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The Ducks Nest Site: A Small Mississippian Site in Warren County, Tennessee

Gerald Wesley Kline
University of Tennessee, Knoxville

To the Graduate Council:

I am submitting herewith a thesis written by Gerald Wesley Kline entitled "The Ducks Nest Site: A Small Mississippian Site in Warren County, Tennessee." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Anthropology.

Charles H. Faulkner, Major Professor

We have read this thesis and recommend its acceptance:

Walter E. Klippel, Gerald F. Schroedl

Accepted for the Council:
Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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Accepted for the Council:

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THE DUCKS NEST SITE: A SMALL MISSISSIPPIAN SITE IN WARREN COUNTY, TENNESSEE

A Thesis

Presented for the

Master of Arts

Degree

The University of Tennessee, Knoxville

Gerald Wesley Kline

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The 1976 and 1977 investigations at the Ducks Nest site were conducted by the Department of Anthropology, The University of Tennessee, Knoxville, under contract with the Tennessee Department of Transportation. Mr. Glyn DuVall, staff archaeologist with the Tennessee Department of Transportation, acted as liaison and his assistance was much appreciated. Members of the 1976 field crew included Merrill Dicks (field assistant), Dan Amick, Mona Butler, Lee Ferguson, Harley Lanham, Robert Pace, and Stephanie Romanosky. The 1977 field crew consisted of Will Hines, James East, Abigayle Robbins, Gary Crites, Merrill Dicks, Harley Lanham, William Holt, and Kay Moneyhun. Both crews are to be commended for their admirable performance under field conditions that were sometimes far from ideal.

Several individuals contributed to the processing and analysis of the archaeological remains recovered at the Ducks Nest site. Will Hines, Harley Lanham, Merrill Dicks, William Holt, Dan Amick, and Robert Pace accomplished the basic washing, sorting, and cataloging of the recovered archaeological materials. Special thanks to Gary D. Crites of the Paleoethnobotany Laboratory at the Department of Anthropology, The University of Tennessee, Knoxville, for analyzing the archaeobotanical remains. Lloyd N. Chapman drafted the figures and Ms. Marian Harper is responsible for typing of the final copy.

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ABSTRACT

Archaeological investigations conducted at the Ducks Nest site (40WR4), situated on a ridge in the Barren Fork drainage in the Eastern Highland Rim of Middle Tennessee, resulted in the excavation of a small Mississippian component consisting of two superimposed wall trench structures and six features. These cultural remains and the artifacts and ecofacts recovered in association are described and discussed. It is concluded that the Ducks Nest site was occupied on a year round basis over a limited number of years during the first half of the twelfth century A.D. by a small social group that was trophically self-sufficient.

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CHAPTER I

INTRODUCTION

In the eastern United States a considerable amount of archaeological effort has been expended toward investigating the cultures of the late prehistoric Mississippian tradition. At present, however, much of our knowledge about Mississippian manifestations is derived from large sites situated in the valleys of major rivers and tributaries. This thesis presents the results of a descriptive analysis of the Ducks Nest site (40WR4)--a small Mississippian site situated on an upland ridge in an interior headwater drainage of the Eastern Highland Rim in Middle Tennessee. The principal goal of this thesis is descriptive documentation. However, the Ducks Nest data also have implications for several issues in contemporary Mississippian archaeology. Following a brief synthesis of the Mississippian Tradition as presently known, the Ducks Nest site will be described in its natural setting and the archaeological remains, consisting of cultural features, lithic artifacts, ceramic artifacts, ecofactual data, and radiocarbon dates will be discussed. In the final chapter this information will be synthesized, compared with similar manifestations, and discussed in relation to available data on Mississippian settlement in the Eastern Highland Rim.

A. The Mississippian Tradition

The stimulus for the development of the Mississippian Tradition and the areas in which this was first manifest remain only vaguely understood. From approximately A.D. 800 until the European contact period, however, the eastern United States, particularly the midwest and southeast, was occupied by Indian groups who had developed or integrated into their cultural systems similar technological, economic, and social traits. Although a definite degree of diversity is exhibited among specific regional manifestations, the term "Mississippian" has generally been employed by archaeologists to refer to a certain way of life; a way of life and a social order that developed with the practice of intensive agriculture. For example, Griffin (1967: 189) uses the term "Mississippian" to refer to "the variety of adaptations made by societies which developed a dependence upon agriculture for their basic, storable food supply." Although there were suggestions (cf. Cleland 1966; Yarnell 1964; 1977) that the development of intensive agriculture had resulted in the sharp truncation of other food procurement subsystems, particularly in the exploitation of a more restricted range of wild plant foods and game, this has not been shown to be true (cf. Smith 1975, 1978; Robison 1978; Shea 1978; Muller et al. 1975). In combination with the continued exploitation of a wide variety of native berries, nuts, herbaceous seeds, fish and game, the cultivation of several varieties of maize, beans, squash, pumpkin, gourd and sunflower provided Mississippian societies with a dependable and ample supply of food. Though it now appears that Mississippian subsistence strategies were different in degree rather than in kind from those practiced by earlier societies, the dependence upon domesticated crops--particularly maize--had far reaching implications.

As initially coined by Holmes (1903) the term "Mississippi" was employed to designate a ceramic tradition and its location--"First in importance among the groups of ware is that called . . . the Middle Mississippi Valley group" (Holmes 1903: 21). This complex of ceramics, in which crushed mussel shell is the principal tempering agent, was much more diversified than earlier complexes. The wide variety of vessel forms produced, and the differing degrees of technological refinement in manufacturing exhibited among them, demonstrate a high degree of functional and stylistic variation. Large cooking jars, storage jars, and simple bowls were the most common utilitarian vessels, but there were also many polished and decorated bowls, effigy bowls, plates, large pans ("salt pans"), and a variety of bottles, including animal and human effigy forms. Although the majority of Mississippian ceramics exhibit plain exterior surfaces, low frequency modes of surface decoration/treatment include cord marking, encising, engraving, and painting--the latter including red film, bichrome, polychrome and negative painting. Another significant characteristic is vessels, predominantly bowls and jars, with loop and strap handles.

Mississippian lithic assemblages are difficult to characterize since few adequate analyses have been reported. Salient constituent lithic artifacts, however, include small triangular chipped stone arrowheads; large chert and limestone hoes; a variety of flake tools including end scrapers, side scrapers, and spokeshaves; bifacially chipped chert knives and adzes; a variety of ground stone artifacts, including manos, grooved and faceted sandstone abraders and celts; and sociotechnic/ideotechnic items such as stone discoidals, zoomorphic and anthropomorphic effigy pipes and gorgets. The level of technological sophistication reflected in most Mississippian lithic assemblages is very high, although many aspects of the specific manufacturing techniques employed are inadequately studied.

In addition to lithics and ceramics, Mississippian assemblages also frequently include artifacts of bone, antler, and shell. These occur as both utilitarian and non-utilitarian items such as bone awls and needles, antler batons, punches and socketed handles, and shell hoes, beads and gorgets.

The last of these highlights an important facet of Mississippian life--extra-regional trade. Large marine gastropods (Busycon) from both the Atlantic and Gulf coasts were traded inland where they were fashioned into containers, beads of various sizes and shapes, mask gorgets, and elaborately engraved circular gorgets. Chert from selected source areas (e.g., the Dover quarries in Stewart County, Tennessee) was also traded and was widely distributed in the form of finished utilitarian implements, status specific ceremonial items, and probably also as dressed blocks of raw material. Mississippian trade, however, was not restricted to shell and chert. Other trade/exchange systems involved copper from the Upper Great Lakes area, salt from saline springs in southern Illinois, Kentucky, and Tennessee, and probably also perishable items which have not been preserved in the archaeological record.

Recently several attempts have been made to gain a better understanding of Mississippian social organization (Brown 1971; Larson 1971;

Peebles 1971, 1974; O'Brien 1977). Peebles (1974: 30-37) provides a good summary and critique of previous statements regarding this problem. He points out that most archaeologists have based their statements about Mississippian social organization upon ethnographic analogies with early historic groups in the Southeast--particularly the Natchez. Although the Natchez analogy, or chiefdom model, may prove to be accurate in certain instances, at present it must be considered a hypothesis (actually a complicated set of hypotheses) which has not been adequately tested against the archaeological record. The basic question that ultimately must be addressed from a variety of independent analytical perspectives is, "What are the material implications of chiefdoms, of ranked societies, of societies that were organized as conical clans?" (cf. Peebles and Kus 1977). Since the present paper does not deal specifically with Mississippian social organization suffice it to summarize this discussion by briefly reviewing the two most recent attempts to approach this problem.

Both Peebles (1974) and O'Brien (1977), although working from different perspectives, found evidence in their respective data sets to support the chiefdom model for Mississippian sociopolitical organization. Peebles analyzed burial data from the Moundville site on the Black Warrior River in west central Alabama from the perspective that "the patterned variations in mortuary ceremonials accorded individuals in a society ought to reflect their positions within the society during their lifetimes" (Peebles 1974: 38). He argued that if the Moundville society was organized as a chiefdom (i.e., a ranked society such as the Natchez--a society in which there are fewer positions of valued status than there are individuals capable of filling them) then there should be two major groups of burials. One group should consist of individuals of all ages and both sexes and should reflect high ascriptive status, as indicated by high cost burial facilities, associated sociotechnic grave goods (i.e., items of dress and symbols of rank and office), and spatial segregation from the remainder of the population. The other major group should contain individuals of all ages and both sexes but should reflect situations of achieved status. This group should be characterized by lower cost burial facilities, technomic as opposed to sociotechnic items as grave goods, and, since age and sex would be the principal controlling factors, a low incidence of grave goods associated with infants and children. The results of Peebles' analysis (1974: 181-191) demonstrate a very close fit between the expected and observed patterns of mortuary ceremonialism. Consequently, at Moundville the chiefdom model of Mississippian sociopolitical organization is supported.

O'Brien (1977) approached the analysis of the archaeological remains recovered at the Mound Bottom site, on the Harpeth River in central Tennessee, also from the perspective of a chiefdom model of sociopolitical organization. He identified eight characteristics of ethnographically reported chiefdoms which have been postulated for Mississippian society and which are potentially identifiable archaeologically: (1) evidence of ranking, (2) improvement of craft specialization, (3) greater population density, (4) greater productivity, (5) large centers, (6) organization and deployment of labor, (7) inequality in areas other than economics, and (8) distinctive regalia for high status individuals. Although issue may be taken with certain of these characteristics, O'Brien finds in the data from Mound Bottom that certain elements of the model are supported. First, there is evidence of craft specialization in the working of shell, mica and copper. Second, from a brief survey of the surrounding area, it is evident that the Mound Bottom site represents the apex in the local Mississippian settlement hierarchy. Third, the site layout indicates a well-planned community of a relatively large and dense population. Fourth, it is argued that the large number of mounds and the presence of a surrounding palisade indicate the coordinated organization of a large work force. Though these observations support the chiefdom model proposed by O'Brien, lacking at Mound Bottom was solid evidence of social ranking. This is possibly the result of sampling error, but is also the result of an overly inclusive initial research design. The case for Mound Bottom, therefore, must be viewed critically, and deemed in need of further testing before it can be accepted.

The topic of Mississippian settlement patterns and settlement systems has been addressed by a number of archaeologists (cf. Larson 1970, 1972; Ward 1965; Griffin 1967; Clay 1976). At present, however, our understanding of Mississippian settlement patterns, and concomitantly settlement systems, is very restricted--despite the amount of Mississippian site archaeology that has been accomplished. A major reason for this is that in the past, and still somewhat true today, archaeologists have been drawn to the larger more complex sites. Sites such as Cahokia, Kincaid, Angel, Moundville, and Etowah have been investigated principally because of the "spectacular" nature of their remains--earthen mounds and mound complexes arranged in a definite orderly fashion, dense concentrations of domestic refuse, and concentrated clusters of human burials frequently with associated exotic artifacts. Unfortunately, more often than not these sites have exhibited complex developmental histories which have taken archaeologists years to only partially unravel. In addition, it has generally been possible to excavate only a small percentage of the total area of these large sites.

Another factor which has limited the understanding of Mississippian settlement, particularly in the Southeast, has been that much archaeological work has been conducted under salvage conditions in conjunction with large federally funded reservoir construction projects. Aside from the inherent difficulties of salvage archaeology, reservoir precincts, and consequently the research universe within which archaeological investigations could be conducted, have been limited to the bottomland zones of major rivers and certain of their larger tributaries. The implications of this situation are apparent. First, immediately adjacent upland biogeographic zones have not been systematically investigated. In those instances where attempts have been made to survey these zones, sites encountered have been inelligible for further investigation under reservoir contract regulations. The result has been a truncated representation of prehistoric settlement. Second, interior areas and low order drainages remain even today archaeological _terra incognita._ Although these areas are now being investigated to a greater extent, much of this work is presently restricted to small tract surveys which have not in most instances been followed up by excavation even at the Phase II level of archaeological testing. Consequently, the archaeological literature on these areas, much of which is generally unavailable, contains a considerable amount of speculation coupled with a modicum of solid substantive data.

What, then, can be said concerning Mississippian settlement patterns and systems? At the intra-site level there is a wide range of variation represented. Sites range in size from very small to very large and in internal structuring from very complex to very simple. With its complex set of earthen mounds and sprawling residential area the site of Cahokia in the American Bottoms represents the largest and most complex prehistoric site in the New World north of Mexico. Similar large settlements were surrounded by protective palisades and/or earth works, inside which were flat-topped earthen mounds supporting buildings that served as council houses, temples and sometimes charnel houses. A variety of residential buildings were constructed but the most frequent types encountered consist of square-rectangular wall trench and single post structures. In accord with the well-planned community pattern of most of these sites there is evidence of residential zoning and also the segregation of dwellings occupied by craft specialists. For example, at Mound Bottom there is evidence that residential structures were not constructed in immediate proximity to the largest mound, and that craft specialists were isolated in an area to the west of Mound A (O'Brien 1977: 464-465).

On the other end of the scale are sites such as the one reported here and the Gypsy Joint site of the southeast Missouri Middle Mississippian Powers phase (Smith 1976, 1978). These sites in contrast to the larger ones are very small, were occupied for a relatively short time by a small social group, and consequently are not complex in their internal structuring.

On the local inter-site level Mississippian settlement patterns are almost invariably characterized by a multi-tiered hierarchical structuring. Unfortunately, the precise nature of this structuring in specific localities has not been adequately investigated. In most cases it appears that the pattern is one of a single large site (principal population center) around which (or usually distributed along a river valley) are distributed several medium-sized sites (lesser centers) and a relatively larger number of small habitation and limited activity loci. Such a pattern entails a minimum of four tiers in the settlement hierarchy.

As noted by Ward (1965), Larson (1970, 1972), and Peebles (1974) there is a strong correlation between the location of Mississippian sites and the distribution of soils which are well-drained, easily workable and fertile--i.e., rich arable agriculturally productive soils. For groups practicing intensive agriculture soil conditions would indeed play an important role in determining where to locate settlements. What initially appeared to be a simple correlation between sites and soils, however, has proven to be much more complex. Larson (1970, 1972) for example, has argued that certain Mississippian sites are located in edge areas or ecotones where the resident populations could exploit a multiplicity of resources and possibly also control the distribution of selected goods. Furthermore, Peebles (1974: 29) has argued that prime hunting land was an important consideration. Consequently, although there is a strong correlation between Mississippian sites and specific soil types, in actuality the situation in any specific instance is "a far more complex problem because population, wild and cultivated resources, and Mississippian cultural systems are all linked together in complicated ways" (Peebles 1974: 29).

The problem of dealing with Mississippian settlement systems, particularly at the local level, has actually only been barely broached in the archaeological literature. One significant omission to date has been that very few small sites representing the lower end of Mississippian settlement systems have been excavated. In fact, the general practice has been to indiscriminantly lump all small Mississippian sites into preconceived categories such as "farmsteads." In what is virtually the only adequate report on a small Mississippian site (the Gypsy Joint site in southeast Missouri) Smith notes that,

> It is unfortunate that the term "farmstead," with its inherent connotations of seasonality of occupation and specific function, has been applied. . . . Such an approach tends to obscure the full range of variation that may quite possibly exist in small single- and double-structure Mississippian sites (Smith 1978: 13).

The Gypsy Joint site was excavated in order to document the role that it played in the Southeast Missouri Powers phase settlement system. Until the present study, no comparable small Mississippian habitation site in Tennessee had been adequately reported.

In the fall of 1977, the opportunity arose, through a contract with the Tennessee Department of Transportation, for the author to excavate a small Mississippian site on the Barren Fork River in Warren County, Tennessee. The purpose of this thesis is to describe the Mississippian component present at the Ducks Nest site (40WR4) and attempt to determine the role that this site played in the local Mississippian settlement system. As the Barren Fork drainage is virtually untouched archaeologically it is hoped that the present effort will not only contribute to our understanding of small Mississippian sites but will provide a basis for guiding future research in the area. The strategy of excavating small sites prior to excavating larger ones has been the exception rather than the rule in archaeology. This is unfortunate since, as recollected by Binford,

> . . . large complicated archaeological sites are very difficult to understand. I generalized this observation into a field strategy which I later implemented, namely, dig the little, simple sites first. What you learn from them might permit you to intelligently dig the big, complicated ones (Binford 1972: 130).

CHAPTER II

THE DUCKS NEST SITE ENVIRONMENTAL CONTEXT

A. Location

The Ducks Nest site (40WR4) is located in Warren County, Tennessee, at 35°39'43" north latitude and 85°49'05" west longitude, approximately two miles southwest of McMinnville (U.S.G.S. McMinnville, Tennessee Quadrangle, 7.5' series, 1953). It is situated on a ridge, maximum elevation 963' AMSL, aligned approximately N 24° W which is surrounded on three sides (north, east, and west) by a tight bend in the north-easterly flowing Barren Fork River (Figure 1). In this area the Barren Fork is a shallow, swiftly flowing river which is deeply incised into solid limestone bedrock. As a consequence, on the western slope of the ridge erosion has produced an abrupt bluff which drops approximately 50 feet in elevation to the present river level. A small natural spring is present on this western bluff. As the river winds its way around the bend this bluff decreases rapidly until due north, and extending around the eastern perimeter of the ridge, an area of low terrace topography (900-910' AMSL) has developed. On the outer bend opposite these terraces is another steep bluff. Although the ridge upon which the Ducks Nest site is situated falls off rapidly to the north, east, and west, to the south is a flat expanse of land which is pock-marked with numerous sinkholes.

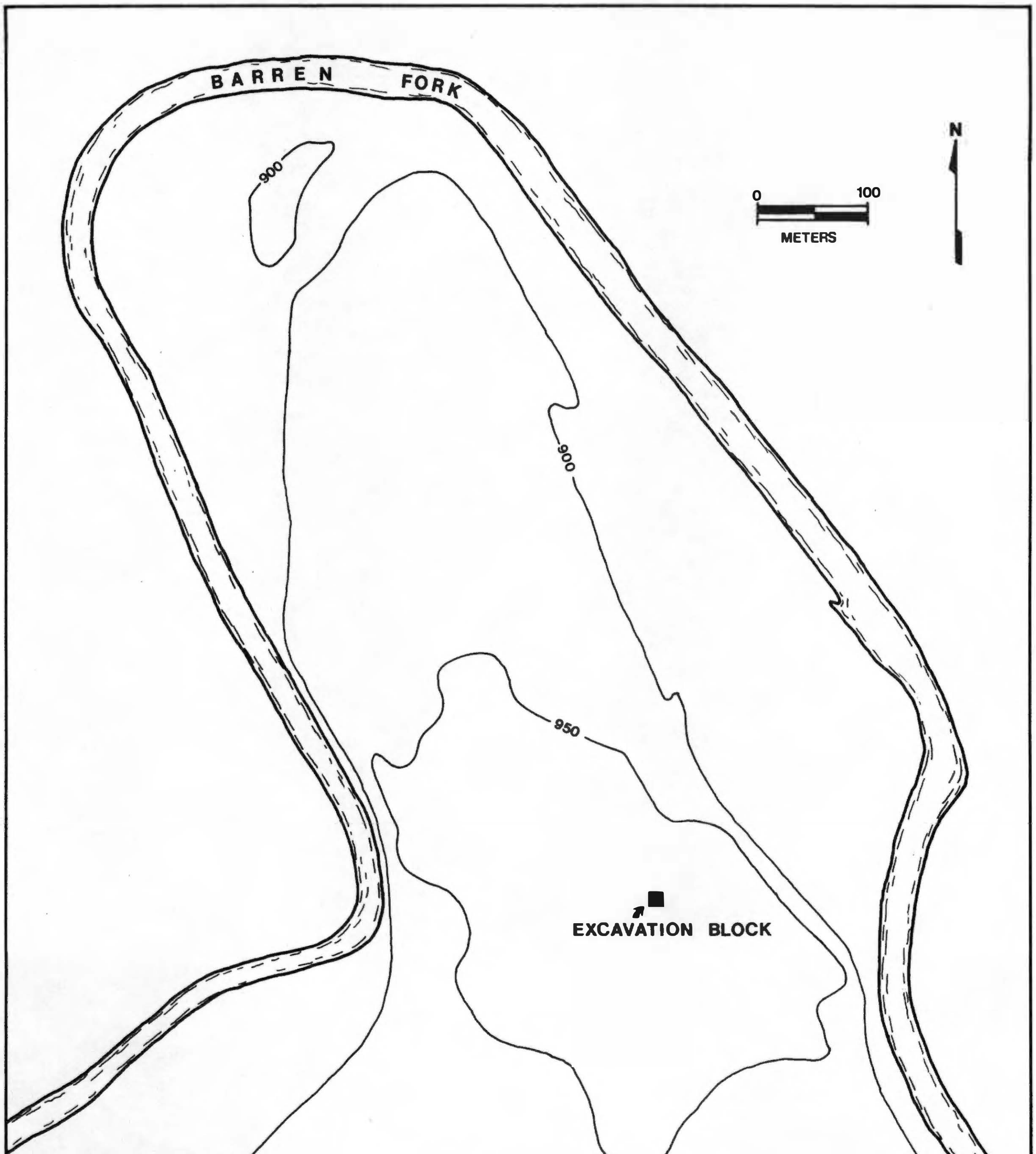

FIGURE 1. Ducks Nest site locality map.

Except for small parcels of forest to the west and north, the ridge and adjacent terraces are presently in cultivation. In the past, however, this land has been used principally as pasture for grazing cattle. Approximately around the turn of the century the forest vegetation was cleared and the land was opened for cultivation. In the mid-1940's, however, it was established as permanent pasture and remained as such until 1977 when it was once again opened for cultivation.

The Ducks Nest site takes its name from the landmark identification on the U.S.G.S. topographic map of the sharp bend in the Barren Fork River immediately north of the site (U.S.G.S. McMinnville, Tennessee Quadrangle, 7.5' series, 1953). Discussions with local residents indicate that this term does not necessarily, as one might logically assume, refer to a place where ducks nested or rested on their migratory flights across this portion of Middle Tennessee. Instead, it is apparently a local colloquialism used to refer to any of a number of sharp confining bends in the rivers and creeks of the area. For example, the sharp bends in the Barren Fork River west of McMinnville are locally referred to by consecutive number as one progresses further away from that town--the bend at the Ducks Nest site being referred to as the "second" Ducks Nest.

B. Physiography, Geology, and Hydrology

The location of the Ducks Nest site places it firmly within the dissected portion of the Eastern Highland Rim physiographic section of the Interior Low Plateaus physiographic province (Fenneman 1938). A plateau or bench approximately 25 miles wide, the Eastern Highland Rim of Middle Tennessee separates the Nashville Basin on the west from the Cumberland Plateau on the east. Topographically this portion of the Eastern Highland Rim is quite variable in relief, although it may be generally characterized as a rolling to hilly plain with sharply incised V-shaped valleys and isolated prominences of higher elevation representing erosional remnants of either the Highland Rim peneplain (otherwise called the Lexington peneplain) or the nearby Cumberland Plateau (Thornbury 1965: 193). Since this area is predominantly underlain by limestone bedrock, karst features such as sinkholes and caves are numerous. The Eastern Highland Rim averages 1000 feet AMSL in elevation and is markedly delineated to the east by the massive limestone and sandstone escarpment of the Cumberland Plateau which rises abruptly 800 feet to more than 1000 feet in elevation. To the west, the resistant rocks upon which the Rim has developed form a less spectacular, more highly dissected and eroded, escarpment overlooking the Nashville Basin--an escarpment approximately 300 feet higher in elevation than the adjacent basin.

Geologically the Eastern Highland Rim is not structurally complex. It has been developed principally upon horizontally bedded limestone strata of Mississippian age which dip slightly east-southeast. Three geological formations are exposed in this area. In stratigraphic sequence these are the Fort Payne, Warsaw, and St. Louis formations. The Fort Payne formation consists of a massive deposit of calcareous and dolomitic silicastone, 100-275 feet thick, containing bedded chert, cherty limestone, and shale. The resistant chert deposits of this formation constitute the western escarpment of the Rim. Moving east, however, these deposits are progressively overlain by those of the Warsaw and St. Louis formations--to the extent that in the area of the Ducks Nest site Fort Payne deposits are only exposed in the bottoms of the more deeply incised valleys. The Warsaw formation, ranging from 100-130 feet thick, is characterized by medium to coarse-grained, cross bedded gray limestone containing some deposits of calcareous sandstone and shale. The overlying St. Louis formation ranges from 80-160 feet thick and is composed of fine-grained, brown-gray limestone which is dolomitic and cherty.

An outstanding characteristic of the geological formations described above is that all contain abundant chert. The ready access to chert, in both tabular and nodular form, provided aboriginal populations with a large supply of raw material from which to fashion stone tools. In addition, the limestone, sandstone, and shale were also used in a number of ways.

