1.4 2	1.0 1	78.4
13	4	A12	0 0	1.2 1	86.4 41	102.3 48	14.3 7	4.4 2	3.1 1	211.7
3	7	A5	21.2 20	25.6 24	17.4 16	29.4 28	6.4 6	2.5 2	3.0 3	105.5
3	7	A6	9.0 7	24.3 19	45.7 35	36.7 28	7.4 6	3.2 2	3.1 2	129.4
15	8	A10	0 0	.5 0	102.9 53	72.5 37	12.2 6	3.4 2	2.0 1	193.5
2	9	A3	.6 0	1.8 0	197.9 35	303.8 53	44.7 8	12.9 2	6.7 1	568.4
2	9	A3	.1 0	1.2 0	164.8 46	158.0 44	20.6 6	6.2 2	4.7 1	355.6
2	9	A4	.1 0	.9 0	73.5 27	155.8 57	24.2 8	8.5 3	8.2 3	271.2
9	9	0	0 0	.5 0	43.3 29	87.6 60	11.5 8	3.4 2	2.3 2	148.6
9	9	0	0 0	.2 0	15.2 26	35.8 61	5.6 9	1.5 3	.8 1	59.1
5	10	0	0 0	.2 0	16.3 23	43.3 62	7.5 11	1.4 2	1.7 2	70.4
9	10	A2	.3 0	1.9 0	160.3 26	387.9 63	48.7 8	13.1 2	2.9 5	615.1
2	12	0	0 0	.2 0	11.5 25	27.1 59	4.8 10	.9 2	1.7 2	46.2

Table 3-2. Particle size data from column sample along the north wall of Unit 16 in Block B (weight in grams over percent of sample)

Sample Depth in Inches	U.S. Bureau of Standards mesh size 6	20	40	60	100	230	230+	Total
0-2	.2	.8	27.3	51.3	8.2	6.5	3.9	98.2
	0	1	28	52	8	7	4	
2-4	.2	.6	26.9	44.6	10.4	3.5	3.7	89.9
	0	1	30	50	12	4	4	
4-6	0	.4	23.1	39.5	8.0	4.0	3.3	78.3
	0	0	30	50	10	5	4	
6-8	0	.5	29.8	49.3	8.5	3.5	3.8	95.4
	0	0	30	52	9	4	4	
8-10	.4	.7	40.1	68.7	11.6	4.8	3.8	130.1
	0	0	31	53	9	4	3	
10-12	.1	.5	33.9	62.2	12.2	3.4	2.0	193.5
	0	0	29	54	10	4	3	
12-14	4	.7	46.2	88.0	13.9	4.5	2.6	156.3
	0	0	30	56	9	3	2	
14-16	.2	.8	40.3	90.7	15.2	6.2	5.1	158.5
	0	0	25	57	10	4	3	
16-18	.4	.7	32.3	66.5	9.9	3.3	3.3	116.4
	.0	1	28	57	8	3	3	
18-20	.5	.9	57.4	89.9	13.9	4.5	4.4	148.6
	.0	.0	33	52	8	3	3	
20-22	.1	.9	59.7	87.6	15.4	4.5	3.9	172.1
	0	0	35	51	9	3	2	
22-24	.3	.8	51.5	88.0	13.3	3.8	3.0	160.7
	0	0	32	55	8	2	2	
24-26	0	1.1	53.3	98.1	15.1	3.8	4.0	175.4
	0	1	30	56	9	2	2	
26-28	0	.9	54.9	81.5	10.2	2.6	1.4	151.5
	0	1	36	54	7	2	1	