Watershed drainage within this portion of the Eastern Highland Rim is predominantly to the north. However, there are actually two patterns represented. Tributaries which have their headwaters to the east in the Cumberland Plateau flow generally north toward the Cumberland River; rivers and streams which have their headwaters in the western portion of the Eastern Highland Rim flow to the east-southeast, in accord with the slight dip of the underlying bedrock, before being diverted to the north. The Barren Fork River exemplifies this latter pattern. From its headwater tributaries in Cannon and Coffee counties, west of Warren County, the Barren Fork River flows east-southeast in a meandering course to a point in the vicinity of the Ducks Nest site. At this point the river is gradually diverted to the east-northeast. Approximately three miles northeast of McMinnville it flows into the Collins River, which in turn flows north into the Caney Fork--a major tributary of the Cumberland, joining that river just southeast of Carthage, Tennessee (Figure 2).

C. Climate

The climate of Middle Tennessee can be characterized as humid, mesothermal, subtropical, with clearly demarcated fluctuations in both temperature and precipitation (Koppen 1931). Drawing largely from climatic data gathered at the U. S. Weather Bureau Station in McMinnville (presented in Jackson et al. 1967), Warren County can be characterized as having mild winters, warm summers and abundant annual rainfall. The average annual temperature at McMinnville is 60°F, with average lowest daily temperatures ranging from near freezing in winter to the middle 60's in summer, and average highest daily temperatures ranging from the low 50's in winter to the high 80's in summer. October 28 and April 8 are the average dates of the first and last freeze, meaning that the average growing season in Warren County is 203 days long. Although Warren County has an average annual rainfall of 52 inches which is fairly evenly distributed throughout the year, precipitation is greatest in winter and early spring due to the frequent passage of low pressure systems producing general rains. In contrast, average precipitation is lightest in the fall due to the greater frequency of high pressure systems dominating the weather patterns. Thus, though periods of severe drought do occur, rainfall is generally adequate in all seasons. The prevailing wind is

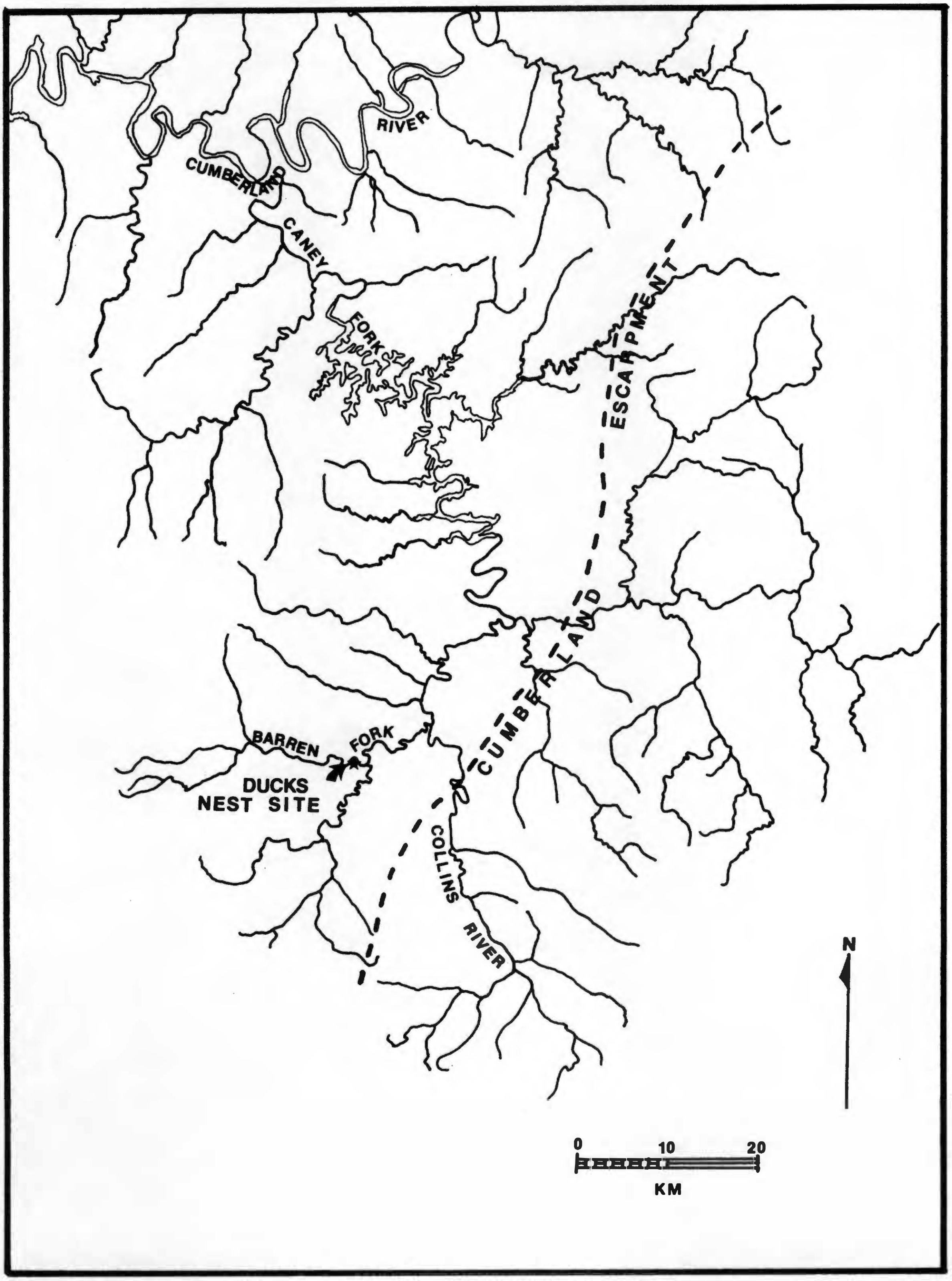

FIGURE 2. Location of the Ducks Nest site (40WR4).

from the south. During the winter, however, cold Canadian air masses frequently move across the area from the north and west.

D. Flora and Fauna

The Eastern Highland Rim is within the Carolinian biotic province (Dice 1943: 16-17). Depending upon what author is consulted, the forest community is considered to be within the Mixed Mesophytic deciduous forest region or is considered to be in a transitional zone between the Mixed Mesophytic and Western Mesophytic deciduous forest regions (Braun 1950: 152). As pointed out by Shea (1978: 601), however, little specific information is available on the floral communities in this area. In Warren County the forest community is predominantly composed of hardwood trees. Well-drained localities are characterized by communities of oak, hickory, beech, and yellow poplar, while more mesic environs contain a significant admixture of sycamore, maple, and gum. Below the canopy and understory level, the herbaceous level displays a broad spectrum of species. As emphasized by Faulkner and McCollough (1973), the flora of the Eastern Highland Rim could have provided aboriginal populations with a variety of foods and medicines, and materials for manufacturing and construction. (For a more detailed summary see Faulkner and McCollough 1973: 8-11, 28-34; and Shea 1978.)

The Carolinian biotic province is also characterized by a rich and varied fauna. For example, in the upper Duck Valley at least 13 rind species, 122 species of fish, 12 species of turtle, 213 species of birds, and 44 native mammal species are, or were at one time, present (Faulkner and McCollough 1973: 34-41; Robison 1978). Although almost all of these could have been eaten, certain species were undoubtedly more persistently exploited than others. In the Barren Fork drainage area such animals would have likely included white-tailed deer, raccoon, squirrel, rabbit, and turkey. With respect to the local molluscan fauna, recent collections from the upper Collins River indicate that only a restricted number of small, thin-shelled species is present (Arthur E. Bogan, personal communication, 1978). Although the situation may be different on the Barren Fork, there is reason to believe that even during the Mississippian occupation of the Ducks Nest site the local molluscan fauna was restricted (see Chapter VI).

E. Soils

The characteristics and formation of a soil are determined by the interaction of five factors: climate, vegetation, parent material, relief, and time. In the Eastern Highland Rim the combination of limestone parent material with deciduous forest vegetation cover and high available moisture has resulted in the formation of a series of red clayey and loamy soils which are generally acidic and low in natural fertility. Together these soils constitute the Waynesboro-Cumberland association (Jackson et al. 1967: 5). Waynesboro soils generally have a brown surface layer and a red subsoil, whereas Cumberland soils are generally characterized by a reddish-brown surface layer and a dark red subsoil. Minor soils such as Baxter, Huntington, Lindside, Sequatchie, Captina, and Whitwell comprise about 30 percent of the association.

Three principal soils are present on the ridge at the Ducks Nest site: Waynesboro loam, Cumberland silt loam, and Sequatchie loam.

The central portion of the ridge is composed of Waynesboro loam and Cumberland silt loam, while the lower terraces are Sequatchie loam. Although the Waynesboro loam is characterized as strongly acidic and low in natural fertility, the other two soils, while remaining moderately to strongly acidic, are much higher in natural fertility. Cumberland silt loam is in fact one of the most productive soils in Warren County.

In addition to the soils mentioned above, the bottomlands to the east, north, and west of the Ducks Nest site are composed of Huntington silt loam--a well-drained soil, low in acidity and high in natural fertility. Ward (1965) suggested that there was a strong correlation between the location of Mississippian sites and this soil type, arguing that it was ideally suited for primitive agriculture. As discussed in Chapter I, this has been shown to be accurate. The Ducks Nest site, however, poses an anomaly. Its location near the center and top of a ridge places it about equidistant far away from any of the parcels of Huntington silt loam present. Furthermore, the bottomlands would not have been easily accessible from this locus.

CHAPTER III

BACKGROUND OF INVESTIGATIONS

A. Initial Reconnaissance

The Ducks Nest site was initially identified and recorded in the State Division of Archaeology site survey files in 1975 by Tennessee Department of Transportation staff archaeologists. It was encountered during a reconnaissance level pedestrian survey of alternative corridor alignments for a proposed highway bypass connecting State Route 55 with U.S. 70S west of McMinnville (DuVall 1976). Because at the time the area was covered by a combination of permanent pasture vegetation and forest, surface visibility was poor--essentially restricted to a single cow path transecting the pasture through its entire north-south length of approximately 3000 feet. A total of 49 lithic artifacts, including several unifacial implements, a projectile point/knife fragment, a biface/knife, and a quantity of lithic debitage was collected from the exposed surface of the cow path. Occupation during the Middle Woodland period (ca. 100 B.C.-A.D. 700) was indicated by a greenstone (slate) celt fragment.

B. 1976 Season

On the basis of the initial survey collection and an intuitive assessment that the area had high potential for retaining undisturbed archaeological remains, the Ducks Nest site was deemed to be a potentially significant site that would be directly and adversely effected by the proposed highway construction. Consequently, in accordance with cultural resource management legislation, the Tennessee Department of Transportation contracted with the Department of Anthropology, The University of Tennessee, Knoxville, to conduct a program of phase II archaeological testing. This work was accomplished between August 23 and September 17, 1976. Drs. Charles H. Faulkner and Major C. R. McCollough served as co-principal investigators, while the author supervised the field and laboratory operations and was responsible for the final written report (Kline 1977).

The field strategy employed during the 1976 testing effort combined the manual excavation of intuitively placed two-by-two meter test units with a series of ten meter wide plowed and disced test strips, ranging from 70 to over 200 meters in length. Each test strip was intensively surface collected in 10 X 10 meter blocks. Furthermore, in areas exhibiting high artifact densities, cross trenches 1 meter wide were shovel skimmed to sterile subsoil in order to determine the presence or absence of intact subsurface remains. In sum, 17 widely dispersed two-by-two meter test units were excavated, nine test strips were plowed, disced and intensively surface collected, and 38 cross trenches were shovel skimmed.

Approximately 17,000 artifacts, predominantly chipped stone implements and the by-products of their manufacture, were recovered. The vast majority of these, however, were recovered from surface and plow zone context. On the basis of projectile point/knife typological similarities there was evidence for activity at the Ducks Nest site during each of the major periods recognized in southeastern prehistory. Taken *in toto*, however, the nature of the evidence suggested that, until the late prehistoric period, occupation there was by small groups of individuals who probably remained for only a short time. The high frequency of debitage, cores, biface/knives, and projectile points/knives indicated activities primarily associated with hunting and butchering (Kline 1977: 52).

The most significant result of the 1976 testing effort, however, was the discovery that the higher central portion of the ridge had been the locus of a small but intensive Mississippian occupation, consisting of at least one burned wall trench structure presumably with associated facilities such as storage pits, refuse pits, and hearths. Since this discrete area of habitation was encountered with only two days of field time remaining (thus adding further credence to the general law that "preliminary trenches invariably turn out to be placed so that a minimum of cultural features will be encountered" [Smith 1978: 21]), it was impossible to gather sufficient information to adequately characterize the component or assess its potential significance. The structure in fact was defined on the basis of one corner which had been exposed on the edge of a plowed test strip. Furthermore, knowledge of associated features and artifactual remains was similarily restricted. Only one feature, a shallow basin-shaped refuse pit, located 17 meters north of the structure, was encountered and excavated. Although the artifactual assemblage recovered from this feature and from the corner of the structure contained typical Mississippian elements such as small triangular projectile points and shell tempered pottery, the sample was too small for accurate characterization. For example, with regard to the ceramics, limestone tempered sherds occurred more frequently than did shell tempered ones and several sherds exhibited a mixture of shell and limestone in their temper.

Due to the above circumstances it was recommended (Kline 1977: 56) that a second season of phase II testing be conducted at the Ducks Nest site with the specific intent of gathering additional information on the Mississippian component. It was proposed that the structure previously located be excavated and an attempt be made to determine whether additional ones were present. This field work was slated to begin in the late summer of 1977. In the meantime, however, the land had been taken out of pasture and returned to cultivation. A healthy crop of three to four foot high soy beans covered the entire area. Since there was no convenient access to the structure locus, work was delayed until the crop could be harvested.

C. 1977 Season

The 1977 investigations at the Ducks Nest site were conducted between November 16 and December 18 (a period of considerably less than ideal conditions for field work) and were specifically designed to provide for the excavation of the wall trench structure that had been located during the 1976 testing effort. From a permanent primary datum situated along the fence row in the southwestern portion of the agricultural field on which the Ducks Nest site is located, an initial rectilinear grid block of 42 two-by-two meter excavation units (aligned magnetic north) was established over the structure area. The southwest corner stake of each unit was used for maintaining horizontal provenience control; the southwest corner coordinates designating each unit's distance north and west from the primary datum (e.g., 372N70W). Vertical control was also maintained within each unit. From an arbitrary 100 meter elevation datum situated north of the excavation block, relative elevations of strata, features, and postholes were recorded by means of transit and stadia rod. The elevation datum also provided a reference point from which a small scale topographic map of the structure area and adjacent terrain was prepared.

Units were excavated by shovel and trowel in accordance with three stratigraphic divisions. The uppermost stratum comprised the recent plow zone. It averaged 20cm deep and contained a moderate quantity of debitage and charcoal, and a small quantity of pottery. Underlying the plow zone was a midden accumulation which averaged 10cm thick and contained larger quantities of debitage, charcoal, daub, and pottery. Discontinuous patches of compact burnt living floor were preserved on the top surface of the midden. Underlying the midden was sterile yellow-tan subsoil clay into which aboriginal disturbances had intruded.

Features were excavated in profile prior to total excavation in order to discern any internal stratigraphy. However, no strata were observed in any of the features excavated.

Due to a multiplicity of factors, certain field methods outlined in the research proposal had to be modified during the course of the excavation. Waterscreening was to have been the principal recovery technique because of its greater efficiency and the fact that dry screening would be fruitless given the high clay content of the soil. This was not possible. Heavy rain, occasional snow, and freezing and thawing during November and December made it impossible, even with the use of a four-wheel drive vehicle and a tractor and trailer, to transport soil from the excavation area to any suitable place where waterscreening and flotation could be accomplished. Consequently, the strategy employed consisted of a combination of shovel sorting, troweling, and collecting standardized quantities of midden soil which were returned to the archaeology laboratory at the Department of Anthropology, The University of Tennessee, Knoxville, for flotation. In addition, flotation samples were collected from features and selected postholes. Although it is regrettable that no soil could be waterscreened in the field, the flotation samples yielded artifactual and ecofactual remains from a variety of archaeological contexts.

Another proposed field method which regrettably had to be sacrificed was piece plotting. It was hoped that the three dimensional plotting of all implements encountered would produce unambiguous distributional patterns interpretable in terms of localized activity areas within and around the structure. Although a small number of artifacts were piece plotted it soon became necessary to curtail this time-consuming task in order to proceed more quickly during periods of favorable weather. An additional consideration, however, was the fact that the preserved living floor was virtually devoid of artifacts--as if swept clean.

In sum, thirty-four 2 X 2 meter units were excavated to an average depth of 30cm (representing 136 square meters and 40.8 cubic meters). Within this excavation block were two superimposed wall trench structures, one oval clay-ringed fire basin, two basin-shaped refuse pits, one cylindrical storage pit, one additional pit of unknown function, and one hundred thirty-two scattered postholes not contained within the wall trenches. Also, an undisturbed sheet midden deposit was present across almost the entire excavated area. Seventeen 12.5 gallon samples of this soil (6.6 percent of the total by volume) were processed by means of water flotation, as were samples from feature and posthole context.

CHAPTER IV

CULTURAL FEATURES

A. Introduction

Before describing the cultural features excavated at the Ducks Nest site a comment regarding the 1977 excavation block is warranted. As can be seen in Figures 3 and 4, the size of the area excavated was just large enough to encompass the two structures. Ideally, the excavation block would have been expanded in order to ensure that outside activity loci and associated features were also incorporated. Unfortunately, field conditions were not ideal and it was impossible to adequately expand into the surrounding area. Since outside activity loci and associated features have been frequently encountered at other Mississippian sites this situation must be mentioned as a recognized shortcoming in the present data. However, it should also be noted that the circumstances surrounding the initial discovery of the structures have a bearing on this problem. The habitation area was encountered on the eastern edge of a 10 meter wide plowed test strip that was aligned N 23° W. Furthermore, it was located at approximately the mid-point of that strip, meaning that for 85 meters to the north-northwest and 100 meters to the south a strip of land 10 meters wide had been previously examined. Although this entire strip was intensively surface collected and selected portions of it were shovel skimmed in an effort to locate intact subsurface remains, only one feature (Feature 76-3) was

FIGURE 3. 1977 excavation area.

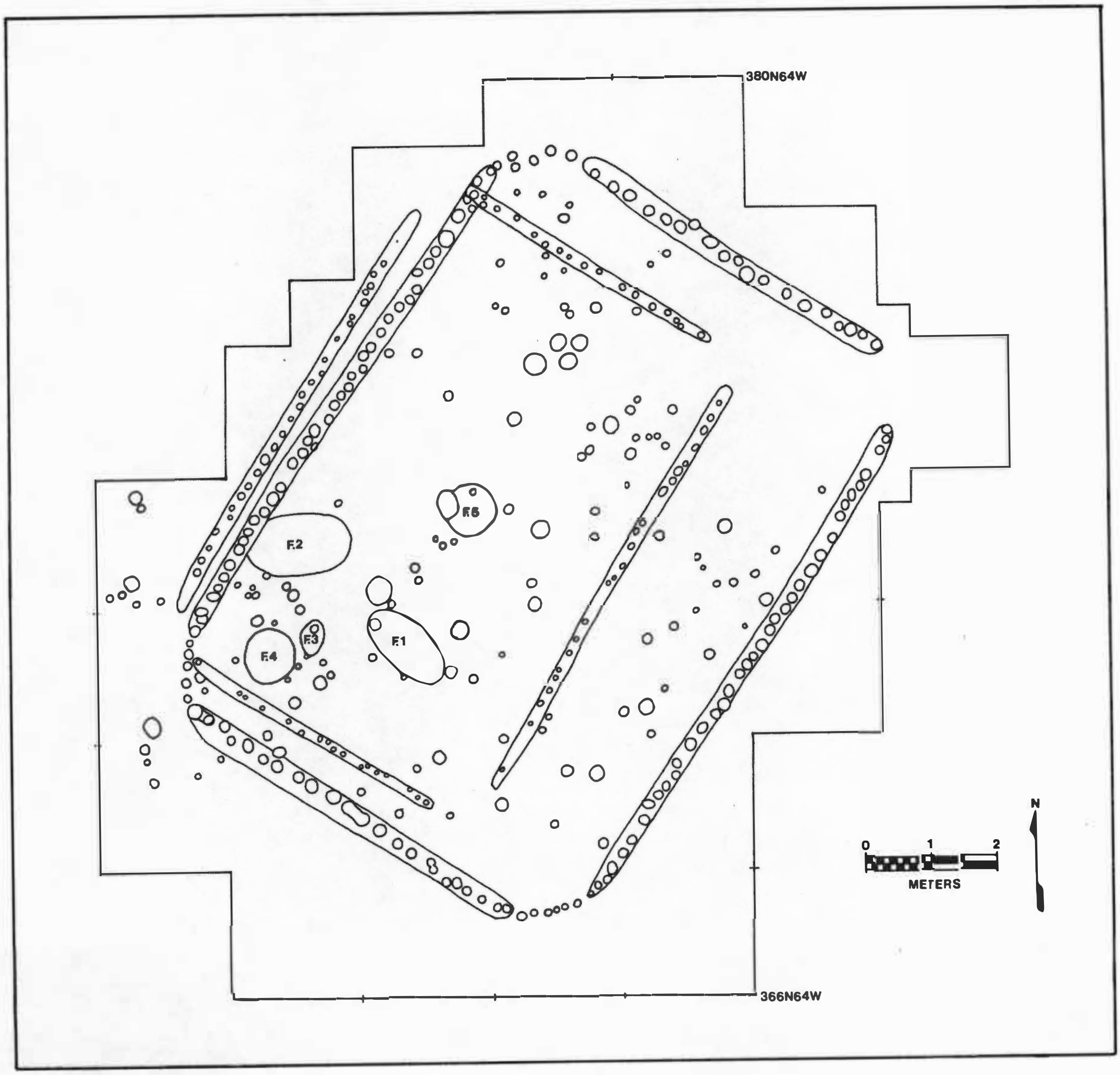

FIGURE 4. Plan of 1977 excavation area.

encountered (Kline 1977: 46-49). In addition, at approximately 30 and 50 meters west of the habitation area two parallel test strips were plowed. No cultural features were encountered in either one. The evidence, therefore, suggests that if additional facilities/installations are present they must be located in the unexcavated areas to the north and east of the structure locus.

With this in mind, the author returned to the site after it had been plowed in the spring in order to check for surface indications of additional features. None were found. It was evident, however, that the density of surface material decreased substantially at approximately 8-10 meters in all directions away from the structure locus. As a final note, the ground within a radius of 200 meters of the 1977 excavations was intensively examined for evidence--in the form of surface concentrations of charcoal, daub, pottery, or chipping debris--that additional structures may have been present. Again, none was found.

Early in the 1977 field effort it became apparent that the habitation area identified during the previous field season contained two superimposed wall trench structures. In association with these were five features of various forms. Adding to this total the feature that was excavated during the 1976 investigations (Feature 76-3), the Mississippian component at the Ducks Nest site is represented by two wall trench structures, six features, and the artifactual and ecofactual remains recovered in association with them.

B. Structures

Although both of the structures excavated were of wall trench type construction and had identical long-axis orientations, they differ considerably in size and in certain architectural details. Portions of the wall trenches forming the western corner of the larger structure had been defined at the end of the 1976 testing effort, but the presence of the smaller structure was not suspected at that time. Consequently, the larger structure was excavated first and designated Structure 1, while the smaller one was excavated last and designated Structure 2. By coincidence these designations represent the sequence in which the structures were built.

Structure 1--temporally the older of the two, was a large rectangular dwelling with a long axis orientation of N 48° E (Figure 5). Its interior measured 10 X 7.2 meters, encompassing a living area of 72 square meters. As indicated by the absence of intervening postholes, entry was obtained through the eastern corner. This entryway was 1.1 meters wide. The remaining three corners were closed by rows of posts connecting the ends of the wall trenches. Six posts each were incorporated into the northern and southern corner closures, while the western corner was formed by seven posts--the southernmost two being paired. The wall trenches of Structure 1 were remarkably straight, tapered to rounded-pointed at the ends, and were unusually massive, ranging from 28-32cm wide and from 55-65cm deep below plow zone. Progressing clockwise from the southeast, the individual wall trenches measured 8.5, 5.8, 8.5, and 5.3 meters in length, respectively. The relative shortness of the northeastern trench, however, was not an

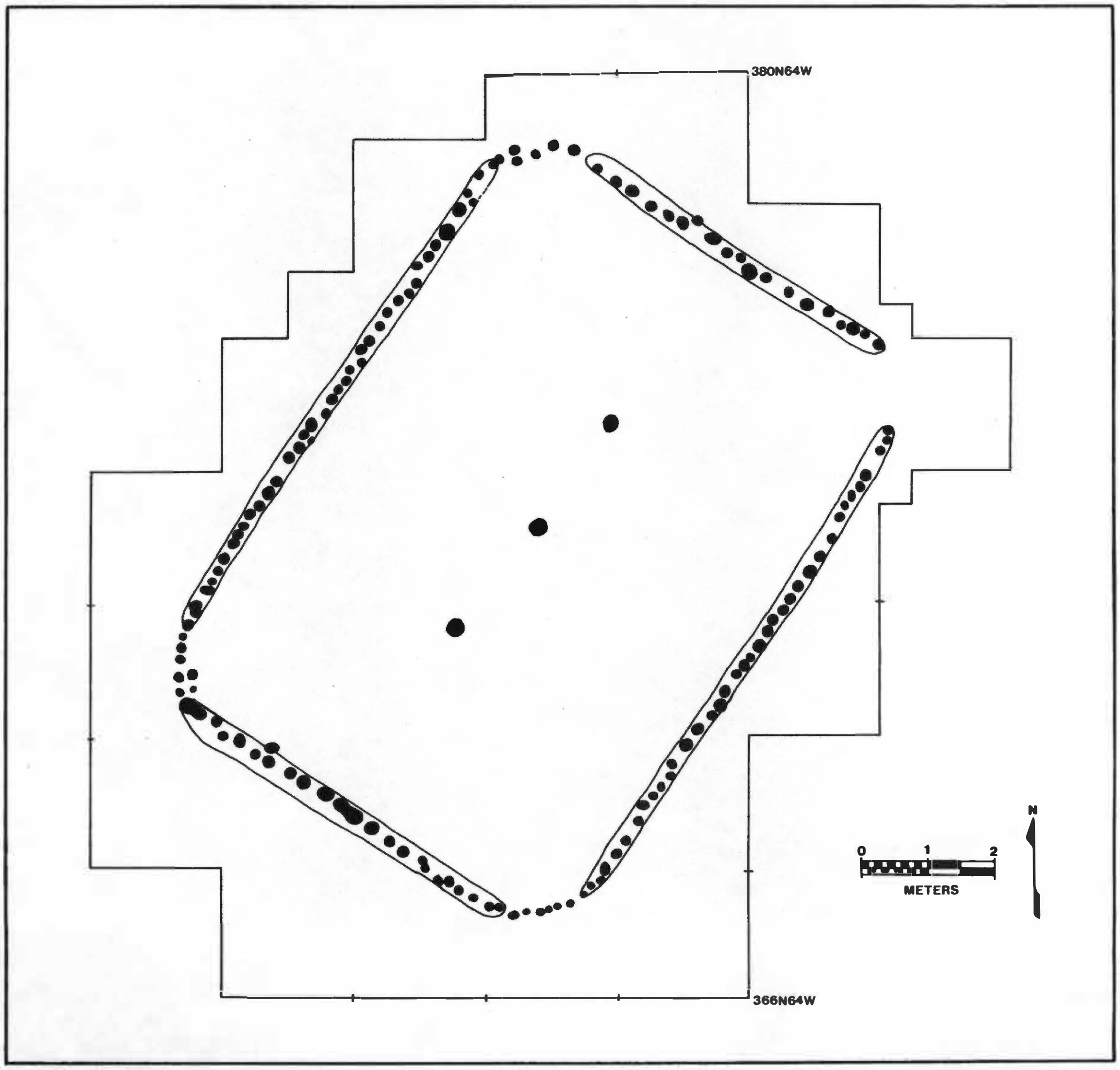

FIGURE 5. Plan of Structure 1.

accommodation to make the eastern corner entryway larger. Instead, this trench was shortened somewhat toward the northern corner.

Individual wall posts within the Structure 1 trenches were closely spaced, relatively large, averaging 16.4cm in diameter, and deep set into the ground 5-10cm below the bottoms of the trenches. Comparatively, the posts forming the corners were considerably smaller and less deeply set into the ground, averaging 12cm in diameter and 26.4cm in depth below plow zone. A single row of three large posts equidistantly spaced on the central long axis of the structure provided interior roof support. These posts averaged 26cm in diameter and 35cm deep, and were positioned such that a gap of 2 meters separated the center post from each end post; and each end post was placed 3 meters away from the end walls of the structure. The southernmost support post had a ramp extending into it from the northwest--apparently to aid in positioning that structural member upright.

In summary, Structure 1 would have required a considerable amount of effort to build. Not only was it large, but the massiveness of its wall trenches is unusual. In fact, these were essentially dug to the level of the underlying limestone saprolite. Additionally, there were a minimum of 145 posts incorporated into Structure 1. Although an attempt was made to define interior facilities such as benches or partitions, there was no discernible patterning in the distribution of interior posts. Since Structure 1 had burned, most of the associated postholes contained abundant charcoal. The fill from approximately one-third of these was retained for flotation. Unfortunately, disturbance during the later occupation and from recent cultivation had destroyed any remains of the superstructure. It can only be guessed, therefore, from the row of support posts down the middle of the structure and from the size of the wall posts, which would seem to preclude a tensioned-pole pattern, that some form of gable construction was employed. In addition, there was a general lack of daub associated with Structure 1, indicating that its walls and roof were probably made of overlain twigs, branches, or perhaps cane matting.

Structure 2 (Figure 6)--because Structure 2 was almost wholly contained within Structure 1, the relatively more recent age of it was difficult to determine in the field. Only the minimal amount of superposition present in the northern corner provided observations to establish the sequence of construction. The field evidence, however, was not clear. The fill in the wall trenches of both structures was very similar, and the end of the Structure 2 wall trench terminated within the wall trench of Structure 1. Consequently, it was difficult to determine which one had intruded the other. It was observed, however, that the fill of Structure 2 trench had a slight red tinge, and that this could be faintly discerned across the Structure 1 trench. Fortunately this observation is now supported by a series of comparative radiocarbon dates (see Chapter VIII).

Although Structures 1 and 2 share certain features such as rectangular plan, wall trench construction, and long axes oriented northeast-southwest, Structure 2 is different from Structure 1 in several details. Structure 2 was smaller, measuring 8.1 X 5.3 meters and thus encompassed a living area of 42.9 square meters. The wall trenches were markedly narrower and shallower, ranging from 18-24cm wide and from

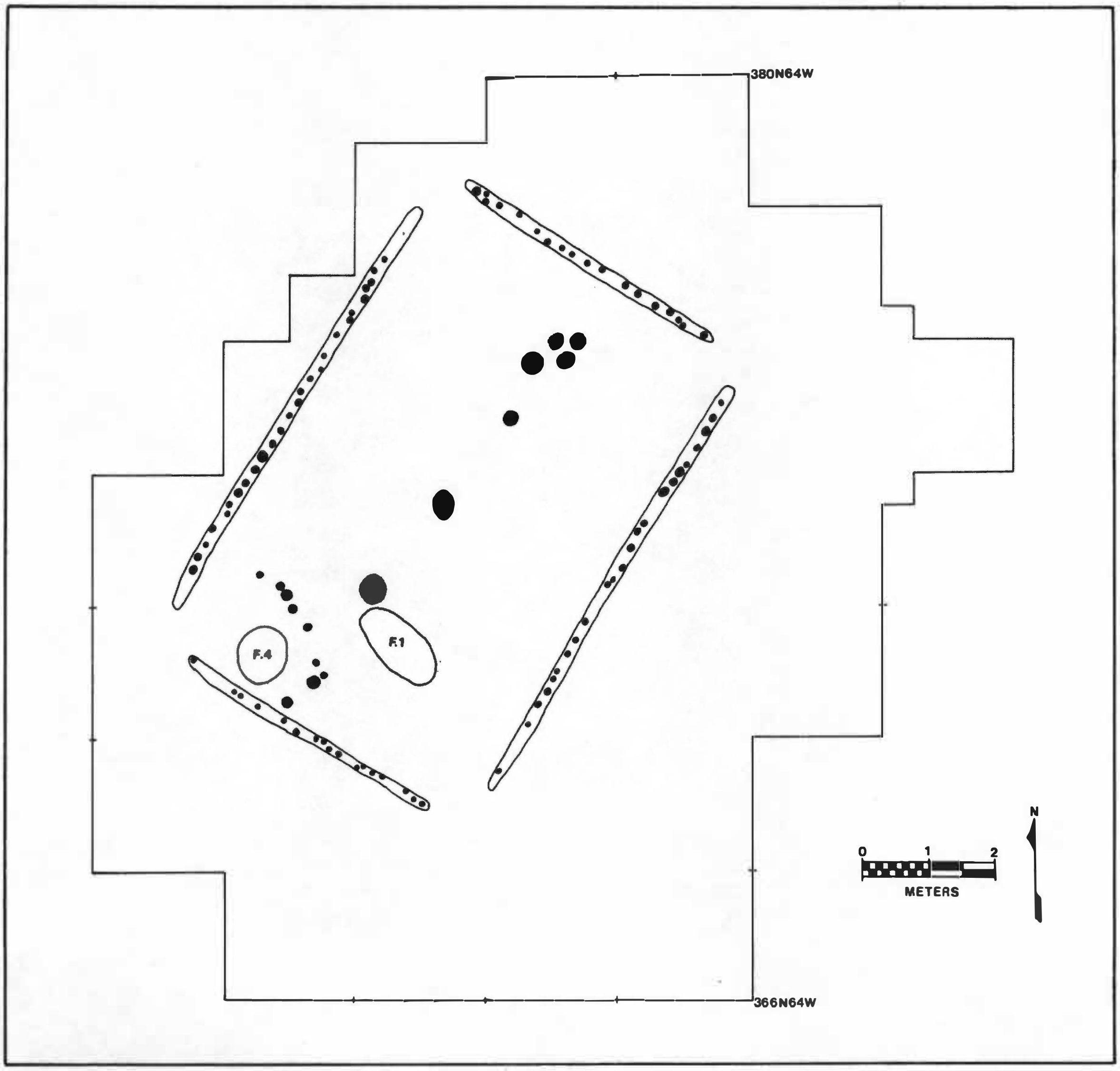

FIGURE 6. Plan of Structure 2.

16-20cm deep below plow zone. End trenches and side trenches were, respectively, 4.3 and 7.1 meters long. Possibly due to their small size, individual posts within the wall trenches could not be discerned until the fill of the trenches had been removed. Since the posts were tapered and were shallowly set into the bottoms of the trenches, only the tips of them were detected. Consequently, the diameter measurements obtained on the 83 posts plotted are not reflective of the actual size of the posts. These conditions probably also explain the gaps in what is otherwise a pattern of regularly spaced posts.

In contrast to Structure 1, none of the corners of Structure 2 were closed by rows of posts connecting the ends of the trenches. Although the southern corner exhibits the largest gap, measuring 90cm (in comparison to 70cm for the other three corners), there is reason to believe that neither this corner nor the western one functioned as an entryway. In the southern one-third of Structure 2 was a large clay-ringed hearth (Feature 1) which would have been continually exposed to wind had the adjacent corner served as an entryway. A large cylindrical storage pit (Feature 4) in the western corner, apparently isolated by a partition, would effectively preclude that corner's use as an entryway. Consequently, it is argued that entry into Structure 2 was obtained through the eastern and/or northern corner. More specifically, it is thought that the eastern corner, as with Structure 1, was the permanent entrance since the living floor adjacent to it was compacted--indicative of a high traffic area.

The superstructure of Structure 2 was supported by a single row of three large posts positioned along the central axis in a pattern virtually identical to that of Structure 1. These posts, however, were not positioned with the same regularity. Although the middle post was placed at the exact center point of the structure, the outer posts were not equidistantly spaced along the centerline from this point. The southern support post was installed 1.7 meters away from the middle post, placing it 2.35 meters away from the end wall of the structure, while the northern support post was installed 2.5 meters away from the middle post, placing it 1.55 meters away from the end wall of the structure. Despite the smaller size of Structure 2, these three posts were actually larger and more deeply set into the ground than those of Structure 1, averaging 34cm in diameter and 40.3cm in depth below the plow zone. A probable explanation for this is derived from the distribution of daub on the floor of Structure 2. Daub was concentrated in the area between and around the middle and northern support post. It has been suggested (Major C. R. McCollough, personal communication, 1977) that this pattern indicates the presence of a heavily daubed roof smoke hole which collapsed onto the floor when the structure burned. Two additional observations strengthen this interpretation. First, underneath the daub concentration were several discontinuous patches of highly compact burnt floor. These probably represent surface hearths. Second, a cluster of three relatively large posts was present immediately adjacent to the northern support post and an additional post was installed on the central axis of the structure, approximately 90cm away (south) from the northern support post. The weight of a heavily daubed smoke hole may have necessitated the installation of these posts in order to provide adequate support.

Although the remainder of the postholes recorded inside and outside of Structure 2 were examined for patterns indicative of associated facilities, none were definable. Structure 2, however, was destroyed by fire leaving behind a number of fragmentary carbonized structural elements. Unfortunately, these were not preserved in sufficient detail to allow an accurate reconstruction of the superstructure of this dwelling. It can only be surmized that the pattern was similar to that of Structure 1. Radiocarbon/wood identification samples were collected, however, and it is therefore possible to compare Structures 1 and 2 in terms of constituent wood types used in construction and radiometric dates.

In summary, although Structure 2 is different from Structure 1 in several details, the overall pattern reflects a difference in degree rather than kind. The principal distinguishing characteristics of Structure 2 were its smaller size, less massive wall trenches, and lack of enclosed corners. Otherwise the mode of construction was the same--a rectangular living area encompassed by four walls, the posts to which had been set in trenches dug into the ground, and a system of three interior roof supports positioned on the central long axis of the structure. Less effort would have been required to build Structure 2, but it was nonetheless a substantial dwelling.

Unfortunately, the exact length of time that each structure was occupied will never be known. It can only be suggested that if the same range of activities was undertaken by the inhabitants, then a minimum of two years or periods of occupation is represented. In all probability this is ultra-conservative. However, the small quantity of artifactual remains recovered indicates that neither occupation was of long duration. In addition, the manner in which the two structures were superimposed suggests that no long period of time intervened between the destruction of Structure 1 and the building of Structure 2. It is considered possible that the same group of individuals may have built both structures. If so, this might explain the common orientation, since Structure 2 could in fact have been placed at virtually any angle and still have been almost entirely encompassed within Structure 1.

C. Features

The six features excavated at the Ducks Nest site will be discussed below by consecutive number, since the utility of describing them under morphologically and/or functionally defined classes is dubious given the size of the sample. Each will be discussed in terms of its morphological attributes, associated artifacts, ecofactual remains, probable use/function, and relationships to other features. The artifacts and definition of the terms employed are discussed elsewhere.

Feature 1 was in unit 370N70W, placing it in the southern one-half of Structure 2 but to the southeast of that structure's centerline (Figure 4, page 32). It was a shallow oval basin measuring .73 meters wide, 1.42 meters long, and 12cm deep, with the long axis oriented perpendicular to the long axis of Structure 2 (Figure 7). Around the periphery was an apron of compact yellow clay, 6-9cm thick and 20-25cm wide. Evidence of burning on the floor and on the inner edge of the surrounding clay apron indicates that it served as a fire basin/hearth. The fill from this feature was processed by flotation. It contained a

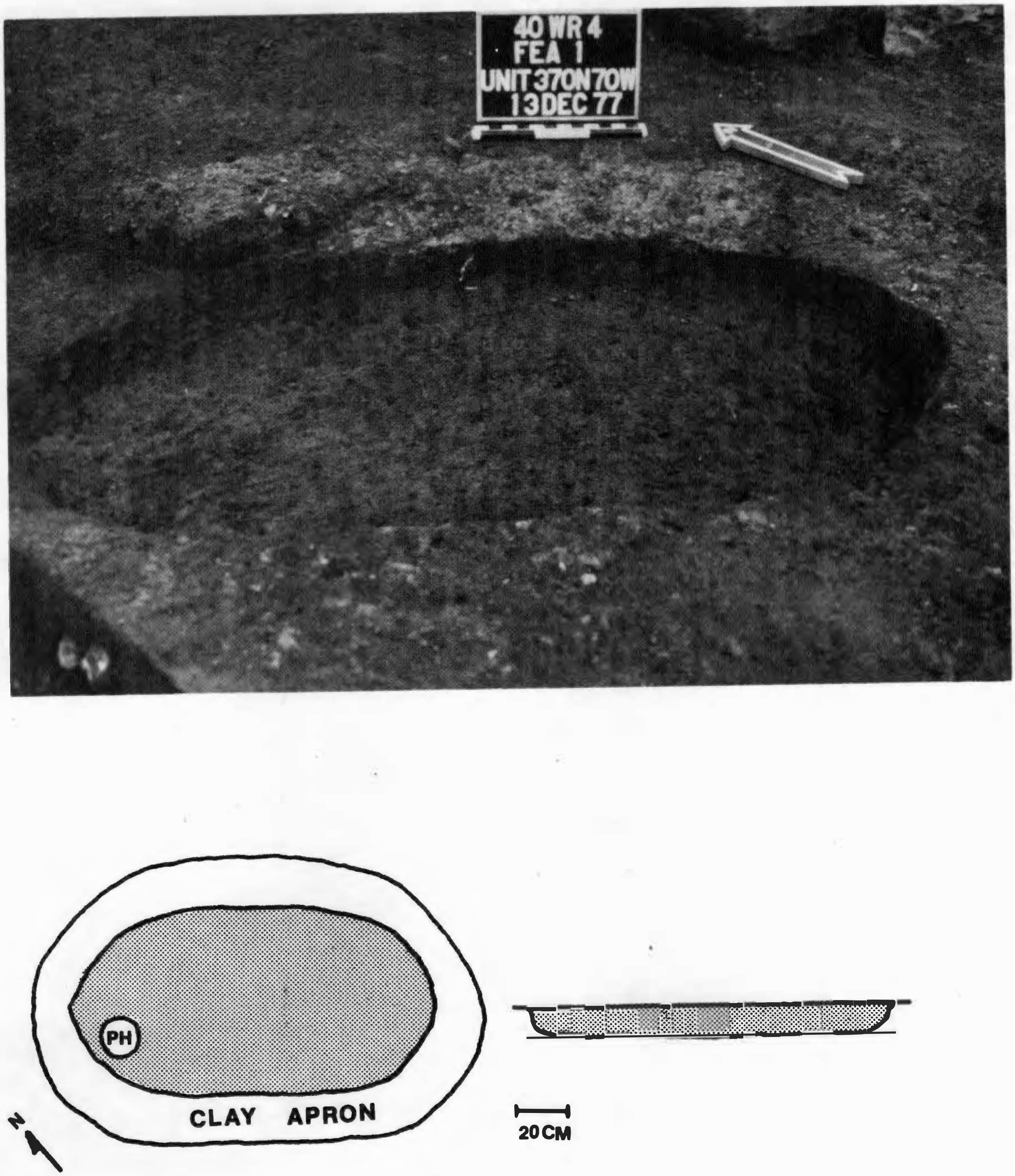

FIGURE 7. Feature 1--fire basin/hearth in Unit 370N70W.

large quantity of debitage, particularly bifacial thinning flakes, a large number of projectile points/knives, utilized flakes, a small quantity of pottery, 6.98 Kg of rough rock, and a small quantity of carbonized botanical and calcined faunal remains. Since the southernmost interior support post of Structure 1 was encountered beneath a portion of the surrounding clay apron, Feature 1 can be confidently associated with the occupation of Structure 2. Furthermore, Feature 1 and Feature 4, a storage facility 1.2 meters to the west-southwest, may be functionally associated, indicating that the southern third of Structure 2 was principally a food storage and processing area.

Feature 2 was a shallow oval basin excavated in unit 372N72W (Figure 4, page 32). It measured 20cm deep, 94cm wide, and 149cm long, with the long axis oriented east-west (Figure 8). When the Structure 1 wall trench was installed this feature was truncated diagonally across its western edge. Consequently, Feature 2 predates the occupations of both structures. Nonetheless, the ceramics it contained associate it with a Mississippian occupation. Since initial profiling revealed no stratigraphy and only a small number of artifacts and ecofacts were recovered, a five bucket sample was retained for flotation and the remainder of the fill was trowel sorted. Whatever its original function, Feature 2 ultimately served as a receptacle for refuse. It contained a small quantity of debitage, several utilized flakes, five complete and fragmentary projectile points/knives, 2.17 Kg of rough rock, eleven sherds, and a small quantity of ecofactual remains.

Feature 3 was a small shallow basin excavated in the northeastern quadrant of unit 370N72W (Figure 4, page 32). It was irregularly oval

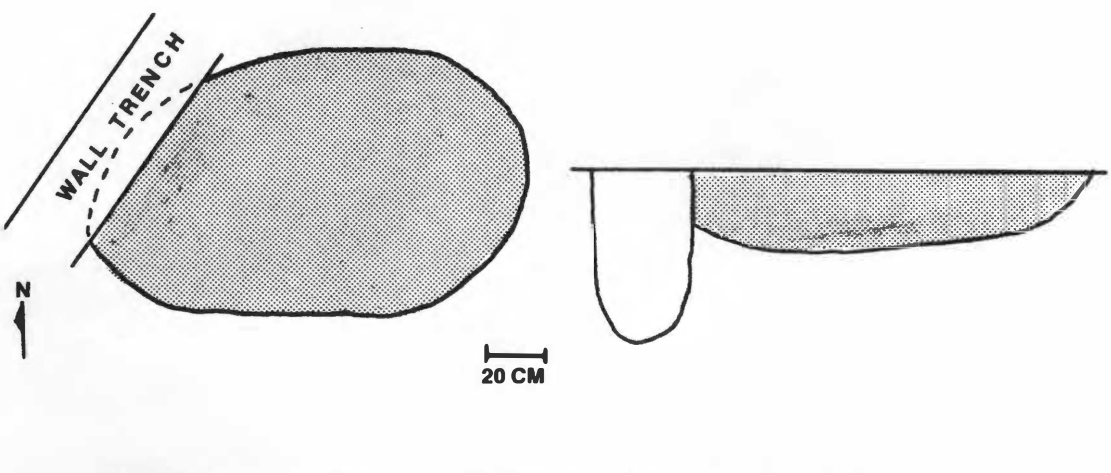

FIGURE 8. Feature 2--refuse pit in Unit 372N72W.

in outline, measuring 35cm wide, 52cm long, and 15cm deep with the long axis oriented slightly northeast-southwest (Figure 9). The function/use of this feature is unknown. It contained only a small quantity of rough rock and 13 chert tempered sherds. None of the fill was floated. It was initially thought that Features 3 and 4 were functionally related; however, if the pattern of posts around Feature 4 represents a screen or partition then the presence of one of those posts in the bottom of Feature 3 would eliminate that possibility. Based upon the associated ceramics, Feature 3 may in fact be a Late Woodland facility.

Feature 4, excavated in unit 370N72W (Figure 4, page 32), was a deep cylindrical pit measuring 77cm wide, 82cm long, and 62cm deep (Figure 10). Unlike the other features excavated, the floor and a portion of the northern section of wall were lined with large limestone slabs--one piece of which was actually a large digging implement made of coarse-grained fossiliferous limestone that had been broken across the bit. The rock lining indicates that Feature 4 probably served as a storage facility, before being filled with refuse. The fill (.30m^3) was processed by flotation and a diverse array of artifactual and ecofactual remains was recovered. It contained a moderate quantity of debitage, two projectile points/knives, several utilized flakes, 9.32 Kg of rough rock (excluding the 42.39 Kg of rock incorporated into the floor lining), 31 sherds, a small quantity of calcined bone, and carbonized botanical remains including a variety of wild and domesticated plant foods. Feature 4 was probably functionally associated with Feature 1--together forming a food storage and processing complex associated with the occupation of Structure 2.

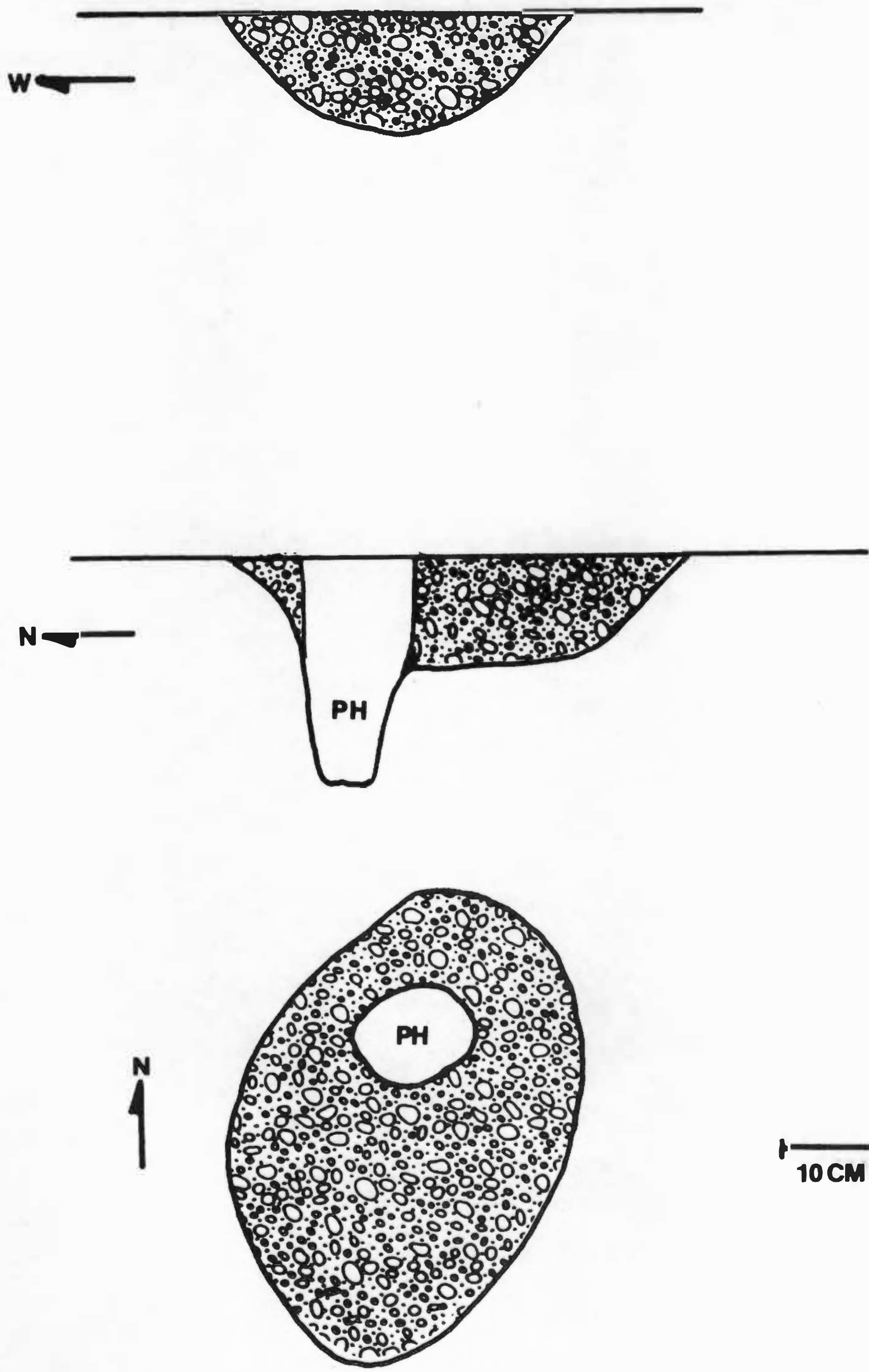

FIGURE 9. Feature 3--small shallow basin in Unit 370N72W.