28-30	0 0	1.2 1	66.5 32	119.3 57	16.5 8	3.6 2	2.5 1	209.6
30-32	0 0	1.1 1	59.8 31	108.3 56	16.4 9	3.2 2	2.8 2	191.6
32-34	.1 0	1.2 1	66.9 42	76.0 48	11.9 7	2.2 1	1.8 1	160.1
34-36	0 0	.8 0	54.8 36	81.1 54	11.0 7	1.9 1	1.7 1	151.3
36-38	0 0	1.0 1	68.2 39	80.9 51	11.4 7	1.8 1	1.3 1	159.2
38-40	0 0	1.0 0	59.8 33	103.0 56	17.4 10	2.4 1	2.7 2	183.6
40-42	0 0	1.2 1	53.2 31	95.0 55	18.0 10	2.4 1	2.1 1	171.9
42-44	0 0	1.2 1	66.8 33	112.1 56	16.9 8	2.5 1	1.7 1	158.5
44-46	0 0	1.0 1	61.1 38	81.9 51	13.1 8	1.5 1	1.0 1	159.5
46-48	.1 0	.8 0	53.2 36	79.2 53	14.6 10	1.3 1	.7 0	149.9
48-50	0 0	.6 0	54.9 34	88.4 54	15.9 10	1.5 1	.8 0	162.1

Table 3-3. Partical size data from column sample along the east wall of Unit 20 in Block C (weight in grams over percent of sample)

Sample Depth	U.S. Bureau of Standards mesh size							
in Inches	6	20	40	60	100	230	230+	Total
0-2	0	.7	35.8	57.0	12.8	7.2	4.0	117.5
	0	1	30	48	11	6	3	
2-4	0	.6	31.4	64.3	10.7	7.2	4.8	119.0
	0	0	26	54	9	6	4	
4-6	0	.9	49.9	79.0	10.5	9.2	4.4	153.9
	0	1	32	51	7	6	3	
6-8	.2	1.0	70.9	86.3	13.9	8.5	6.4	187.2
	0	0	43	46	7	4	3	
8-10	.1	1.0	72.3	81.0	12.2	5.9	3.2	130.1
	0	1	41	46	7	3	2	
10-12	0	1.0	64.8	80.5	11.5	4.4	5.1	167.3
	0	1	39	48	7	3	3	
12-14	.1	1.0	80.1	77.5	11.9	3.9	3.9	178.4
	0	1	45	43	7	2	2	
14-16	.3	.9	58.6	83.3	10.9	5.0	3.8	162.8
	0	1	36	51	7	3	2	
16-18	0	.8	49.7	69.6	11.5	3.4	3.0	138.0
	0	1	36	50	8	2	2	
18-20	.1	1.0	52.0	85.4	13.3	3.6	4.5	159.9
	0	1	32	53	8	2	3	
20-22	.1	1.0	54.1	62.6	9.5	2.9	2.6	132.8
	0	1	41	47	7	2	2	
22-24	.1	.9	73.8	69.0	7.4	2.3	2.1	155.6
	0	1	47	44	5	2	1	
24-26	0	.9	67.1	69.3	7.2	3.0	2.3	149.8
	0	1	45	46	5	2	2	
26-28	.1	1.1	61.0	71.5	10.7	2.5	2.3	149.2
	0	1	41	48	7	2	2	

28-30	0 0	.8 1	50.3 36	72.0 51	10.0 7	3.4 2	3.6 3	140.1
30-32	0 0	.7 1	35.7 32	62.5 55	8.9 8	2.6 2	3.0 3	113.4
32-34	0 0	.7 1	42.7 36	62.5 53	7.2 6	2.0 2	2.1 2	117.2
34-36	0 0	.9 1	59.7 46	56.5 44	9.0 7	1.9 2	2.0 2	130.0
36-38	0 0	1.0 1	53.2 40	67.6 50	9.1 7	1.6 1	1.7 1	134.2
38-40	.3 0	1.2 1	68.4 45	71.6 47	8.9 6	1.5 1	1.6 1	153.5
40-42	0 0	1.5 1	66.6 45	67.1 46	8.7 6	1.3 1	1.6 1	146.8
42-44	0 0	1.4 1	70.3 45	70.9 46	9.3 6	1.6 1	1.7 1	155.2
44-46	.3 0	1.0 1	59.6 42	69.0 48	9.6 7	1.7 1	1.7 1	142.9
46-48	.1 0	.9 0	69.9 43	78.1 48	10.3 6	2.3 1	2.1 1	163.7
48-50	0 0	.5 0	40.6 33	67.2 55	9.6 8	2.5 2	2.0 2	122.4