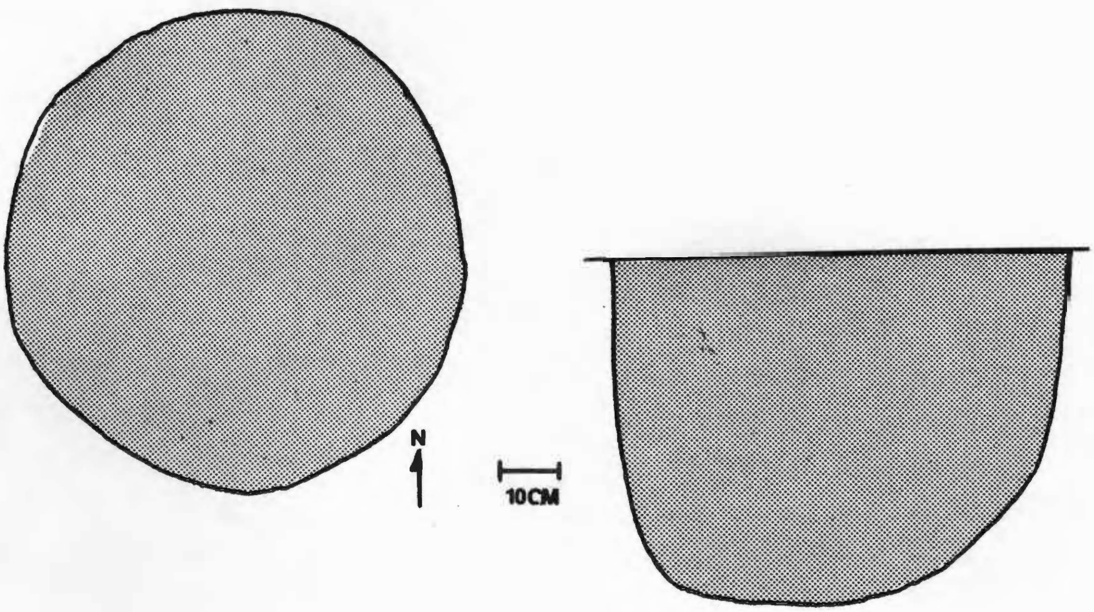

FIGURE 10. Feature 4--storage pit in Unit 370N72W.

Feature 5 was a roughly circular basin excavated in the northeast quadrant of unit 372N70W (Figure 4, page 32). In length, width and depth it measured 82cm, 80cm, and 40cm, respectively (Figure 11). A concentration of pottery was encountered in the center of the feature at a depth of 15cm and from the sample of fill ($0.05m^3$) processed by flotation additional pottery, debitage, charcoal, and rough rock was recovered, indicating that Feature 5 served as a refuse receptacle. On its western edge Feature 5 was intruded by the central interior support post of Structure 2. Consequently, the feature must have been installed prior to that occupation. The ceramics are consistent with the remainder of the Ducks Nest sub-assemblage and, therefore, Feature 5 is probably associated with Structure 1. However, the possibility remains that it, like Feature 2, may even predate that occupation.

Feature 76-3, a shallow circular basin, was excavated 17 meters N 23° W of the western corners of Structures 1 and 2. In length, width, and depth it measured 93cm, 87cm, and 19cm, respectively (Figure 12). It served as a refuse receptacle. In the fill, all of which was processed by flotation, were 80 lithic artifacts, 53 sherds, 6 clay beads, a "pinch pot" fragment, a small quantity of badly fragmented calcined bone, and a similar small quantity of carbonized botanical remains. This assemblage compares quite favorably with that recovered from the adjacent habitation area.

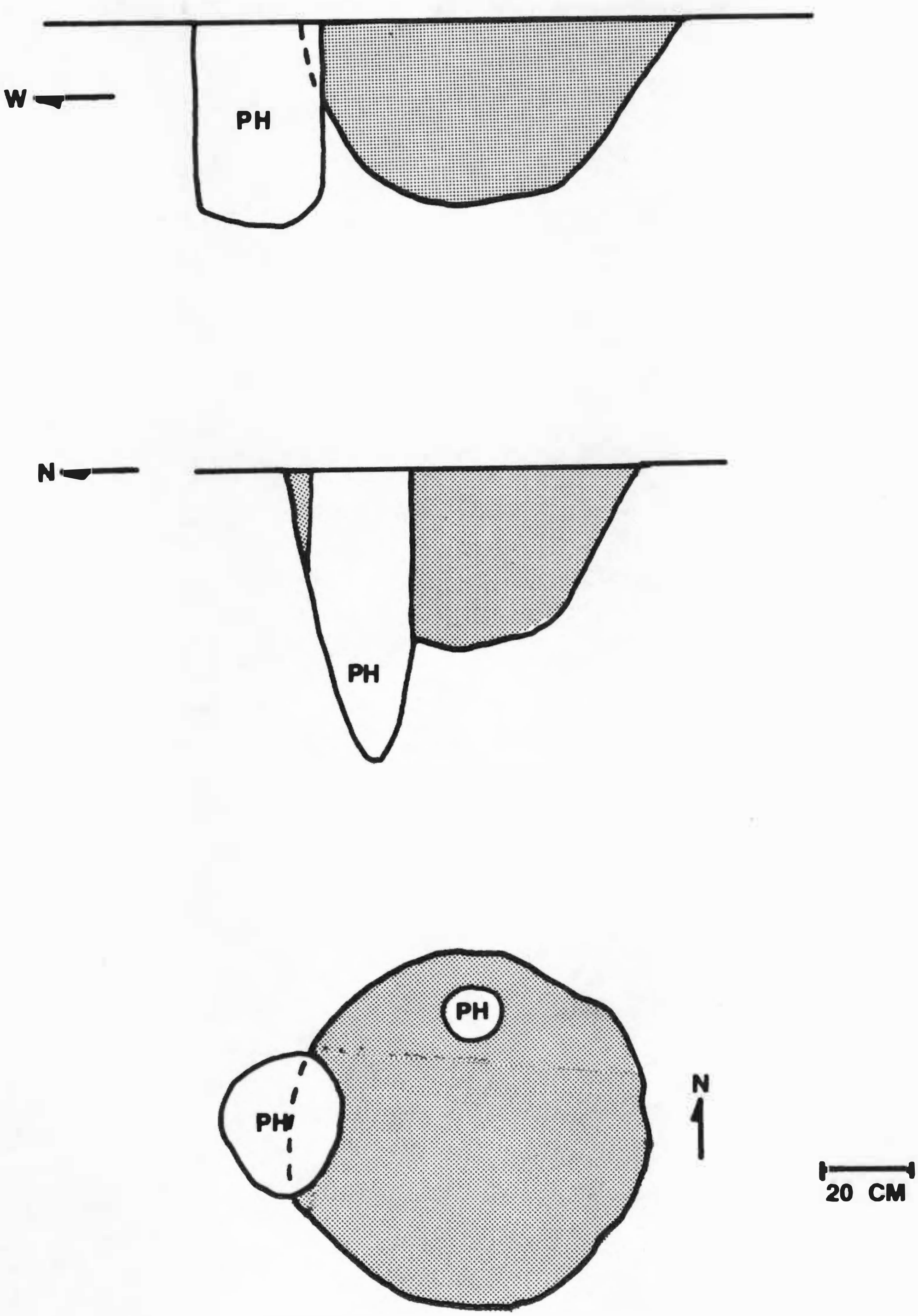

FIGURE 11. Feature 5--refuse pit in Unit 372N70W.

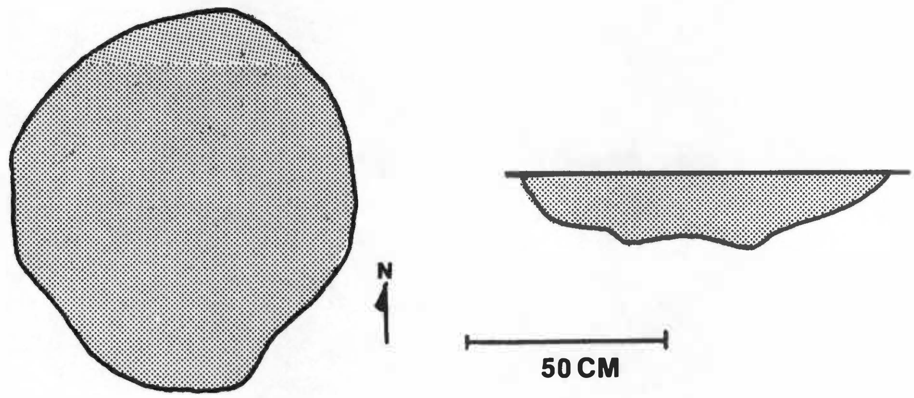

FIGURE 12. Feature 76-3--refuse pit excavated during 1976 field season.

D. Postholes

In addition to the 231 postholes contained within the patterns of Structures 1 and 2, there were 132 postholes distributed among the 34 excavated units. Although it was impossible to excavate all of these, their locations, diameters, depths, and fill characteristics (i.e., whether they contained rock, charcoal, or daub) were recorded. The latter two of these observations were determined by probing.

With the exception of a series of postholes isolating Feature 4, there was no discernible patterning in the distribution of postholes within either structure. The number of postholes suggests interior facilities such as benches, seats, racks, and partitions. The nature of these, however, is unclear. It is probable that they were movable, or only minimally secured, and consequently are not definable strictly on the basis of posthole patterns.

E. Midden Deposit

Underlying the plow zone was an undisturbed midden averaging 10cm thick. It appeared as a homogeneous layer of dark brown soil clearly discernible from the plow zone above and the sterile subsoil clay below (Figure 13). Although this deposit undoubtedly accumulated during the occupations of both structures, it was not stratified--indicating that only a short period of time had probably elapsed between the burning of Structure 1 and the building of Structure 2. Merely from the horizontal distribution, it was impossible to determine whether specific areas were associated with one or the other of the two structures. Only in the extreme eastern and western columns of excavation units did the

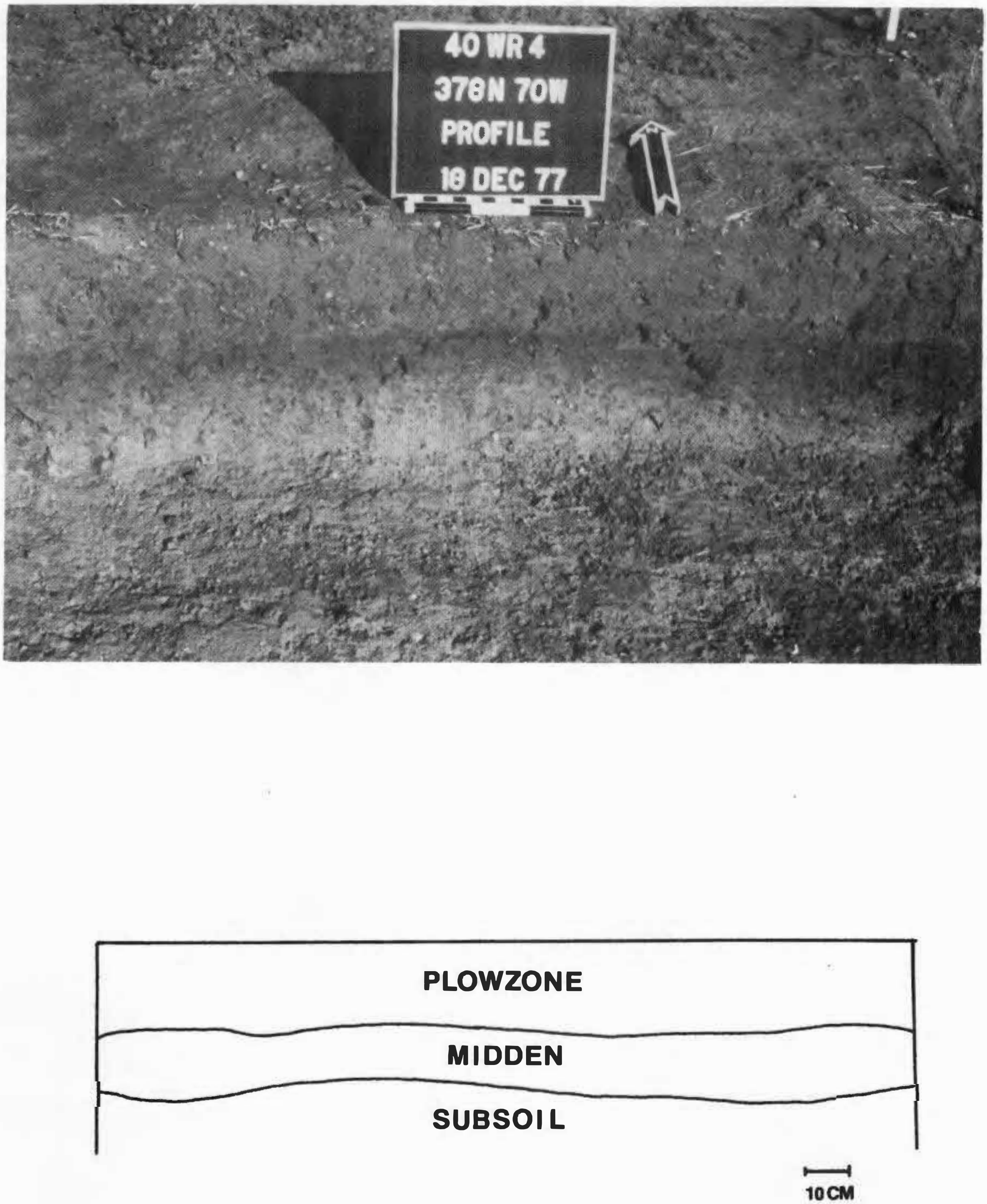

FIGURE 13. Representative stratigraphic profile.

midden deposit diminish. To the north-northeast and south-southeast it was continuous, extending outward from the excavation block for an undetermined distance.

Seventeen 0.05 cubic meter samples of midden soil were taken for water flotation. These were distributed among 11 units and were selected to increase the archaeobotanical and ceramic samples.

CHAPTER V

LITHICS

A. Introduction

Lithics comprise the largest single class of artifacts recovered at the Ducks Nest site. These were analyzed along two major dimensions. First, although no lithic resource surveys have been conducted in the Barren Fork drainage area, it was deemed desirable to establish a preliminary raw material typology in order to continue this aspect of analysis that was initiated in Middle Tennessee during the Normandy Reservoir Archaeological Salvage Project (Faulkner and McCollough 1973; Penny and McCollough 1976). On the basis of macroscopically observable characteristics, 19 types of chipped stone and 3 types of ground stone raw material were recognized (Table 1). Second, an artifact typology based upon consistently recurring morphological attributes was established.

B. Lithic Raw Materials

Since the Eastern Highland Rim is composed of lithological units which contain an abundance of chert and since little is presently known about the range of variation in color, texture, and distinctive inclusions in these, especially in the vicinity of the Ducks Nest site, the approach taken has been to emphasize the <u>differences</u> exhibited in

TABLE 1. Lithic Raw Material Types.

Type	Description
A	Vein Quartz/Chalcedony
B	Agate
C	Blue-Gray and Tan: Tan Variety
D	Blue-Gray and Tan: Blue-Gray Variety
E	Brown and Tan
F	Dark Gray-Blue
G	Mottled Blue-Gray Fossiliferous
H	Dark Gray Fossiliferous
I	White Fossiliferous
J	Light Tan Tabular
K	Coarse-Grained Multicolored
L	Blue-Gray Nodular
M	Gray Nodular
N	Blue-Green Nodular
O	Dark Gray Vitreous
P	Mat Gray Nodular
Q	Gray-Blue Speckled
R	Mottled Medium-Dark Gray
S	Tan and White Mottled
T	Other Cryptocrystaline Quartz (Specify)
U	Sandstone
V	Soapstone
W	Igneous

macroscopically observable characteristics. The result has been to establish a rather large number of raw material types. When additional information about lithic raw material sources in this area becomes available, however, it is hoped that this approach will facilitate the proper assignment of sources to these raw material types and eliminate the necessity for reanalysis. Although little can be said concerning specific source localities of the lithics recovered at the Ducks Nest site, several of the types isolated are identical to types described by Faulkner and McCollough (1973) and Penny and McCollough (1976) in their study of lithic materials utilized by aboriginal populations inhabiting the Normandy Reservoir precinct of the upper Duck River Valley. This information provides valuable clues concerning the geological derivation of lithic raw materials recovered at the Ducks Nest site. In the descriptions below each material type is characterized, the probable geological derivation is identified, and the frequency of occurrence within the Ducks Nest assemblage is noted (Tables 1 and 2).

A. Vein Quartz/Chalcedony

This is a dense opaque white to blue tinted quartz that typically occurs in water worn rounded cobbles 4 to 6 inches in diameter. Large quantities of this material are reported from the Hillsboro locality approximately 20 miles south of the Ducks Nest site (Penny and McCollough 1976: 181-183). Although the specific geologic context is unknown it is thought to be derived from Pennsylvanian deposits in the Cumberland Plateau escarpment. It is probable that deposits bearing this material occur in coves that abutt the Cumberland Plateau escarpment

TABLE 2. Relative Frequencies of Chipped Stone Raw Material Types.

	RAW MATERIAL																			
Provenience	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
Features	*		19	6	15	1	20	2	4		1	2	9	16		2			3	*
Postholes	1	*	23	3	16	4	12	6	6	1	*	1	14	9		1	1		2	*
Unit Levels	1	*	28	9	9	1	8	3	11	*	*	2	9	12	*	1	*	*	2	*
Cumulative Frequency	1	*	25	7	11	1	12	3	8	*	*	2	9	13	*	1	*	*	2	*

*Present, less than 1 percent.

in the immediate vicinity of the Ducks Nest site. One percent of the Ducks Nest chipped stone sub-assemblage is accounted for by this material.

B. Agate

This is a semi-translucent variegated form of quartz belonging to the variety chalcedony (Fenton and Fenton 1940: 25). It occurs in small nodules and fragmented blocks which vary from white to red to amber to black, and includes specimens exhibiting combinations of these colors. Geologically this material is derived from Middle Ordovician deposits in the Wartrace Locality, but is also known from other geological contexts in the Eastern Highland Rim (Penny and McCollough 1976: 185-189). Numerically it is insignificant at the Ducks Nest site, accounting for less than 1 percent of the total chipped stone raw material. All of the specimens recovered, however, are red and amber varieties. Since Penny and McCollough (1976: 188) note a conspicuous absence of red-amber agate from the Hillsboro Locality, it is suggested that the source of the Ducks Nest specimens was probably in the Wartrace Locality approximately 30 miles to the west-southwest.

C. Blue-Gray and Tan Chert: Tan Variety

This material corresponds to one of two varieties of lower Mississippian Fort Payne Formation chert described by Faulkner and McCollough (1973: 53) and further discussed by Penny and McCollough (1976: 151-158). It is a medium to coarse textured opaque chert that occurs in massive tabular deposits and is distinguishable on the basis of mottled and intermingled blue-gray and tan constituents. There is a wide range of variation, but it has been observed that beds of predominantly tan chert overlie beds that are predominantly blue-gray. This is the basis for separating these two varieties in the present analysis. At the Ducks Nest site the tan variety is the most frequent type, comprising 25 percent of the total.

D. Blue-Gray and Tan Chert: Blue-Gray Variety

This variety of lower Mississippian Fort Payne formation chert is similar in all characteristics to the tan variety, except predominant color. However, it accounts for only 7 percent of the chipped stone raw material. The frequency of this variety relative to the tan variety may reflect the general stratigraphic relationship between the two. In the area of the Ducks Nest site Fort Payne deposits are exposed only in the bottoms of the more deeply encised valleys. It is possible that the underlying blue-gray deposits simply have not been as extensively exposed as the overlying tan deposits.

E. Brown and Tan Chert

This is a medium-grained heterogenous chert which is predominantly brown but which is mottled with more coarsely-grained tan inclusions, small blue agatized inclusions, and numerous very small fossil fragments. It is a tabular chert which resembles the Fort Payne formation cherts described above. At 11 percent it is the fourth most abundant chipped stone raw material utilized at the Ducks Nest site.

F. Dark Gray-Blue Chert

This chert is uniformly fine-grained and homogeneous in both color and texture. It is nodular and has a thick tan calcareous cortex with a thin reddish-brown subcortex 1-2mm thick. Although the geologic context from which it derives is unknown, the cortex, subcortex, color, and homogeneous fine-grained texture suggest that it is derived from the upper Mississippian St. Louis formation. This type constitutes 1 percent of the total chipped stone raw material at the Ducks Nest site.

G. Mottled Blue-Gray Fossiliferous Chert

This is a medium to light blue-gray chert which contains a small number of highly fragmented fossils, primarily crinoid stems. It is medium texture, tabular, and many pieces exhibit a dense siliceous reddish-brown weathered rind. Although the geologic origin of this chert is not firmly established, comparable samples to those recovered at the Ducks Nest site have been collected from Mississippian Warsaw deposits near Tullahoma, Tennessee (Penny and McCollough 1976: 176-178). The fact that this material is the third most abundant type at the Ducks Nest site (12 percent) indicates that it was available locally. This is consistent with the abundance of Warsaw Formation exposures in the area.

H. Dark Gray Fossiliferous Chert

This material is probably a variety of the type described immediately above. It is a tabular dark gray medium to fine-grained chert which has a speckled appearance because of small angular fossil inclusions that are agatized and light blue. The cortex is siliceous, not calcareous, and it weathers to a reddish-brown color. In contrast to the Mottled Blue-Gray Fossiliferous type, this type is much less frequent at the Ducks Nest site, comprising 3 percent of the chipped stone sub-assemblage.

I. White Fossiliferous Chert

As with the previous two types, this material probably derives from local Mississippian Warsaw Formation exposures. Aside from the basic difference in color, however, this type contains a much more dense concentration of larger fossil fragments. It is tabular, exhibits a reddish-brown weathered rind, and is medium to coarse-grained. At the Ducks Nest site this material is sixth in order of abundance, representing 8 percent of the total chipped stone sub-assemblage.

J. Light Tan Tabular Chert

This chert varies from medium to very coarse-grained, but displays a uniformity in light tan color throughout. It does not have a close corollary in any previously described type, and at the macroscopic level appears to share characteristics with both the Warsaw and Fort Payne cherts described above. Consequently, its geological origin remains unknown. At the Ducks Nest site it is an insignificant type, accounting for less than 1 percent of the total chipped stone raw material.

K. Coarse-Grained Multi-Colored Chert

In all probability this material belongs with the varieties of blue-gray and tan Fort Payne chert. It is a tabular coarse-grained chert that is predominantly tan, but is mottled blue-gray and reddish-brown. Although the multiplicity of colors is a distinguishing characteristic, an additional identifying trait is the presence of white to light blue linear agatized inclusions. Less than 1 percent of the chipped stone recovered at the Ducks Nest site is of this material.

L. Blue-Gray Nodular Chert

This material has not been previously described but is probably a variety of Mississippian St. Louis nodular chert. In texture it is uniformly fine-grained, and it is light blue-gray speckled with minute darker blue-gray inclusions. It has a thick calcareous cortex which is generally underlain by a thin (1-2mm) reddish-brown subcortex. The subcortex, however, is not a universal trait. Some specimens lack it entirely, while in others it is present only discontinuously. Although this material was probably available locally, at 2 percent of the total chipped stone sub-assemblage, it was not abundant at the Ducks Nest site.

M. Gray Nodular Chert

A chert virtually identical to this type has recently been described in collections from the Hillsboro Locality by Penny and McCollough (1976: 180). It is a homogeneous medium-gray opaque fine-grained nodular chert which has a thick gray calcareous cortex. It is derived from Mississippian St. Louis formation deposits and is considered a variant of the type Blue-Green Nodular (see below). Unlike the Hillsboro Locality specimens, however, most specimens from the Ducks Nest site have no thin brown subcortex band. At the Ducks Nest site this material is a relatively important constituent, accounting for 9 percent of the total chipped stone raw material.

N. Blue-Green Nodular Chert

This chert ranges from bright blue-green to lighter shades of that color. It is very fine-grained, vitreous, and occurs in a variety of nodular forms, although small 4 to 8 inch diameter spherical nodules are the most common. It has a cortex which is thick and calcareous and is typically underlain by a thin (1-2mm) tan to brown subcortex band. This chert is well documented from Mississippian St. Louis Formation deposits. In their discussion of this type, Penny and McCollough (1976: 179) state that sources of blue-green nodular chert are probably present in a zone along the eastern edge of the Highland Rim extending for an undetermined distance northward from the Hillsboro Locality. At the Ducks Nest site blue-green nodular chert is the second most abundant raw material represented in the chipped stone sub-assemblage (13 percent), indicating that sources of it were locally available and intensively utilized.

O. Dark Gray Vitreous Chert

Although this material is generally very fine-grained it actually consists of a vitreous dark gray chert matrix interlaced with distinctive tan non-siliceous linear and irregularly shaped inclusions. Consequently, it fractures unpredictably and its low frequency (less than 1 percent) at the Ducks Nest site is understandable in view of its poor knapping quality. Neither the form nor geologic derivation of this material are known.

P. Mat Gray Nodular Chert

This material is homogeneously fine-grained and uniformly medium gray. In many ways it resembles the type Gray Nodular described above. However, in contrast to that type it is characterized by a very dull surface luster and a thick cortex which is a tan siliceous material (rather than calcareous as with the Gray Nodular type) only slightly more coarse-grained than the interior chert. In addition, there is no subcortex band present. The geologic derivation of this chert is unknown, although its general characteristics suggest the Mississippian St. Louis Formation. At the Ducks Nest site it is a low frequency type, representing only 1 percent of the chipped stone sub-assemblage.

Q. Gray-Blue Chert with Speckle Inclusions

This material is uniformly fine-grained and medium gray-blue. It contains a small number of minute evenly distributed light gray inclusions which gives it a distinctive speckled appearance. This type has not been described elsewhere and consequently neither the form (since such a small sample was recovered at the Ducks Nest site) nor geologic origin are known. It is one of seven chipped stone raw material types represented by less than 1 percent at the Ducks Nest site.

R. Medium-Dark Gray Chert, White Siliceous Cortex

The principal distinguishing characteristic of this material is the white to cream colored siliceous cortex which surrounds interior chert that is highly mottled medium-dark gray. Both interior chert and cortex are fine-grained. Although nodular, the geologic origin of this chert is unknown. It accounts for less than 1 percent of the raw materials in the chipped stone sub-assemblage.

S. Tan and White Mottled Chert

This type undoubtedly represents a predominantly white to cream colored variety of Fort Payne chert. Aside from color, it is in all characteristics comparable to those types described above. In the site chipped stone sub-assemblage it accounts for 2 percent of the total, and a high proportion of this appears to have been thermally altered.

T. Other Cryptocrystaline Quartz

Type T represents a catch-all category for specimens that did not conform to any of the 19 types described above. A constituent of this category, although the entire category accounts for less than 1 percent of the chipped stone sub-assemblage, is Gray Banded chert (as described by Faulkner and McCollough 1973: 53-54; and further discussed by Penny and McCollough 1976: 158-174). Since this chert is derived from Ordovician deposits, it is not common in the Eastern Highland Rim. The closest known exposure is in the Normandy Reservoir precinct approximately 30 miles southwest of the Ducks Nest site.

Ground stone raw materials. Eleven ground stone artifacts were recovered at the Ducks Nest site. Of these, eight are sandstone, two are unidentified igneous rock, and one is soapstone. Sandstone would have been locally available, either from the Warsaw Formation or the Pennsylvanian sandstones of the Cumberland Plateau. The igneous rock and soapstone, however, had to have been imported from a considerable distance outside the area. The southern end of the Blue Ridge or Piedmont physiographic provinces are the most likely source areas for igneous rock. Although the soapstone could have come from the same area, it also could have been obtained in northern Georgia and Alabama (Faulkner and McCollough 1973: 59).

Discussion

The inhabitants of the Ducks Nest site utilized a wide variety of cherts. Until surveys are conducted with the express purpose of locating prehistoric quarries and natural exposures of chert in the immediate vicinity of the Ducks Nest site, however, little can be said regarding specific procurement localities. Given the fact that the geologic formations in the area contain abundant chert-bearing deposits, it is probable that virtually all of the chert recovered at the Ducks Nest site was derived from local sources. A number of the chert types identified are sufficiently distinctive, well studied (admittedly in other areas), and abundant at the Ducks Nest site to demonstrate that no specific type of chert was singled out above all else. Instead, cherts attributable to Fort Payne, Warsaw, and St. Louis formation deposits are all well represented. Extracting those types which can, with reasonable certainty, be attributed to one of these three formations reveals that Fort Payne cherts (comprising Types C, D, K, and S) are more abundant than either Warsaw (Types G, H, and I) or St. Louis (Types L, M, and N) formation types. The relative frequencies of these raw material type clusters are 35, 24, and 24 percent, respectively. This observation has implications for the chert procurement strategy practiced at the Ducks Nest site. Fort Payne Formation deposits are not widely exposed in the area. Instead they are limited to the lower elevations in the valleys of the more deeply incised rivers and streams. The higher relative frequency of Fort Payne chert, therefore, may indicate that the valley floor was an important lithic resource zone. In addition to the exposure of Fort Payne deposits, river erosion has also produced steep bluffs rising abruptly above the valley floors. Warsaw and St. Louis cherts would have been accessible from these bluff exposures or from talus and river gravel deposits. The number of specimens exhibiting weathered and water worn surfaces at the Ducks Nest site suggest that most chert was procured from gravel deposits. This does not rule out the possibility that Warsaw and St. Louis cherts were procured elsewhere, but upland sources of these cherts may, to a large extent, have been masked by soil development and vegetation cover.

Sandstone was the principal material employed to make ground stone implements. All eight sandstone artifacts recovered are a fine- to medium-grained material which was probably derived from local Warsaw deposits. None of the specimens contain quartz pebble inclusions which would indicate their procurement from the conglomeratic sandstone of the Cumberland Plateau escarpment (cf. Faulkner and McCollough 1973: 58). The remaining three ground stone specimens, two of igneous rock and one of soapstone, were undoubtedly obtained from outside of the immediate area. It is possible, however, that neither the igneous nor soapstone artifacts are associated with the Mississippian component at the Ducks Nest site.

C. Lithic Artifacts

A total of 5703 lithic artifacts was recovered at the Ducks Nest site. Most (99.8 percent) are chipped stone artifacts and the by-products of their manufacture. Table 3 provides summary data by raw material while Tables 4, 5, and 6 provide provenience distribution and Tables 7, 8, and 9 provide raw material distribution by provenience. The remaining 0.2 percent are ground stone artifacts. In the following discussion a descriptive typology based upon recurring sets of morphological attributes is employed as the organizational framework. By in large the classes/types discussed below reflect variations in technological and/or stylistic attributes. For example, the class "debitage," composed of the by-products of chert knapping activities, is subdivided on the basis of attributes thought to reflect specific stages in a lithic reduction sequence and changes in knapping technique through that sequence (cf. Bradley 1975). On the other hand, the class "projectile points/knives" is subdivided on the basis of stylistic attributes. As with most of the typological constructs employed for description of lithic sub-assemblages in the southeast, traditional terminology has been retained in this analysis. It should be noted, however, that although certain terms carry specific functional connotations, in virtually no case has adequate research been conducted to demonstrate that these are accurate. Consequently, comments made below regarding tool use should be viewed as assumptions in need of testing.

Since the manufacture of any lithic artifact involves the attritional reduction of the raw material being modified, the following

TABLE 3. Chipped Stone Artifacts by Raw Material (Excluding Projectile Points/Knives).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	Total	Percent
Hammerstone	1		1																		2	*
Multi-directional Core	3	1	4	7	11	2	4	4	1			1	5	5		2					50	0.9
Flat Core			1		2			2	1					1							7	0.1
Discoidal Core			2						1	1		1		1							6	0.1
Subconical Core														1							1	*
Primary Decortication Flake	1	1	35	9	25	3	11	8	19	3	3	5	10	21		4				1	159	2.8
Secondary Decortication Flake	4		65	19	39	3	18	12	21	2	2	13	35	84	2	6	1	1	4	3	334	5.8
Interior Flake	16	1	190	67	125	12	84	23	51	1	2	17	48	90	1	26	1	1	19	2	777	13.6
Bifacial Thinning Flake	9	3	431	116	159	31	195	28	132	3		41	159	220		20	2	7	54	3	1613	28.3
Blade/Blade-Like Flake									1					3					2		6	0.1
Bipolar Debitage			1					1						2		1		1			6	0.1
Unidentifiable Flake Fragments	9	2	624	172	247	23	362	85	230	7	11	28	246	278	3	27	1	2	56	3	2416	42.4
Side Scraper			2	2	2				1			1						1			9	0.2
End Scraper			2		1																3	0.1
Spokeshave								1						1		1					3	0.1
Denticulate							1						1	2							4	0.1
Perforator													1								1	*
Combination Tools			1					1						1							3	0.1
Utilized Flake-Unifacial	1		28	11	19	2	5	5	9			2	11	19	2	1			5		120	2.1
Utilized Flake-Bifacial			3	1	2		1		2				1	4						2	16	0.3
Thick Biface/Knife	1		3	2					3					1				1		1	12	0.2
Thin Biface/Knife			7	4	1			1		1			1								15	0.3
Chopping Tool	2				2																4	0.1
Core Tool/Scraper Chopper					2				2					2							6	0.1
Drill			1																		1	*
Digging Tool/Hoe--(Limestone)	1																				1	*
Adze			1		1																2	*
Misc. Bifacial Objects							1						1								2	*
TOTAL	47	8	1402	410	638	76	682	171	474	18	18	109	519	736	8	88	5	14	141	14	5579	
PERCENT	1	*	25	7	11	1	12	3	8	*	*	2	9	13	*	2	*	*	3	*		

*Present, less than 1 or 0.1 percent.

TABLE 4. Chipped Stone Artifacts Recovered from Features (Excluding Projectile Points/Knives).

Provenience	Hammerstone	Multi-directional Core	Flat Core	Discoidal Core	Subconical Core	Primary Decortication Flake	Secondary Decortication Flake	Interior Flake	Bifacial Thinning Flake	Blade/Blade-like Flake	Bipolar Debitage	Unidentifiable Flake Fragments	Shatter (in grams)	Side Scraper	End Scraper	Spokeshave	Denticulate	Perforator	Combination Tools	Utilized Flake--Unificial	Utilized Flake--Bifacial	Thick Biface/Knife	Thin Biface/Knife	Chopping Tool	Core Tool--Scraper	Drill	Digging Tool--Hoe	Adze	Miscellaneous Bifacial Objects	Total
Feature 1						53	70	121	348	1		454		1						15	5	1								1069
Feature 2		4				3	4	10	20	1	1	32								3										78
Feature 4	1	2				4	14	59	112	1		195	53.7							6	1		1				1			397
Feature 5		2				1	3	10	23			22	5.7							2			1							64
Feature 76-3		2				1	19	20	10		27	5.4								1										80
368N70W Structure 2 Wall Trench Fill		1																												1
368N72W Structure 2 Wall Trench Fill								1																						1
370N72W Structure 2 Wall Trench Fill								2	3			2								1										8
372N68W Structure 2 Wall Trench Fill								1	7			11	2.2																	19
372N72W Structure 2 Wall Trench Fill								1																						1
376N66W Structure 2 Wall Trench Fill		1				1		1																						3
376N68W Structure 2 Wall Trench Fill							2	2				1																		5
TOTAL	1	12				63	112	228	523	3	1	744	67.0	1						28	6	1	2				1			1726

TABLE 5. Chipped Stone Artifacts Recovered from Postholes (Excluding Projectile Points/Knives).

Posthole No.	Hammerstone	Multi-directional Core	Flat Core	Discoidal Core	Subconical Core	Primary Decortication Flake	Secondary Decortication Flake	Interior Flake	Bifacial Thinning Flake	Blade/Blade-like Flake	Bipolar Debitage	Unidentifiable Flake Fragments	Shatter (in grams)	Side Scraper	End Scraper	Spokeshave	Denticulate	Perforator	Combination Tools	Utilized Flake--Unifacial	Utilized Flake--Bifacial	Thick Biface/Knife	Thin Biface/Knife	Chopping Tool	Core Tool--Scarper	Drill	Digging Tool--Hoe	Adze	Miscellaneous Bifacial Implement	Total
2(FS)*							1	1	5			8	1.6																	15
3(FS)								2	7			1	.9						1											11
4				1																										1
5(FS)								2	4			4	.7																	10
7							1																							1
9(FS)						1	1	1	9			13	1.5																	25
11												1																		1
13(FS)								5	5			3	.5																	13
16(FS)						1		2	8			9	2.1																	20
17									1																					1
18								1																						1
20									1																					1
21(FS)						1		2	4			7	1.1																	14
24											1																			1
25(FS)							1					1	.4																	2
26(FS)									1			4	.5																	5
27(FS)							1					2	1.1																	3
43(FS)								2	7			10	1.6																	19
45(FS)							1	1	4			8	2.2									1								15
46(FS)						1	1	2	6			11	2.1																	21
47								1																						1
48(FS)							1	3	7			9	1.3																	20
49(FS)								5	6			4	1.7																	15
53							1																							1
61(FS)								1	3			4	.4																	8
72(FS)							1	2				3	.4																	6
76												2																		2
77(FS)							1		5			4	1.2																	10
78								1				1											1							3
80(FS)									2			4	.6																	6
84(FS)						1		3	5			11	.5																	20
85(FS)						1	1		6			5	1.2																	13
90							1																							1
92		1										1																		2
96(FS)						2			6			9	1.0																	17
99(FS)						1		3	8		2	9	2.1						1											24
101(FS)								1	9			8	.6																	18
107							1		1			1																		3
111													.3																	X
112(FS)								4	8			12	1.6																	24
113(FS)						1			11			22	1.7																	34
114(FS)								1	7			5	1.2																	13
120		1																												1
123							1																							1
124																				1										1
127(FS)		1					1	1	15			19	3.4																	37
131(FS)							1	6	3			12	.9							1										23
144							2	3				1																1		7
145												1																		1
147		1																												1
148									1			1																		2
149						1	5	5	2			3																		16
150						1	1	1	1																					4
TOTAL		4		1		12	25	62	168		3	233	36.4						2	2		1	1					1		515

*FS = flotation sample.

TABLE 6. Chipped Stone Artifacts Recovered from Unit Levels (Excluding Projectile Points/Knives).

Provenience	Hammerstone	Multi-Directional Core	Flat Core	Discoidal Core	Subconical Core	Primary Decortication Flake	Secondary Decortication Flake	Interior Flake	Bifacial Thinning Flake	Blade/Blade-Like Flake	Bipolar Debitage	Unidentifiable Flake Fragments	Shatter (in grams)	Side Scraper	End Scraper	Spokeshave	Denticulate	Perforator	Combination Tools	Utilized Flake—Unifacial	Utilized Flake--Bifacial	Thick Biface/Knife	Thin Biface/Knife	Chopping Tool	Core Tool--Scraper	Drill	Digging Tool--Hoe	Adze	Miscellaneous Bifacial Objects	Total
366N66W PZ		1							1			2		1						3										8
366N68W PZ		1				1	1	5	1											2	1									12
366N70W PZ																				1										1
368N66W PZ								6	2			2		1						1					1					13
368N68W PZ		5		1		2	5	6	4			8					1			4										36
368N68W 20-30cm			1				1	1																						3
368N70W PZ																							1							1
368N70W 20-30cm						3	3	3	2			2												1						14
368N70W (SE1/4) 20-30cm (FS)*						6	9	17	63			85	14.3		1					2	1									184
368N70W (NE1/4) 20-30cm (FS)		1	1			2	12	27	88			90	8.0	1						3										225
368N72W PZ		1																		1										2
368N74W PZ		1					1	3	5			2				1														13
370N64W PZ																										1				1
370N66W PZ						1		3				4								3				1	1					13
370N68W PZ							1	1	3			2											1							8
370N68W 20-30cm		1				1	2	12	10		1	6								1			1						1	36
370N68W (SE1/4) 20-30cm(FS)						5	7	20	52			99	38.7							4										187
370N70W PZ				1		1						1																		3
370N70W 20-30cm		3				6	13	19	16			16		1						5	1		2	1						83
370N72W PZ						1	2	5	1			3		1						2	1									16
370N72W 20-30cm						1		2																						3
370N72W (NE1/4) 20-30cm (FS)		1				3	4	24	33	1		61	15.3							2										129
370N74W PZ							5	7	3	1		6				1	1													24
372N64W PZ		1					2					1							1	1										6
372N66W PZ		1			1		6	3	1			5								2		1	2							22
372N66W 20-30cm	1	2					1	6	3			3								1			1							18
372N68W PZ		1	1				1																							3
372N68W 20-30cm (FS)		1				7	13	35	90			124	51.3							3			2							275
372N70W PZ						3	5	6	9			17								3										43
372N70W 20-30cm						2	2	8	10			18								1		1								42
372N70W 20-30cm (FS)						2	4	15	42			100	28.0																	163
372N70W 20-30cm (FS)						4	7	24	59			78	29.5									1								173

TABLE 6. (continued)

Provenience	Hammerstone	Multi-Directional Core	Flat Core	Discoidal Core	Subconical Core	Primary Decortication Flake	Secondary Decortication Flake	Interior Flake	Bifacial Thinning Flake	Blade/Blade-Like Flake	Bipolar Debitage	Unidentifiable Flake Fragments	Shatter (in grams)	Side Scraper	End Scraper	Spokeshave	Denticulate	Perforator	Combination Tools	Utilized Flake--Unifacial	Utilized Flake--Bifacial	Thick Biface/Knife	Thin Biface/Knife	Chopping Tool	Core Tool--Scraper	Drill	Digging Tool--Hoe	Adze	Miscellaneous Bifacial Objects	Total
372N70W 20-30cm (FS)		1	1			9	7	32	59			93	19.3							1										203
372N72W PZ							1	5	1													1								8
372N72W 20-30cm (FS)						3	5	6	25			27	19.7							4										70
372N74W PZ								1	1																					2
372N74W 20-30cm							1	2																						3
374N62W PZ		1																							1					2
374N64W PZ							1	4	2			1			1			1		1										11
374N66W PZ			1			1	2	6	5			9								1		1								26
374N66W 20-30cm							1	2	1			9																		13
374N68W PZ							1	1	2			6								1										11
374N68W 20-30cm							6	6	10			9		1		1				2		1								36
374N68W 20-30cm (FS)						2	3	10	23			54	13.5		1					1										94
374N70W PZ							1	3	2			4																		10
374N70W 20-30cm						1	2	4	13	1		23																		44
374N70W 20-30cm (FS1)							2	12	56			51	12.0																	121
374N70W 20-30cm (FS2)						2		9	32			74	44.6							1										118
374N70W 20-30cm (FS3)						2	8	14	37		1	66	9.6																	128
374N70W 20-30cm (FS)						1	3	16	20			36	15.6								1									77
374N72W PZ							2	2	3			6								2	1	1			1					18
374N72W 20-30cm						1	1	3				4					1			1										11
376N64W PZ			1				3	3	1											3				1						12
376N66W PZ		2		1		1	3	9	4			13					1			4	3									41
376N66W 20-30cm			1			1	6	14	19			15								4		1								61
376N68W PZ												1								1										2
376N68W 20-30cm (FS)		5		1		2	10	28	25			41								8		1	1		1			1	1	125
376N70W PZ						1	3	3	3			8		2						1	1									22
376N70W 20-30cm		1		1		3	5	3	2			3								2		1	1							22
378N66W PZ		1						1												1					1					4
378N66W 20-30cm							1	2												1										4
378N66W 20-30cm (FS)						2	7	12	37			74	10.0							2										134
378N68W 20-30cm		2				1	1		1			2								1										8
378N68W (N1/2) 20-30cm (FS)							1	3	7			8	3.4																	19
378N68W (S1/2) 20-30cm (FS)							2	6	12			33	5.3																	53
378N70W (S1/2) 20-30cm								2												2										4
378N70W (SE1/4) 20-30cm (FS)							1	5	21			34	4.0																	61
TOTAL	1	34	7	5	1	84	197	487	922	3	2	1439	342.1	8	3	3	4	1	1	90	10	10	12	4	6	1		1	2	3338

*FS = flotation sample.

TABLE 7. Raw Material Distribution of Chipped Stone Artifacts Recovered from Features (Excluding Projectile Points/Knives).

	RAW MATERIAL																				
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	Total	Percent
Hammerstone			1																		1	0.1
Multi-Directional Core	1		2	1	2	1	1						2	2							12	0.7
Flat Core																						
Discoidal Core																						
Subconical Core																						
Primary Decortication Flake			14	1	7	1	4	2	14		2	2	7	7		2					63	3.7
Secondary Decortication Flake	1		30	11	17		4		1				13	30		1			1	3	112	6.5
Interior Flake	4		50	16	44	1	31	6	7		1	5	10	33		12			7	1	228	13.2
Bifacial Thinning Flake			83	33	96	16	101		12			10	42	92		4			34		523	30.3
Blade/Blade-Like Flake									1					2							3	0.2
Bipolar Debitage														1							1	0.1
Unidentifiable Flake Fragments			141	36	88		197	22	28		8	9	81	106		14			14		744	43.1
Side Scraper				1																	1	0.1
End Scraper																						
Spokeshave																						
Denticulate																						
Perforator																						
Combination Tools																						
Utilized Flake-Unifacial			7	1	4	1		1					1	8		1			4		28	1.6
Utilized Flake-Bifacial			1				1		1					2						1	6	0.3
Thick Biface/Knife			1																		1	0.1
Thin Biface/Knife				1									1								2	0.1
Chopping Tool																						
Core Tool/Scraper																						
Drill																						
Digging Tool/Hoe (Limestone)	1																				1	0.1
Adze																						
Misc. Bifacial Objects																						
TOTAL	6		330	101	258	20	339	31	64		11	26	157	283		34			60	5	1726	100.2
PERCENT	*		19	6	15	1	20	2	4		1	2	9	16		2			3	*		100

*Present, less than 1 percent.

TABLE 8. Raw Material Distribution of Chipped Stone Artifacts Recovered from Postholes (Excluding Projectile Points/Knives).

	RAW MATERIAL																					
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	Total	Percent
Hammerstone																						
Multi-Directional Core	1				1								1	1							4	0.8
Flat Core																						
Discoidal Core									1												1	0.2
Subconical Core																						
Primary Decortication Flake	1		1	2	3		1	2	1							1					12	2.3
Secondary Decortication Flake			2		5	1	3	2			1	1	8	1			1				25	4.9
Interior Flake	2		9	3	10	3	6	5	5	1		2	9	5		1			1		62	12.0
Bifacial Thinning Flake	2	2	48	4	25	9	19	3	6	1		1	29	13		1	1		4		168	32.6
Blade/Blade-Like Flake																						
Bipolar Debitage			1					1						1							3	0.6
Unidentifiable Flake Fragments			59	3	34	8	35	14	18	1		1	27	22		4	1		5	1	233	45.2
Side Scraper																						
End Scraper																						
Spokeshave																						
Denticulate																						
Perforator																						
Combination Tools								1						1							2	0.4
Utilized Flake-Unifacial			1		1																2	0.4
Utilized Flake-Bifacial																						
Thick Biface/Knife				1																	1	0.2
Thin Biface/Knife								1													1	0.2
Chopping Tool																						
Core Tool/Scraper																						
Drill																						
Digging Tool/Hoe																						
Adze					1																1	0.2
Misc. Bifacial Objects																						
TOTAL	6	2	121	13	80	21	64	29	31	3	1	5	74	44		7	3		10	1	515	99.4
PERCENT	1	*	23	3	16	4	12	6	6	1	*	1	14	9		1	1		2	*		100

*Present, less than 1 percent.

TABLE 9. Raw Material Distribution of Chipped Stone Artifacts Recovered from Unit Levels (Excluding Projectile Points/Knives).

	RAW MATERIAL																					
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	Total	Percent
Hammerstone	1																				1	*
Multi-Directional Core	1	1	2	6	8	1	3	4	1			1	2	2		2					34	1.0
Flat Core			1		2			2	1					1							7	0.2
Discoidal Core			2							1		1		1							5	0.1
Subconical Core														1							1	*
Primary Decortication Flake		1	20	6	15	2	6	4	4	3	1	3	3	14		1			1		84	2.5
Secondary Decortication Flake	3		33	8	17	2	11	10	20	2	1	12	14	53	2	5		1	3		197	5.9
Interior Flake	10	1	131	48	71	8	47	12	39		1	10	29	52	1	13	1	1	11	1	487	14.6
Bifacial Thinning Flake	7	1	300	79	38	6	75	25	114	2		30	88	115		15	1	7	16	3	922	27.6
Blade/Blade-Like Flake														1					2		3	0.1
Bipolar Debitage																1		1			2	0.1
Unidentifiable Flake Fragments	9	2	424	133	125	15	130	49	184	6	3	18	138	150	3	9		2	37	2	1439	43.1
Side Scraper			2	1	2				1			1						1			8	0.2
End Scraper			2		1																3	0.1
Spokeshave								1						1		1					3	0.1
Denticulate							1						1	2							4	0.1
Perforator													1								1	*
Combination Tools			1																		1	*
Utilized Flake-unifacial	1		20	10	14	1	5	4	9			2	10	11	2				1		90	2.7
Utilized Flake-Bifacial			2	1	2				1				1	2						1	10	0.3
Thick Biface/Knife	1		2	1					3					1				1		1	10	0.3
Thin Biface/Knife			7	3	1					1											12	0.4
Chopping Tool	2				2																4	0.1
Core Tool/Scraper					2				2					2							6	0.2
Drill			1																		1	*
Digging Tool/Hoe																						
Adze			1																		1	*
Misc. Bifacial Objects							1						1								2	0.1
TOTAL	35	6	951	296	300	35	279	111	379	15	6	78	288	409	8	47	2	14	71	8	3338	99.8
PERCENT	1	*	28	9	9	1	8	3	11	*	*	2	9	12	*	1	*	*	2	*		96

*Present, less than 1 or 0.1 percent.

discussion progresses from a consideration of the by-products resulting from tool manufacture to the formal artifacts produced. In the Ducks Nest lithic sub-assemblage debitage accounts for 93 percent, chipped stone tools for 6.8 percent, and ground stone implements for 0.2 percent.

D. Debitage

The manufacture of chipped stone artifacts typically produces a large quantity of waste chippage, or debitage. At the Ducks Nest site seven categories of debitage were identified, accounting for 93 percent of the chipped stone sub-assemblage. These represent discrete stages in the reduction of a mass of raw material to the production of a finished artifact, and are discussed below in that order. In addition, hammerstones and cores are also discussed. Two percentages are presented below: one corresponding to the relative frequency with the entire lithic sub-assemblage, the other corresponding to the relative frequency within the class "debitage."

Primary Decortication Flakes

n	Sub-Assemblage Frequency	Debitage Frequency
159	2.8%	3.0%

Primary decortication flakes are flakes on which the entire dorsal, or outer, surface is covered by natural cortex or is worn such as would result from water transport. In addition, they are characterized by striking platforms which are broad and thick, and a flake angle which does not deviate greatly from 90°. Their production by means of direct hard hammer percussion is suggested. At 3 percent of the total debitage sample, primary decortication flakes are not abundant. However, in combination with secondary decortication flakes, their presence at the Ducks Nest site is informative (see below).

Secondary Decortication Flakes

n	Sub-Assemblage Frequency	Debitage Frequency
334	5.8%	6.3%

Secondary decortication flakes represent flakes which, except for retaining only a partial cover of cortex on the dorsal surface, are indistinguishable from primary decortication flakes. With respect to the initial stages of virtually any lithic reduction sequence a proportional increase in quantity of secondary over primary decortication flakes is expected. It can be argued that the frequency of decortication flakes provides a measure of proximity between site and raw material source; a high frequency indicating close proximity between site and source, and a low frequency indicating distant removal of site from source. The combined frequency of decortication flakes at the Ducks Nest site is 9.3 percent of the total debitage. In conjunction with the fact that the ratio between decortication flakes and cores is 7.7:1, this suggests that primary reduction knapping was to a large extent accomplished on site and, concomitantly, that sources of raw material were readily accessible nearby.

Interior Flakes

n	Sub-Assemblage Frequency	Debitage Frequency
777	13.6%	14.6%

Interior flakes represent flakes which were detached by direct hard hammer percussion from a core from which all cortical material had been previously removed. In a hypothetical lithic reduction sequence proceeding from initial removal of cortex, interior flakes represent an end point, at least in terms of direct hard hammer percussion. Lack of cortex on the dorsal surface, however, is not a sufficient criterion for assigning specimens to this category. In addition they exhibit striking platforms which are wide and thick, and flake angles which approach 90° but are generally somewhat less. Interior flakes are the second most abundant type of identifiable debitage at the Ducks Nest site.

Bifacial Thinning Flakes

n	Sub-Assemblage Frequency	Debitage Frequency
1613	28.3%	30.4%

From striking platform to distal end bifacial thinning flakes are typically expanded in form and thin. In addition, the striking platforms are faceted indicating removal from a bifacial blank and the flake angle is typically acute, with frequent lipping on the ventral platform margin. It is generally assumed that these flakes were produced by direct percussion with a soft hammer baton fabricator. At 10.4:1 the number of bifacial thinning flakes to bifacial implements at the Ducks Nest site is considered to be too low. In all likelihood, however, this reflects the fact that bifacial thinning flakes are prone to breakage both upon and subsequent to removal from the derivative biface. Consequently, many bifacial thinning flakes may not have been sufficiently complete to be identified and were, therefore, relegated to the category of unidentifiable flake fragments.

Blades/Blade-Like Flakes

n	Sub-Assemblage Frequency	Debitage Frequency
6	0.1%	0.1%

Systematic production of blades, flakes which are at least twice as long as they are wide and which have relatively straight parallel lateral margins and dorsal ridges, is a well studied aspect of lithic technology (Crabtree 1968; Bordes and Crabtree 1969; Sollberger and Patterson 1976). Although a variety of production techniques may be employed, blades are important for two principal reasons: (1) they represent very efficient use of raw material, and (2) they are very effective cutting/slicing implements because of their sharp acutely angled lateral margins. At the Ducks Nest site, however, blade production was not important. The small number of fragmented specimens recovered and the total lack of blade cores suggest that these were probably fortuitous--flakes produced inadvertently during other knapping processes. Consequently, the composite term "Blade/Blade-like Flake" is employed.

Bipolar Debitage

n	Sub-Assemblage Frequency	Debitage Frequency
6	0.1%	0.1%

The bipolar technique, essentially that of placing a piece of raw material on an anvilstone and then striking it with a hammerstone or other percussor from above (Binford and Quimby 1963; MacDonald 1968; Kobayashi 1975; Chapman 1975), results in the production of "splintered wedges," irregularly-shaped flakes with extremely marked undulations, "columnar spalls," and a large quantity of shatter. Of all knapping techniques it represents the least efficient use of raw material and produces the most unpredictable results. In certain situations, however, especially when the raw material available occurs in small pieces, it is a viable alternative to other knapping techniques. The low frequency of bipolar debitage at the Ducks Nest site indicates that this was not a significant factor.

Unidentifiable Flake Fragments

n	Sub-Assemblage Frequency	Debitage Frequency
2416	42.4%	45.5%

Most knapping techniques produce large quantities of shatter and flake fragments which are not sufficiently complete to be identified to specific technological categories. These generally comprise a high percentage of the total debitage in most collections. In Tables 4, 5, and 6 (pages 71, 72, and 73, respectively), unidentifiable flake fragments and shatter are recorded separately. The latter represents flakes and flake fragments less than .64cm in maximum dimension that were recovered from flotation samples and quantified by weight instead of count.

Hammerstones

n	Sub-Assemblage Frequency
2	less than 0.1%

Hammerstones are spherical to subspherical stones exhibiting wear attributable to battering. An apparent anomaly in the Ducks Nest assemblage is the virtual lack of hammerstones given the quantity of debitage and cores. Several factors could account for this--sampling error; the predominant use of antler billet and baton fabricators; or the "curation" (Binford 1973) of these when the site was abandoned. The first of these cannot be ruled out, but the recovery of a large quantity of debitage in Feature 1 and in midden samples across the excavation block indicates that knapping was an important activity in the area. The use of antler billets and batons is strongly suggested, but none were recovered in the strongly acid soil. Similarly curate behavior cannot be convincingly argued given the lack of data presently available from other Mississippian sites in the area. Of the two hammerstones recovered, one was from Feature 4 and the other was from the midden zone in Unit 372N66W.

Cores

n	Sub-Assemblage Frequency
64	1.1%

Four morphological types of cores, or masses of chert from which flakes had been detached, were identified (Table 3, page 70). Multidirectional cores, ones lacking a consistent flake removal orientation, were the most abundant, accounting for 78 percent of the total. Second in abundance, at 11 percent of the total, were flat cores. In all but one case these consisted of water worn rectanguloid slabs of tabular chert exhibiting flake removal along only one margin of one face. Discoidal cores, or cores biconvex in cross-section exhibiting flake removals converging to the center of each face, accounted for 9 percent of the total. Only one subconical core, representing 2 percent of the total, was recovered. This specimen is plano-convex in cross-section, formed by the convergence of flakes removed unifacially from the perimeter of a flat platform surface. Of the 64 cores recovered, 12 were from features, 5 were from postholes, and 47 were from unit level context.

Debitage Discussion

From the initial procurement and reduction of raw chert to the final manufacture of stone tools, the full range of expected knapping debris is present at the Ducks Nest site. Two principal knapping techniques, corresponding to major stages in the lithic reduction sequence, are represented. Direct hard hammer percussion was employed to remove the cortex from suitable chert masses and also to produce flakes for subsequent modification into tools. Direct soft hammer percussion, probably with antler billet and baton fabricators, was employed to thin and shape bifacial implements in the final stages of their manufacture. In addition to these techniques, bipolar knapping and pressure flaking were also practices, but neither is well represented at the site. The practice of pressure flaking is inferred from remnant flake scars on finished implements. It was an infrequently employed technique, however.

The presence and proportional increase in relative frequency of the various types of debitage identified support the contention that local sources of suitable chert were readily available. Adequate experimental data are not available to determine the expected frequency of primary and secondary decortication flakes given a specific raw material and knapping technique. However, at 7.7:1, the ratio of decortication flakes to cores at the Ducks Nest site is thought to be only slightly lower than expected given the hypothesis of on-site knapping of previously unmodified masses of raw material. This ratio is, in fact, higher for specific raw material types. Selecting Blue-Green Nodular chert (Type N) as an example, the ratio of decortication flakes to cores is 13.1:1.

E. Chipped Stone Tools

Fourteen types/classes of chipped stone tools, representing 5.5 percent of the total lithic sub-assemblage, were identified (Table 3, page 70). These are divisible into two major series. The uniface series is composed of seven types/classes, representing 2.5 percent of the total lithic sub-assemblage and 45.3 percent of the chipped stone tool sample. The biface series, composed of eight types/classes, accounts for 3.0 percent of the total lithic sub-assemblage and 54.6 percent of the chipped stone tool sample. Where possible, metric attributes are provided in the descriptions below. In addition, both the relative frequency in the total lithic sub-assemblage and within the specific series is provided for each type/class.

F. Uniface Series

Side Scrapers (Figure 14A)

n	Sub-Assemblage Frequency	Series Frequency
9	0.2%	6.3%

	Length (n=3)	Width (n=9)	Thickness (n=9)
Range	40.0-50.1mm	13.0-38.0mm	5.1-12.1mm
Mean	45.4mm	21.9mm	8.4mm

Side scrapers are flakes with working edges formed on lateral margins by a continuous line of relatively steep retouch. Five of these were made on interior flakes, three on decortication flakes, and one on a bifacial thinning flake. All exhibit steep retouch directed across the dorasl face from the ventral surface. Traditionally, side scrapers have been interpreted as butchering, hide working, and wood working implements involving the unidirectional movement of a scraping edge across the material being modified (House 1975: 63; Semenov 1964: 85-93). Eight of these were recovered from unit level context and one was recovered from Feature 4.

End Scrapers (Figure 14B)

n	Sub-Assemblage Frequency	Series Frequency
3	0.1%	2.1%

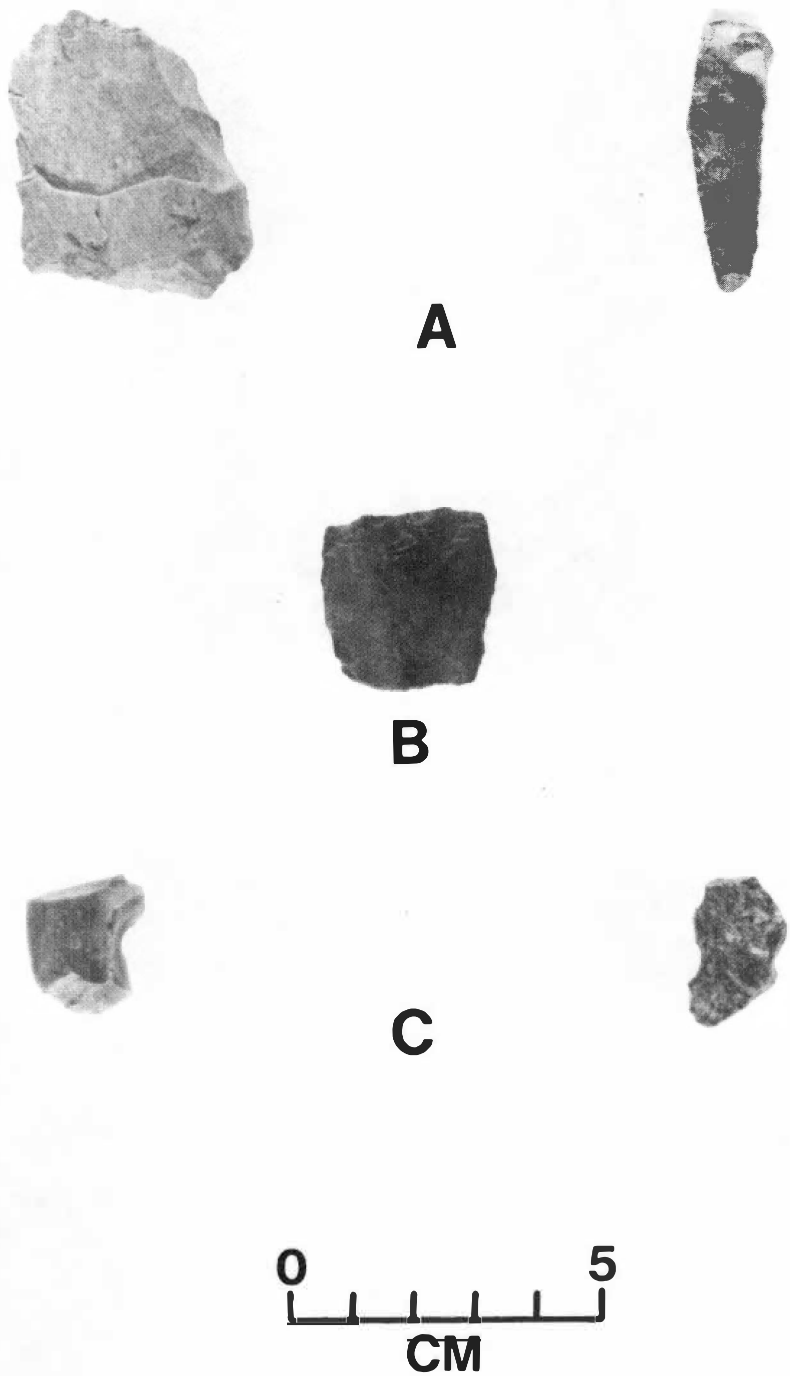

FIGURE 14. Unifacial implements: A. side scrapers; B. end scrapers; C. spokeshaves.

	Length (n=1)	Width (n=3)	Thickness (n=3)
Range	28.6mm*	13.1-28.2mm	5.0-8.0mm
Mean		20.5mm	6.6mm

End scrapers are flakes exhibiting steep distal margin retouch and/or use wear. While two specimens were made on interior flakes and one was on an unidentifiable flake fragment, each exhibits edge modification directed across the dorsal surface from the ventral face. It is generally inferred that end scrapers and side scrapers may be expected to occur in butchering and hide working tool kits (House 1975: 62). These specimens were recovered from unit level context in three widely separate excavation units.

Spokeshaves (Figure 14C)

n	Sub-Assemblage Frequency	Series Frequency
3	0.1%	2.1%

	Length (n=1)	Width (n=3)	Thickness (n=3)
Range	28.1mm	14.1-29.3mm	5.9-11.2mm
Mean		21.8mm	8.5mm

These artifacts are flakes which have a steeply retouched concavity formed in one or more of their margins. Although one of these specimens was made on an interior flake, it was not possible to determine the flake type derivation for the remaining two. Functionally, spokeshaves have been interpreted as scraping tools used in a unidirectional mode to form and smooth cylindrical objects of bone, wood, and antler--

tasks which might logically be associated with hunting and butchering activities (House 1975: 63-64), but which could be associated with others as well. All three specimens were recovered from widely separated unit level contexts.

Denticulates

n		Sub-Assemblage Frequency	Series Frequency
4		0.1%	2.8%

	Length (n=2)	Width (n=2)	Thickness (n=2)
Range	32.4-43.1mm	26.8-36.0mm	11.7-16.1mm
Mean	37.7mm	30.9mm	13.4mm

These specimens are flakes which have a series of adjacent marginal notches producing a jagged or serrated edge. Two were made on interior flakes, one on a decortication flake, and one on an unidentifiable flake fragment. The function of these artifacts is unknown, but thought to be associated with either plant processing--particularly shredding vegetal fiber--or coarse cutting/slicing (House 1975: 65). All four denticulates were recovered from unit level context.

Perforator

n		Sub-Assemblage Frequency	Series Frequency
1		less than 0.1%	0.7%

Length	Width	Thickness
X	15.2mm	7.3mm

This specimen is an interior flake which has a short pointed projection on its distal margin formed by converging lines of unifacial retouch. Perforators are generally thought to be associated with hide working or other fabricating tasks requiring light duty drilling and reaming (House 1975; 64). This specimen was recovered from the plow zone in Unit 374N64W.

Combination Tools

n	Sub-Assemblage Frequency	Series Frequency
3	0.1%	2.1%

Combination tools include: (1) an end scraper/graver fashioned on an interior flake, recovered from the plow zone in Unit 372N64W; (2) a spokeshave/side scraper made on a bifacial thinning flake, recovered from a posthole in the Structure 1 wall trench; and (3) a side scraper/end scraper, flake type derivation unknown, also recovered from a posthole in the wall trench of Structure 1.

Utilized Flakes

n	Sub-Assemblage Frequency	Series Frequency
120	2.1%	83.9%

These specimens are flakes which exhibit localized sections of unifacially directed marginal modification, not constituting retouch. Although these may represent suitable flakes that were utilized in a unidirectional scraping mode for only a short duration--the possibility also exists that they may have been accidentally produced. Although microscopic wear pattern analysis would also be needed, one way to test the hypothesis that these actually represent tools is to examine the flake type distribution with the null hypothesis expectation that all flake types should be represented in the proportion that they occur in the debitage. The flake type distribution is 26, 46, 21, and 27 for decortication flakes, interior flakes, bifacial thinning flakes, and unidentifiable flake fragments, respectively. A chi-square test applied to this class distribution resulted in a value significant at greater than the .001 level (x^2 = 84.4; df = 3). Consequently the null hypothesis (i.e., accidental production) can be rejected in favor of the hypothesis that there was selection of interior flakes for utilization. Of the 120 utilized flakes recovered, 28 were from feature context, 2 were from posthole context, and the remaining 90 were from unit level context.

G. Biface Series

Utilized Flakes

n	Sub-Assemblage Frequency	Series Frequency
16	0.3%	9.3%

These flakes exhibit consistent minute nibbling, or small flake removals generally along a single straight or convex edge indicating the application of pressure perpendicular to the margin. The nature of edge damage does not reflect intentional edge retouch. Instead, these flakes were probably utilized for only a short time in cutting and slicing activities, or were used on soft material that did not produce more extensive edge damage. Seven of them are decortication flakes, four are interior flakes, two are bifacial thinning flakes, and three are unidentifiable flake fragments. This pattern is essentially the reverse of what would be expected given the same hypothesis as expressed above for unifacially utilized flakes. Consequently, it is argued that decortication flakes were selected for use in light duty cutting/slicing activities. Of the 16 specimens recovered, 6 were from feature context and 10 were from unit level context.

Thick Biface/Knife (Figure 15A)

n	Sub-Assemblage Frequency	Series Frequency
12	0.2%	7.0%

	Length (n=4)	Width (n=4)	Thickness (n=4)
Range	54.1-74.7mm	31.2-47.2mm	14.1-28.1mm
Mean	68.4mm	37.9mm	19.9mm

This category and the one immediately following represent large, generally oval to sub-rectangular artifacts which have been formed by bifacial removals around the entire perimeter of the piece. The principal bifacial removals are large and deep-cutting, converging on each face to produce a pronounced median ridge and a concomitant biconvex to diamond-shaped cross section. They are thought to represent either: (1) bifaces in the early stages of thinning, or (2) heavy duty dutting implements (House 1975: 61). These interpretations, however, are not mutually exclusive (cf. Bradley 1975). Eight specimens are fragmentary, the majority exhibiting breakage due to lateral snap induced during manufacture. The remainder exhibit thermal or crenated fractures

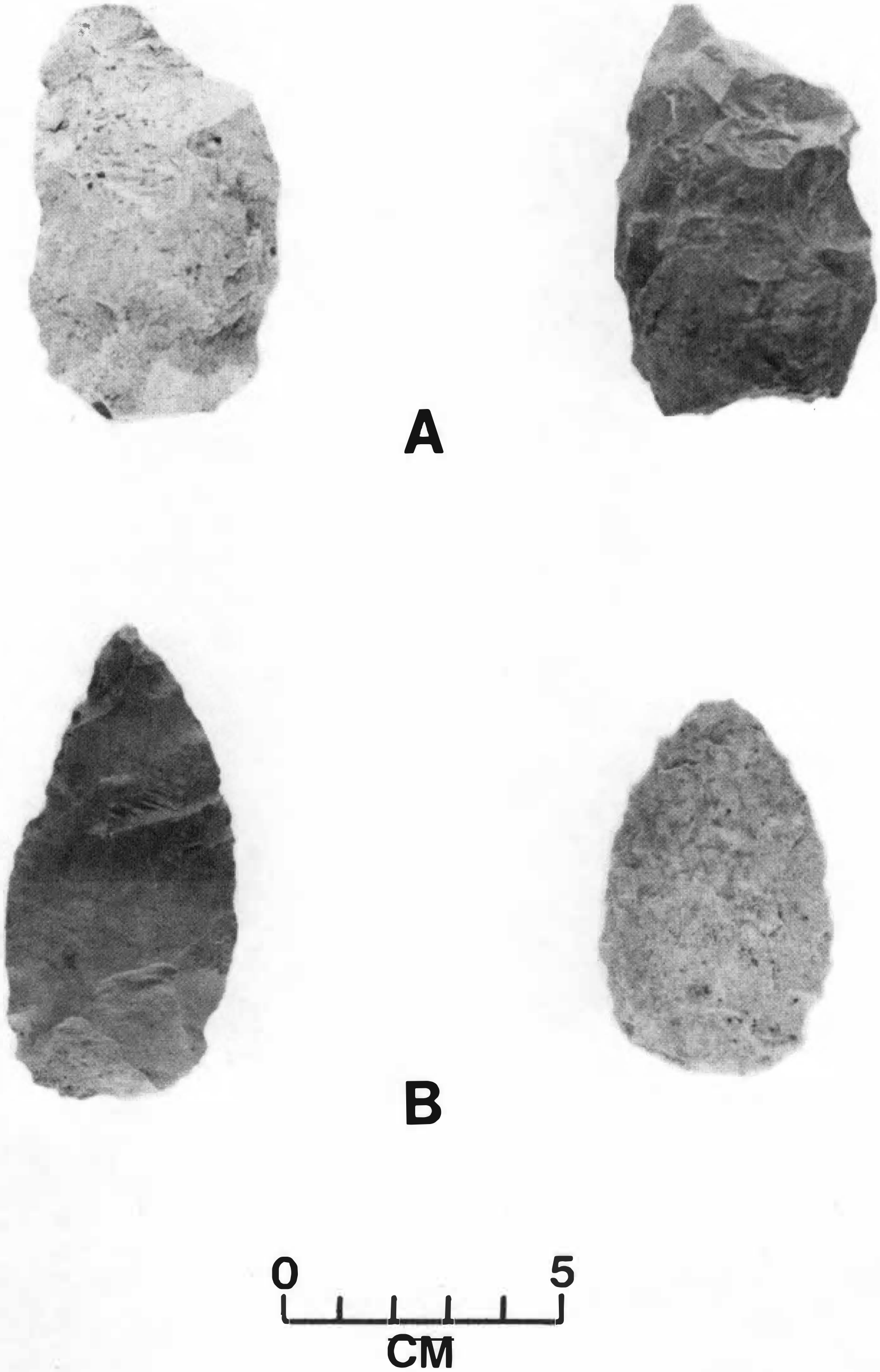

FIGURE 15. Bifacial implements: A. thick biface/knife; B. thin biface/knife.

(Purdy 1975). Although difficult to assess on the basis of the small sample recovered, large flakes appear to have been the blanks from which these were manufactured. Ten were recovered from unit level context, while one each of the remaining two were recovered from posthole and feature context.

Thin Biface/Knife (Figure 15B)

n	Sub-Assemblage Frequency	Series Frequency
15	0.3%	8.7%

	Length (n=5)	Width (n=5)	Thickness (n=5)
Range	52.9-85.5mm	35.3-42.1mm	8.4-12.2mm
Mean	70.3mm	39.1mm	10.2mm

The difference in thickness of these artifacts from those described above appears to stem from two sources. Not only do these exhibit greater refinement in thinning, reflected in a greater number of more resolved flake scars per face, but they also appear to have been made on flake blanks which were initially quite thin. These are typically oval to lanceolate in shape and biconvex to plano-convex in cross section. Again, most are fragmentary, exhibiting lateral snap. These artifacts were probably used in a variety of cutting and slicing activities, traditionally interpreted to be primarily associated with hunting and butchering (House 1975: 61). Twelve thin biface/knives were recovered from unit level context, two from feature context, and one from a posthole in the wall trench of Structure 1.

Chopping Tools

n		Sub-Assemblage Frequency	Series Frequency
4		0.1%	2.3%

	Length (n=2)	Width (n=2)	Thickness (n=2)
Range	74.8-78.1mm	51.9-63.4mm	25.7-29.2mm
Mean	76.4mm	57.6mm	27.4mm

Chopping tools represent large core or nucleiform pieces which exhibit bifacial removal of a small number of large flakes along a segment of their perimeter. None is complete. Two are vein quartz/chalcedony, a material which was selected in other localities for similar artifacts (Penny and McCollough 1976: 182). They were probably used in a variety of heavy duty chopping activities, possibly butchering and/or wood working (House 1975: 62). All four specimens were recovered from unit level context.

Core Tool/Scraper

n		Sub-Assemblage Frequency	Series Frequency
6		0.1%	3.5%

	Length (n=3)	Width (n=3)	Thickness (n=3)
Range	38.2-72.0mm	25.3-50.4mm	16.0-25.2mm
Mean	55.1mm	38.6mm	19.7mm

All of these artifacts are cores which exhibit bifacial edge damage along one or more margins formed by the intersection of two or more flake scars. The nature of edge damage indicates either a back-and-forth scraping motion or a chopping mode of use, but is not referable to platform preparation. All six were recovered from unit level context.

Drill

n	Sub-Assemblage Frequency	Series Frequency
1	less than 0.1%	0.6%

This artifact was recovered from the plow zone in Unit 370N64W. It consists of a laterally snapped distal tip fragment from an artifact that was rod-shaped and quadrilateral in cross-section. Use wear in the form of perpendicular marginal smoothing and abrasion is evident.

Digging Tool/Hoe (Figure 16)

n	Sub-Assemblage Frequency	Series Frequency
1	less than 0.1%	0.6%

This artifact was found among the stone slabs lining the floor of Feature 4. It is made of coarse-grained cherty fossiliferous limestone which was knapped into the desired form. Although the bit is broken, the artifact measures 20.15cm long, 13.1cm wide, and 2.8cm thick. Complete it was probably lanceolate to sub-rectangular. Both margins of the proximal section have broad shallow notches, 5.8-6.5cm wide and approximately 9mm deep, for hafting. The butt, however, is flat and unmodified. Artifacts similar to this are a constituent of most Mississippian assemblages and are traditionally interpreted as agricultural implements. However, they would have also served admirably for digging wall trenches and pit facilities.

FIGURE 16. Digging tool/hoe.

Adze (Figure 17)

n	Sub-Assemblage Frequency	Series Frequency
2	less than 0.1%	1.2%

These specimens are symmetrical sub-rectangular bifaces with slightly convex working edges formed on the broader of their shortest sides. Both exhibit minute flake removals and abrasion of their working edges indicating application of force perpendicularly to those margins. The smaller of the two specimens, measuring 57.3mm long, 27.4mm wide and 11.5mm thick, was recovered from the southernmost interior support post of Structure 1. The other was recovered from the midden zone in Unit 376N68W. It measures 88.1mm long, 42.0mm wide and 20.9mm thick. Adzes are assumed to be associated with wood working (House 1975: 61).

Miscellaneous Bifacial Artifacts

n	Sub-Assemblage Frequency	Series Frequency
2	less than 0.1%	1.2%

These artifacts represent unidentifiable fragments of bifacial implements. Both were recovered from unit level context.

H. Projectile Points/Knives

All bifacially chipped stone artifacts which are pointed on one end and which generally have a facility for hafting on the other were not necessarily used to tip projectiles (Ahler 1970). Consequently the composite term "projectile point/knife" is employed herein to acknowledge

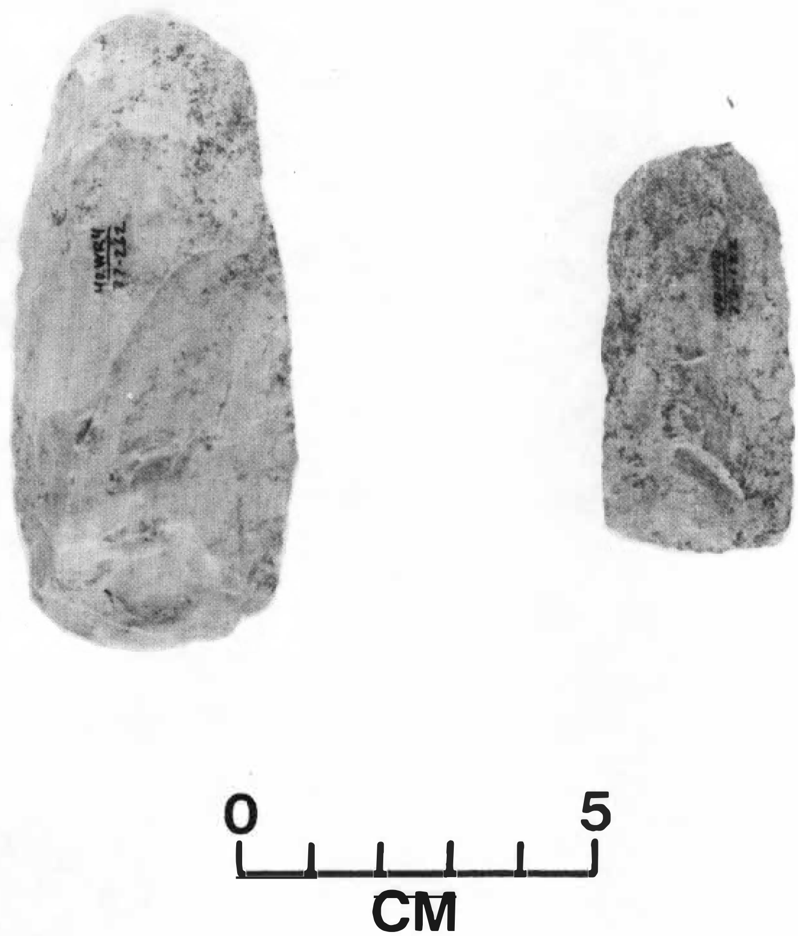

FIGURE 17. Adzes.

the probable inclusion of functionally distinct classes both among and within the morphological types described below.

As a class, projectile points/knives are a significant constituent in the Ducks Nest assemblage (Tables 10 and 11). One hundred and thirteen complete and fragmentary specimens were recovered, representing 2 percent of the total lithic sub-assemblage, 35.9 percent of all chipped stone implements, and 65.7 percent of the biface series. On the basis of recurring stylistic and technological configurations 50 of these were assignable to 12 morphological types, some of which have demonstrated culture historical significance in southeastern prehistory. The remaining 63 specimens are fragmentary and have been classified according to the fragment type represented with reference to a three part division: (1) unidentifiable basal fragments, (2) unidentifiable medial fragments, and (3) unidentifiable distal tips. In the discussions below each morphological type has been given a descriptive designation. In addition to presenting the sample size and the frequency of each type in the class "projectile points/knives," where possible basic metric attributes are provided and affiliations with named point types are discussed.

Small Triangular: n = 3 (Plus 8 Recovered in 1976; Figure 18A)

Relative frequency = 2.7%

	Length (n=3)	Width (n=10)	Thickness (n=10)
Range	27.5-36.0mm	14.3-21.8mm	3.0-6.7mm
Mean	30.5mm	17.2mm	4.8mm

TABLE 10. Provenience Distribution of Projectile Points/Knives.

Provenience	Small Triangular	Lanceolate Expanded Stemmed	Lanceolate Shallow Side Notched	Medium-Sized Triangular	Ovate Long Rounded Stemmed	Short Straight Stemmed Wide Blade	Corner Notched Rounded Stemmed	Medium-Large Straight Stemmed	Medium-Sized Corner Removed	Medium-Sized Corner Notched	Large Corner Notched	Large Side Notched	Unidentifiable Basal Fragments	Unidentifiable Medial Fragments	Unidentifiable Distal Tips	Total
366N66W PZ															1	1
366N68W PZ															1	1
368N66W PZ				1												1
368N68W PZ	1					1								1	1	4
368N68W 20-30cm														2	1	3
368N70W PZ		1						1							1	3
368N70W (SE1/4) 20-30cm (FS)*						1	1									2
368N70W (NE1/4) 20-30cm (FS)										1			1	1		3
368N72W PZ				1										1		2
370N64W PZ				1			1			1						3
370N66W PZ		1														1
370N70W 20-30cm						2								4		6
370N72W (NE1/4) 20-30cm (FS)										1						1
370N74W PZ			1													1
372N64W PZ														1		1
372N66W 20-30cm															1	1
372N68W 20-30cm (FS)		2														2
372N70W PZ														1	2	3
372N70W 20-30cm (FS) #1													1	2	1	4
372N70W 20-30cm (FS) #3						1		1						1		3
372N72W PZ				1					1							2
372N72W 20-30cm (FS)														2		2
374N66W PZ		1											1			2
374N68W 20-30cm			1		1									1		3
374N68W 20-30cm (FS)															1	1
374N70W 20-30cm (FS1)														1		1
374N70W 20-30cm (FS2)													1	1		2
374N70W 20-30cm (FS3)														1		1
374N72W PZ								1								1
376N64W PZ														1		1
376N66W 20-30cm						2					1				1	4
376N68W PZ								1						2	2	5

TABLE 10. (continued)

Provenience	Small Triangular	Lanceolate Expanded Stemmed	Lanceolate Shallow Side Notched	Medium-Sized Triangular	Ovate Long Rounded Stemmed	Short Straight Stemmed Wide Blade	Corner Notched Rounded Stemmed	Medium-Large Straight Stemmed	Medium-Sized Corner Removed	Medium-Sized Corner Notched	Larger Corner Notched	Large Side Notched	Unidentifiable Basal Fragments	Unidentifiable Medial Fragments	Unidentifiable Distal Tips	Total
376N68W 20-30cm			1					1							2	4
376N70W PZ								1							1	2
376N70W 20-30cm													1		1	2
378N66W 20-30cm (FS)													1	1		2
378N68W (N1/2) 20-30cm (FS)							1									1
378N68W (S1/2) 20-30cm (FS)													1			1
378N70W (SE) 20-30cm															1	1
Posthole 14						1										1
Posthole 144														1		1
Posthole 149															1	1
Posthole 150							1									1
Structure 2 370N72W Wall Trench Fill			1					1								2
Structure 2 372N74W Wall Trench Fill															1	1
Feature 1	2							3	2				2	4	2	15
Feature 2		2												1	2	5
Feature 4				1								1				2
TOTAL	3	7	4	5	1	8	4	10	3	3	1	1	9	30	24	113

*FS = flotation sample.

TABLE 11. Raw Material Distribution of Projectile Points/Knives.

	Small Triangular	Lanceolate Expanded Stemmed	Lanceolate Shallow Side Notched	Medium-Sized Triangular	Ovate Long Rounded Stemmed	Short Straight Stemmed Wide Blade	Corner Notched Rounded Stemmed	Medium-Large Straight Stemmed	Medium-Sized Corner Removed	Medium-Sized Corner Notched	Large Corner Notched	Large Side Notched	Unidentifiable Basal Fragments	Unidentifiable Medial Fragments	Unidentifiable Distal Tips	Total	Percent
A																	
B									1							1	1
C		1	1	2		2	3	6					3	12	4	34	30
D	1	1	1	1		1		2	1				1	2	2	13	12
E								1					1	1	1	4	4
F									1					1	1	3	3
G					1	1								4		6	5
H										1				2		3	3
I		1	1			1				1			1	1	2	8	7
J																	
K																	
L			1					1						4		6	5
M	1					1	1			1	1			3	3	11	10
N	1			2								1	2		3	9	8
O																	
P		2				1										3	3
Q		1														1	1
R															1	1	1
S															5	5	4
T		1				1							1		2	5	4
TOTAL	3	7	4	5	1	8	4	10	3	3	1	1	9	30	24	113	
PERCENT	2.7	6.2	3.5	4.4	0.9	7.1	3.5	8.8	2.7	2.7	0.9	0.9	8.0	26.5	21.2		

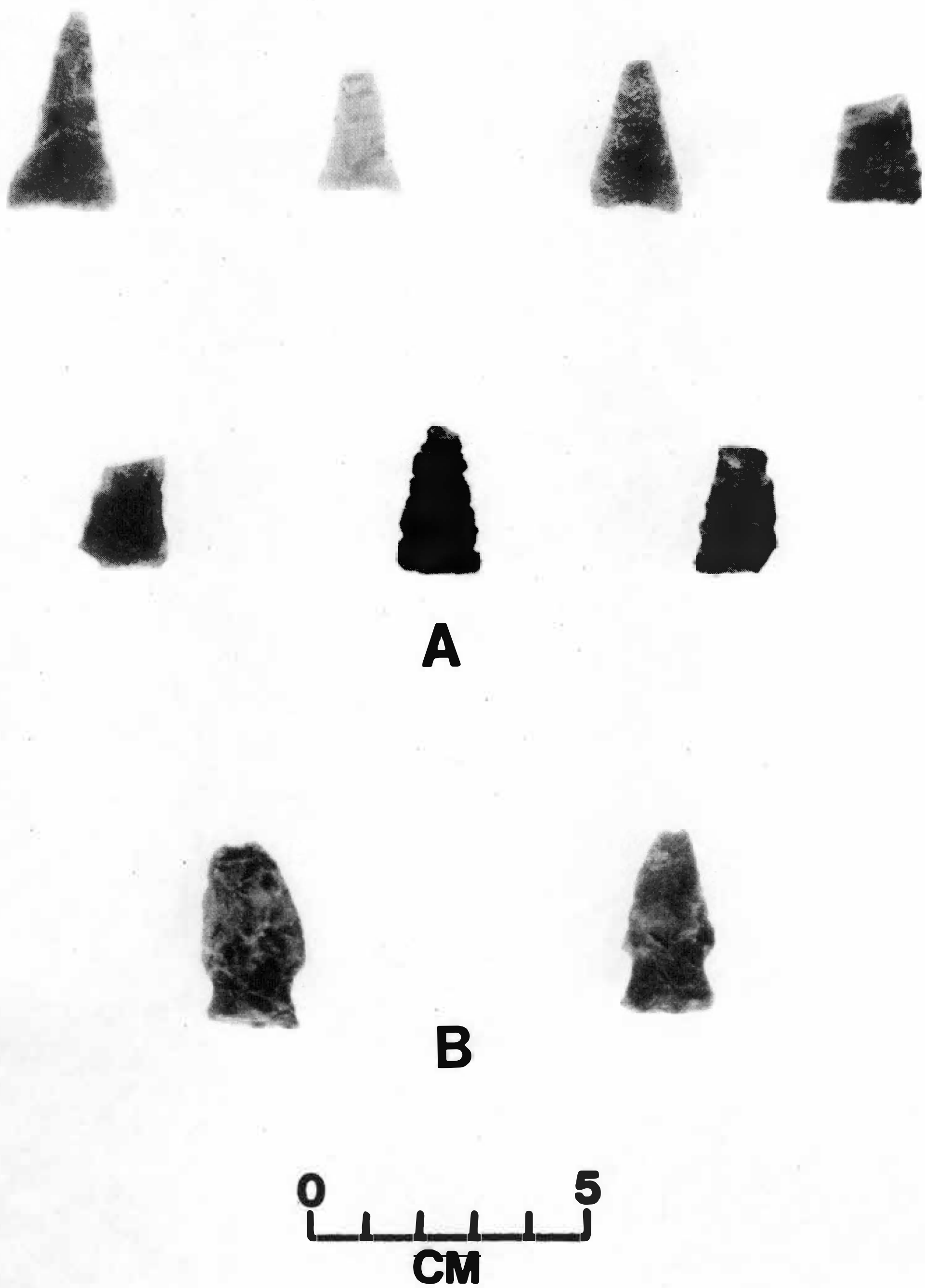

FIGURE 18. Projectile points/knives: A. small triangular; B. lanceolate expanded stemmed.

Although a total of eleven small triangular points have been recovered at the Ducks Nest site, only three, none of which was complete, were recovered during the 1977 excavations. The remaining eight, three of which are virtually complete (some leeway in the length dimension should be accepted since the tips of two of the specimens were slightly broken), were recovered during the 1976 season (Kline 1977: 31). These have been incorporated into the dimensions presented above but have not been included in Tables 10 and 11.

These specimens are similar to a number of named types in the Southeast, including Dallas (Lewis and Kneberg 1946: Figure 24) and Guntersville (Cambron and Hulse 1969: 50), but morphologically they most closely resemble the types Hamilton Triangular (Kneberg 1956: 24) and Madison (Scully 1951). Hamilton points are the characteristic type associated with the Late Woodland Hamilton culture and Early Mississippian manifestations in the Eastern Tennessee Valley (Lewis and Kneberg 1946: 110-111) and the Late Woodland Mason culture in the upper Elk Valley (Faulkner 1968: 83). Madison points, on the other hand, are associated with Mississippian manifestations in Alabama (Cambron and Hulse 1969: 53). In the upper Duck Valley similar small triangular points have been recovered in Late Woodland and Mississippian contexts dating from the late ninth century A.D. into the fourteenth century (Chapman 1978; Davis 1976: 89; Kleinhans 1978: 396-397).

Three of the Ducks Nest specimens exhibit incurvate blade edges and straight bases; two have straight blade and base edges; two have straight serrated blade edges and incurved bases; and one has straight serrated blade edges and a straight base. Six of the eleven are made of Blue-Green Nodular chert, indicating a preference for that material. Finally, of the three recovered during the 1977 season, two were recovered from Feature 1 and one was recovered in the plow zone of Unit 368N68W.

Lanceolate Expanded Stemmed (Figure 18B, page 104)

n	Relative Frequency
7	6.2%

	Length (n=3)	Width (n=3)	Thickness (n=3)
Range	48.0-34.0mm	17.3-25.0mm	7.2-9.4mm
Mean	38.7mm	20.7mm	8.1mm

These specimens resemble the type Bakers Creek associated with the Middle Woodland Copena complex in the Tennessee Valley of northern Alabama (DeJarnette, Kurjack and Cambron 1962; Walthall 1973). In the upper Elk and Duck Valleys of Middle Tennessee they are frequently encountered in late Middle Woodland Owl Hollow phase contexts and are considered to span the Middle and Late Woodland periods (Faulkner and McCollough 1973: 100; Cobb and Faulkner 1978). Five of the Ducks Nest specimens were recovered from unit level context, while the remaining two came from Feature 2.

Lanceolate Shallow Side Notched (Figure 19A)

n	Relative Frequency
4	3.5%

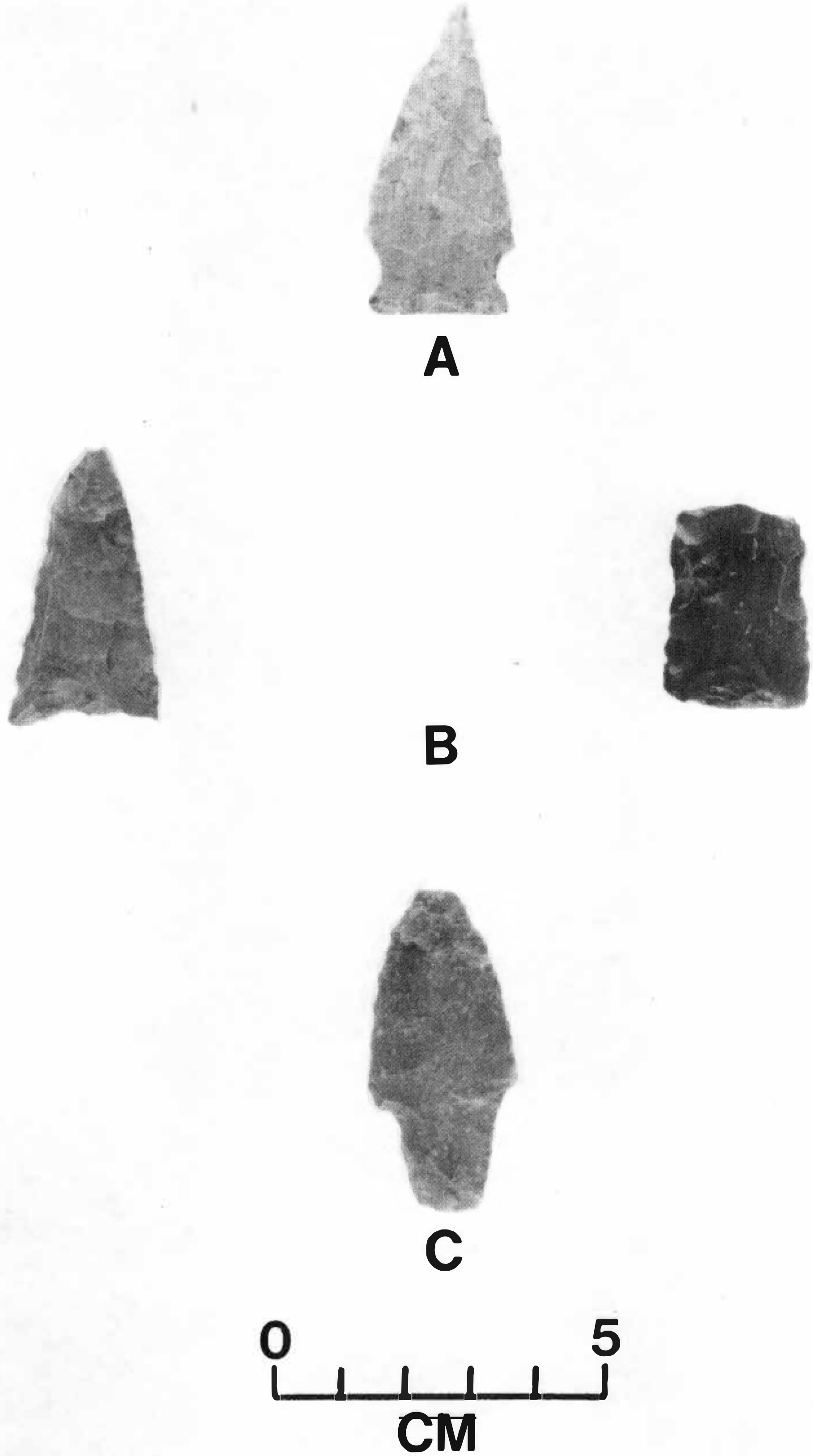

FIGURE 19. Projectile points/knives: A. lanceolate shallow side notched; B. medium-sized triangular; C. ovate long rounded stemmed.

	Length (n=2)*	Width (n=4)	Thickness (n=4)
Range	47.0-48.6mm	19.4-24.3mm	7.6-9.8mm
Mean	47.8mm	22.4mm	8.6mm

In Middle Tennessee, projectile points/knives of this form are frequent in late Middle Woodland Owl Hollow phase contexts dating from approximately A.D. 200-600 (Cobb and Faulkner 1978; Faulkner and McCollough 1973: 100). None of the Ducks Nest examples is made of the same raw material (Table 11, page 103). Three specimens were recovered from unit level context and one was recovered from the fill of Structure 2 wall trench in Unit 370N72W.

Medium-Sized Triangular (Figure 19B)

n	Relative Frequency
5	4.4%

	Length (n=4)	Width (n=5)	Thickness (n=5)
Range	34.0-47.1mm	19.1-23.3mm	6.1-8.7mm
Mean	39.9mm	21.3mm	7.7mm

Each of these conforms in morphology and comparative metric attributes to one or another of four types included in the recently defined McFarland Cluster for the upper Duck Valley (Faulkner and McCollough 1973: 146-148). Constituent types of this cluster, including McFarland Triangular (Bacon n.d.), Copena Triangular (Cambron 1958), and Village Copena (Bacon n.d.) are wide-spread in the Southeast, being primarily derived from Middle Woodland contexts. With regard to this cluster in the upper Duck Valley, Faulkner and McCollough (1973: 148) state, "It appears that the McFarland Cluster is associated with a cultural complex with Copena affinities, and could date from about the beginning of the Christian era to about 300-400 A.D." Tables 10 and 11 (pages 101 and 103, respectively), provide provenience and raw material information on the five medium-sized triangular points recovered at the Ducks Nest site.

Ovate Long Rounded Stemmed (Figure 19C, page 107)

n	Relative Frequency
1	0.9%

Length	Width	Thickness
49.7mm	23.1mm	8.2mm

This point is very similar to the Morhiss type described by Suhm and Krieger (1954: 454) and the Adena type described by Bell (1958: 4). In Middle Tennessee analogous specimens have been recovered from a Late Archaic-Early Woodland context at the Westmoreland-Barber site in the Nickajack Reservoir (Faulkner and Graham 1966: 70). On this basis the Ducks Nest specimen is suggested to be a Late Archaic-Early Woodland artifact. It was recovered from the midden zone in Unit 374N68W and is of raw material Type G.

Short Straight Stemmed, Wide Blade (Figure 20A)

n	Relative Frequency
8	7.1%

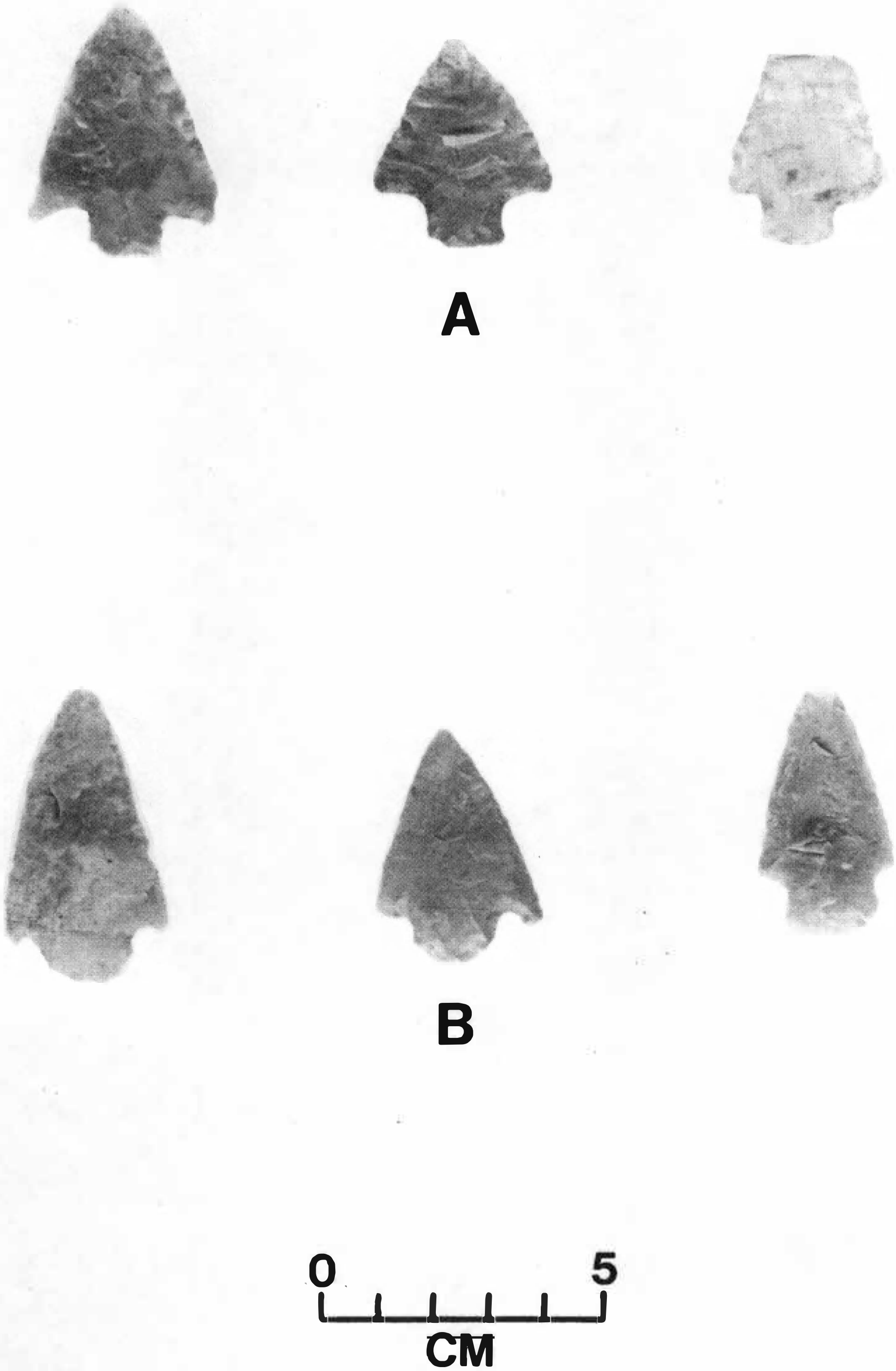

FIGURE 20. Projectile points/knives: A. short straight stemmed, wide blade; B. corner notched, rounded stemmed.

	Length (n=5)	Width (n=8)	Thickness (n=8)
Range	37.3-54.4mm	26.1-33.7mm	5.4-9.4mm
Mean	44.6mm	30.1mm	7.3mm

These projectile points/knives closely resemble the types Cotaco Creek (DeJarnette, Kurjack and Cambron 1962), Wade, and McIntire (Cambron and Hulse 1964). In the Tennessee Valley of northern Alabama and south central Tennessee these are considered to be Late Archaic-Early Woodland artifacts, examples of which were recovered from such a context at the Westmoreland-Barber site in the Nickajack Reservoir (Faulkner and Graham 1966: 72). Morphologically similar specimens have been included in the Wade type cluster in the upper Duck Valley and are considered to be Terminal Archaic-Early Woodland artifacts (Faulkner and McCollough 1973: 149). Seven of the Ducks Nest specimens were recovered from unit level context while the remaining one was recovered from a posthole in the wall trench of Structure 1.

Corner Notched, Rounded Stemmed (Figure 20B)

n	Relative Frequency
4	4.0%

	Length (n=4)	Width (n=4)	Thickness (n=4)
Range	41.6-51.5mm	25.4-32.0mm	7.3-9.2mm
Mean	47.0mm	29.0mm	8.2mm

It is probable that these represent a variant of the immediately preceding type. As indicated by the metric attributes they are very similar in size; however, in contrast the four artifacts in this type exhibit shoulder barbs and rounded bases. Their manufacture during the Terminal Archaic-Early Woodland periods is suggested.

Medium-Large Straight Stemmed (Figure 21A)

n	Relative Frequency
10	8.8%

	Length (n=2)	Width (n=9)	Thickness (n=10)
Range	73.4-54.2mm	25.1-36.0mm	7.1-12.5mm
Mean	X	29.7mm	9.2mm

These projectile points/knives resemble the ubiquitous Late Archaic stemmed types Pickwick (DeJarnette, Jurjack and Cambron 1962) and Ledbetter (Kneberg 1956) which are distributed throughout the Tennessee River drainage. As shown in Table 11, page 103, most are made of raw material Type C. Although six were recovered from unit level context and one was recovered Structure 2 wall trench fill, three were recovered from Feature 1.

Medium-Sized Corner Removed (Figure 21B)

n	Relative Frequency
3	2.7%

	Length	Width (n=3)	Thickness (n=3)
Range	X	27.8-30.0mm	8.7-9.4mm
Mean	X	29.2mm	9.0mm

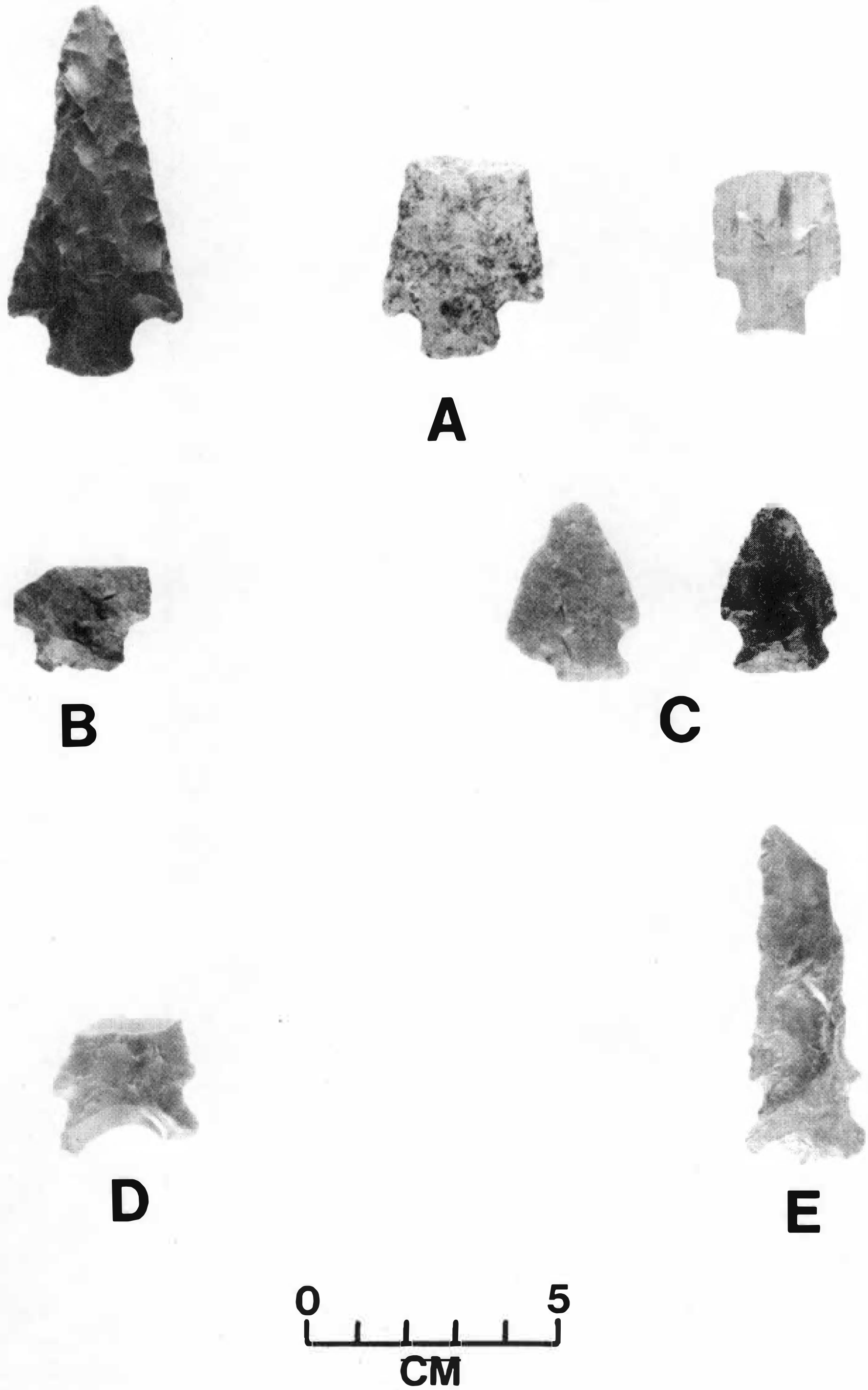

FIGURE 21. Projectile points/knives: A. medium-large straight stemmed; B. medium-sized corner removed; C. medium-sized corner notched; D. large corner notched; E. large side notched.

These projectile points/knives correspond to Types 113 and 114 in the Normandy Typology (Faulkner and McCollough 1973: 128-129) and to previously named types such as Sykes (Lewis and Lewis 1961: 40-43), White Springs (DeJarnette, Kurjack and Cambron 1962), and Damron (Cambron and Hulse 1964: A83). Of these, they most closely resemble the White Springs type which was found at the Stanfield-Worley Bluff Shelter in Middle Archaic contexts. A similar association is suggested for the Ducks Nest examples, two of which were recovered from Feature 1.

Medium-Sized Corner Notched (Figure 21C)

n	Relative Frequency
3	2.7%

(two complete specimens)

Length	Width	Thickness
36.3mm	27.2mm	8.2mm
34.2mm	23.6mm	8.2mm

The cultural affiliation/temporal position of these artifacts is uncertain (cf. Faulkner and McCollough 1973: 134). Morphologically they closely resemble Early Archaic forms such as Kirk Corner Notched (Coe 1959) and types which have been found associated in Early Archaic contexts (Chapman 1973; 1975). Two of these exhibit light grinding of the basal margin. Tables 10 and 11 (pages 101 and 103, respectively), show that no two were recovered from the same provenience or are made of the same raw material.

Large Corner Notched (Figure 21D, page 113)

n	Relative Frequency
1	0.9%

Length	Width	Thickness
X	29.7mm	8.9mm

Although broken across the distal extremity and lacking a portion of the central basal margin, this specimen corresponds to the type Kirk Corner Notched (Coe 1959) which is an Early Archaic form dating from approximately 7500-6900 B.C. in the Little Tennessee Valley (Chapman 1976). It is made of raw material Type M and was recovered from the midden zone in Unit 376N66W.

Large Side Notched (Figure 21E, page 113)

n	Relative Frequency
1	0.9%

This projectile point/knife measures 26.2mm wide and 11.5mm thick, but is broken at the distal end. The basal margin is lightly ground and there are numerous incipient thermal fractures ("pot lid" fractures) over the surface. It resembles the type Big Sandy (Cambron and Hulse 1964: 13) and consequently is suggested to be an Early Archaic artifact. Similar examples were recovered from an early context at the Stanfield-Worley Bluff Shelter (DeJarnette, Kurjack and Cambron 1962). The Ducks Nest specimen was recovered from Feature 4, and is made of raw material Type N.

Unidentifiable Basal Fragments

n	Relative Frequency
9	8.0%

Although mechanical stress and thermal alteration are both represented in this category, the former was the most frequent cause of breakage. Mechanical failure was induced not only during manufacture but also during use.

Unidentifiable Medial Fragments

n	Relative Frequency
30	26.5%

As above, both mechanical and thermal stress are represented in this category. Eighteen specimens exhibit snap fractures of their proximal and distal ends.

Unidentifiable Distal Tips

n	Relative Frequency
24	21.2%

The relative frequency between mechanically and thermally induced breakage in this category is consistent with the preceding two categories--mechanical stress accounting for 62.5 percent (n=15).

Chipped Stone Tool Summary

A variety of unifacial and bifacial implements were made and used at the Ducks Nest site. However, bifacial tools are more frequent than are unifacial ones. The relative frequencies of bifacial versus unifacial artifacts, 55 percent versus 45 percent, might be considered to be misleading since the vast majority of artifacts included within the uniface series is derived from the category Utilized Flake. If both categories of utilized flakes are excluded the number of unifacial artifacts decreases from 143 to 23, while the number of bifacial artifacts decreases from 172 to 156. Respectively, these adjusted quantities represent 13 percent and 87 percent of the total chipped stone tool sub-assemblage. It has been argued on the basis of flake type derivation, however, that the category Utilized Flake does not represent a random assortment of accidently damaged flakes, but instead a valid category of probable short term use tool. Consequently, the uniface series should be considered to consist of 143 artifacts representing a minimum of seven types/classes. For the series as a whole the flake type distribution is: 30 decortication flakes, 58 interior flakes, 23 bifacial thinning flakes, and 32 unidentifiable flake fragments. As indicated by a chi-square value of 114.237 (at df = 3) this distribution is far from random (significant at greater than the .001 level), demonstrating the selection of interior flakes for unifacial tools. The raw material distribution within the uniface series is consistent with the remainder of the chipped stone sub-assemblage--Types C, D, E, N and M being the most frequent.

Although a variety of artifacts are represented, the biface series is predominantly composed of projectile points/knives. These account for 67.2 percent of all bifacial artifacts. However, the number of typologically non-Mississippian points is striking. In fact, of all the identifiable specimens recovered (n = 58), small triangular forms account for only 19 percent. This pattern is not unique to the Ducks Nest site, but is evident at a number of other Mississippian sites in Tennessee: the Averbuch site north of Nashville (Walter E. Klippel, personal communication, 1978), the Mound Bottom site on the Harpeth River (O'Brien 1977), and sites 40CF111 and 40CF32 in the upper Duck Valley (Klienhans 1978; Chapman 1978). Although component mixing may be partially responsible, non-Mississippian projectile points/knives are frequently encountered in secure Mississippian contexts. At the Ducks Nest site for example, Feature 1 yielded a total of 15 complete and fragmentary projectile points/knives, only two of which are small triangular forms. Chapman (1978) has suggested that land clearing associated with agricultural practices may provide an explanation for this pattern. If (1) earlier projectile points/knives were encountered during cultivation of agricultural plots and (2) if these were viewed as being potentially useful, then their presence in Mississippian assemblages is understandable. Such a pattern would represent a prehistoric example of what Schiffer (1975: 34) refers to as an A-S formation process--the cycling of an artifact from archaeological contest into a new cultural or systemic context. If it could be demonstrated that non-Mississippian points recovered from Mississippian contexts exhibit different wear patterns than those from other archaeological contexts (i.e., primary contexts), then support for this hypothesis would be strengthened.

I. Ground Stone Artifacts

Eleven ground stone artifacts, referable to seven distinct types, were recovered (Table 12). These constitute 0.2 percent of the total lithic sub-assemblages and 3 percent of the lithic implements. With only three exceptions these are made of fine to medium-grained sandstone.

Pitted Sandstone Cobble: n = 3

Though such specimens have typically been referred to as "nuttingstones," their actual function is problematic. Conceivably they could have served in any pounding or grinding activity--e.g., shelling nuts and pulverizing the meats, grinding seeds, cracking bone for the extraction of marrow, or driving stakes into the ground. None of these artifacts were recovered from the same provenience and only one is complete. The complete specimen measures 93.5mm long, 45.5mm wide and 44.3mm thick. Of the remaining two specimens, one is an oblong cobble which split transversely through the middle, bisecting a shallow pecked drpression on one of its flat sides. The other is a dome-shaped fragment of a cobble which split along a natural bedding plane, a shallow pecked depression being present at the apex of the dome.

Ground and Faceted Sandstone Cobble: n = 1

This artifact measures 115.2mm long, 82.0mm wide and 51.0mm thick. One of its two largest flat surfaces has been ground smooth and the rounded prominences at the opposite ends of its long axis show evidence of battering. Artifacts of this form are typically referred

TABLE 12. Ground Stone Artifacts.

Provenience	Pitted Sandstone Cobble	Ground and Faceted Sandstone Cobble	Grooved Sandstone Abrader	Faceted Sandstone Abrader	Sandstone Discoidal	Igneous Axe Fragment	Soapstone Sherd	Total
366N68W PZ				1				1
368N70W (SE1/4) 20-30cm	1							1
368N74W PZ	1					1		2
370N70W 20-30cm		1						1
372N64W PZ						1		1
372N66W PZ							1	1
372N74W PZ					1			1
374N72W PZ				1				1
376N70W (SE1/4) 20-30cm	1							1
PH 144			1					1
TOTAL	3	1	1	2	1	2	1	11

to as "millingstones" or manos, carrying the implication that they were used primarily in plant food processing.

Grooved Sandstone Abrader: n = 1 (Figure 22A)

This artifact was recovered from the ramp associated with the southernmost interior support post in Structure 1. It consists of a flat slab of sandstone, measuring 63.0mm long, 46.1mm wide and 17.5mm thick, with a single deep U-shaped groove approximately 5mm deep and 6.5mm wide longitudinally across one surface. It was probably used to sharpen pointed tools of bone, antler, or possibly wood. The U-shaped groove morphology on this specimen, however, indicates the tip abrasion of bluntly pointed objects, not sharply pointed ones.

Faceted Sandstone Abraders: n = 2

Both of these consist of small irregularly-shaped slabs of sandstone exhibiting one flatly ground and smoothed surface.

Sandstone Discoidal: n = 1 (Figure 22B)

This artifact was recovered from the plow zone in Unit 372N74W. It consists of a sandstone disc 46.2mm in diameter and 26.0mm thick, with a shallow pecked depression on one of its flat surfaces. Discoidals are thought to have been gaming stones.

Igneous Axe Fragments: n = 2

Both of these are very fragmentary. One is a bit fragment and the other is a butt fragment exhibiting a partial groove. Grooved axes are not generally characteristic of Mississippian assemblages, consequently, these may not be associated with that component at the Ducks Nest site.

FIGURE 22. Ground stone implements: A. grooved sandstone abrader; B. sandstone discoidal.

Soapstone Sherd: n = 1

One small sherd from a soapstone vessel was recovered in the plow zone of Unit 372N66W. It is smooth on both interior and exterior surfaces and shows no signs of having been reworked. It is probable that this artifact derives from an earlier occupation of the Ducks Nest site.

Lithic Sub-Assemblage Summary

Unfortunately it was not possible to separate the Structure 1 and Structure 2 occupation assemblages. Consequently, the only recourse has been to treat the entire collection en bloc. It can be argued, however, that doing so is not greatly out of line. The superposition and identical orientations of both structures, the radiocarbon dates (see Chapter VIII), and the shallowness and lack of stratification of the midden zone all indicate that only a short time elapsed between the building of Structures 1 and 2. It is also probable that the entire Mississippian occupation was not of long duration. The data suggest that Structure 2 represents a rebuilding episode associated with Structure 1 and that the same type of settlement is represented in each case. If so, the associated artifactual assemblages would not have been very different. Greater heterogeneity than is expressed in the observed assemblage configuration would in fact be expected had there been a marked difference in the activities performed during the occupations of Structures 1 and 2.

As previously discussed, there is a diverse pattern of lithic raw material utilization expressed at the Ducks Nest site. Cherts derived from all three major geologic formations exposed in the Eastern

Highland Rim were exploited. Although Fort Payne cherts are the most frequent, cherts derived from Warsaw and St. Louis formation deposits also occur in significant quantities. All of the raw materials present are considered to be of local origin. This interpretation is supported by the presence and relative frequency of decortication debitage. In addition it has been suggested that raw materials were gathered in the river valleys where erosion has exposed a variety of geologic formations and where chert would have been available from both primary and derived contexts.

Technologically the Ducks Nest lithic sub-assemblage (Table 13) is not complex. Two principal manufacturing techniques were practices: (1) pecking and grinding, and (2) knapping. Pecked and ground stone artifacts, however, are not abundant, and with the exception of the sandstone discoidal, most achieved their form through abrasion acrued during use instead of through the application of pecking and grinding as a manufacturing technique.

Chipped stone tools and the by-products of their manufacture represent the single largest class of remains recovered. Among the various classes of debitage identified, flakes produced by direct hard hammer and direct soft hammer percussion predominate. Direct hard hammer percussion was employed during the initial stages of reduction and subsequently to produce flakes suitable for modification and use. The thinning and shaping of bifacial implements also was accomplished by direct percussion, but soft hammer fabricators were employed. Two other knapping techniques, bipolar percussion and pressure flaking, were identified but neither is well represented. Very few artifacts exhibit

TABLE 13. Lithic Sub-Assemblage Summary Data.

	PROVENIENCE			
	Features	Postholes	Unit Levels	Cumulative Frequency
Hammerstone	0.1		*	*
Multi-Directional Core	0.7	0.8	1.0	0.9
Flat Core			0.2	0.1
Discoidal Core		0.2	0.1	0.1
Subconical Core			*	*
Primary Decortification Flake	3.6	2.3	2.4	2.8
Secondary Decortification Flake	6.4	4.8	5.7	5.9
Interior Flake	13.0	11.9	14.2	13.6
Bifacial Thinning Flake	29.9	32.3	26.9	28.3
Blade/Blade-Like Flake	0.2		0.1	0.1
Bipolar Debitage	0.1	0.6	0.1	0.1
Unidentifiable Flake Fragments	42.5	44.8	41.9	42.4
Side Scraper	0.1		0.2	0.2
End Scraper			0.1	0.1
Spokeshave			0.1	0.1
Denticulate			0.1	0.1
Perforator			*	*
Combination Tools		0.4	*	0.1
Utilized Flake--Unifacial	1.6	0.4	2.6	2.1
Utilized Flake--Bifacial	0.3		0.3	0.3
Thick Biface/Knife	0.1	0.2	0.3	0.2

TABLE 13. (continued)

	PROVENIENCE			
	Features	Postholes	Unit Levels	Cumulative Frequency
Thin Biface/Knife	0.1	0.2	0.3	0.3
Chopping Tool			0.1	0.1
Core Tool/Scraper			0.2	0.1
Drill			*	*
Digging Tool/Hoe	0.1			*
Adze		0.2	*	*
Miscellaneous Bifacial Implements			0.1	*
Projectile Points/ Knives	1.4	0.8	2.4	2.0
Ground Stone Implements		0.2	0.3	0.2

evidence of pressure retouch. The most notable exception to this being the small triangular points.

In overall qualitative and quantitative characteristics the Ducks Nest site stone tool sub-assemblage is composed of 54 percent bifacial implements, 43 percent unifacial implements, and 3 percent ground stone implements. The relative proportion of bifacial implements indicates that on-site activities necessitated the manufacture of a variety of tools suitable for cutting and slicing. More specifically it is inferred on the basis of the high frequency of projectile points/knives and thin and thick biface/knives that hunting was an important activity, and that animals were returned to the site for butchering. Other subsistence activities were undoubtedly performed, but ground stone tools and other implements that are traditionally associated with plant food processing are rare at the Ducks Nest site.

CHAPTER VI

CERAMICS

A. Introduction

In contrast to lithics, ceramics are conspicuous by their rarity at the Ducks Nest site. One loop handle (two, including a small fragment still attached to a body sherd), eight clay beads, a miniature vessel fragment, and 531 sherds, including eight rims, were recovered. On the basis of temper and surface treatment the sherd sample is divisible into 20 categories, representing three major ceramic wares. An interesting aspect of this collection is that shell tempered sherds account for only 4.9 percent of the total, while limestone tempered, chert tempered, and mixed tempered sherds account for 67.2 percent, 13.9 percent, and 13.4 percent, respectively. One clay tempered sherd and two sand tempered sherds account for the remaining 0.6 percent of the collection (Table 14). Provenience information is provided in Table 15.

Ceramic preservation was poor. Not only were most sherds small, but all particles of temper had been leached out in the limestone tempered and shell tempered samples. Limestone and shell, however, fracture into distinctively shaped particles that can be identified even in highly leached ceramic collections. Leached shell temper is typically indicated by the presence of flat platy or lenticular voids

TABLE 14. Ceramic Type Distribution.

	Body Sherds	Rim Sherds	Total	Percent By Temper	Percent By Sample
Shell Tempered					
a. Plain	17	-	17	65.4	3.2
b. Residual	9	-	9	34.6	1.7
Shell/Clay Tempered					
a. Plain	-	1	1	50.0	0.2
b. Fabric Impressed	1	1	1	50.0	0.2
Clay Tempered					
a. Plain	1	1	1	100.0	0.2
Limestone Tempered					
a. Plain	175	4	179	50.1	33.7
b. Cordmarked	17	-	17	4.8	3.2
c. Indeterminate Stamped	2	-	2	0.6	0.4
d. Residual	159	-	159	44.5	29.9
Limestone/Shell Tempered					
a. Plain	35	3	38	61.3	7.1
b. Residual	24	-	24	38.7	4.5
Limestone/Clay Tempered					
a. Plain	4	-	4	100	0.7
Limestone/Chert Tempered					
a. Plain	3	-	3	100	0.6
Chert Tempered					
a. Plain	20	-	20	27.0	3.8
b. Cordmarked	23	-	23	31.1	4.3
c. Fabric Impressed	3	-	3	4.1	0.6
d. Knot Roughened	4	-	4	5.4	0.7
e. Indeterminate Stamped	1	-	1	1.4	0.2
f. Residual	23	-	23	31.1	4.3
Sand Tempered					
a. Residual	2	-	2	100	0.4
			531		

TABLE 15. Provenience Distribution of Ceramics.

Provenience	Shell tempered Plain	Shell tempered Residual	Shell/Clay tempered Plain	Shell/Clay tempered Fabric Impressed	Clay tempered Plain	Limestone tempered Plain	Limestone tempered Cordmarked	Limestone tempered Stamped	Limestone tempered Residual	Limestone/Shell Plain	Limestone/Shell Residual	Limestone/Clay Plain	Limestone/Chert Plain	Chert tempered Plain	Chert tempered Cordmarked	Chert tempered Fabric Impressed	Chert tempered Knot Roughened	Chert tempered Stamped	Chert tempered Residual	Sand tempered Residual	Total
General Surface	2					2	1							1	2	1			1		10
368N66W Plow Zone						1															1
368N70W Plow Zone														1	1						2
368N70W, SE1/4 20-30cm, FS*										1			1								2
368N70W, NE1/4 20-30cm, FS												1									1
370N68W 20-30cm						1															1
370N68W, SE1/4 20-30cm, FS											1										1
370N70W Plow Zone										3					1						4
370N70W 20-30cm				1											1						2
370N72W Plow Zone																	1				1
370N72W, NE1/4 20-30cm, FS						1	1		1					1	1	1			5		11
372N66W Plow Zone												1									1
372N70W Plow Zone								1													1
372N70W 20-30cm							2		2	1	1			2	3		1		1		13
372N70W 20-30cm, FS1						2			1	3											6
372N70W 20-30cm, FS2						3			6	2	2			1	3				2		19
372N70W 20-30cm, FS3									1											2	3
372N72W 20-30cm, FS		3				3			14		3			3					2		28
372N74W 20-30cm						4															4
374N68W 20-30cm						2				1											3
374N68W 20-25cm, FS									1	1											2
374N70W 20-30cm	2					7			9	4				1					1		24
374N70W, NW1/4 20-30cm, FS1						1			1	1											3
374N70W, NW1/4 20-30cm, FS2						3		1	8	2	4			1							19
374N70W, NW1/4 20-30cm, FS3						2			2						1						5
374N72W Plow Zone										1											1
376N66W Plow Zone					1	1				2	1										5
376N66W 20-30cm						1				1											2
376N68W Plow Zone														1					1		2
376N70W 20-30 cm										1											1
378N66W 20-30cm, FS	1 limestone tempered loop handle					1			2					1							4

TABLE 15. (continued)

Provenience	Shell tempered Plain	Shell tempered Residual	Shell/Clay tempered Plain	Shell/Clay tempered Fabric Impressed	Clay tempered Plain	Limestone tempered Plain	Limestone tempered Cordmarked	Limestone tempered Stamped	Limestone tempered Residual	Limestone/Shell Plain	Limestone/Shell Residual	Limestone/Clay Plain	Limestone/Chert Plain	Chert tempered Plain	Chert tempered Cordmarked	Chert tempered Fabric Impressed	Chert tempered Knot Roughened	Chert tempered Stamped	Chert tempered Residual	Sand tempered Residual	Total
378N68W 20-30cm, FS inside Structure 1		4				2			2		2			2					1		13
378N68W 20-30cm, FS outside Structure 1	1					1			4		2	1		1							10
378N70W 20-30cm										2											2
378N70W SE1/4 20-30cm, FS		2				2			3					1	1						9
Posthole 43										1											1
Posthole 49												1									1
Posthole 65							1														1
Posthole 84										1											1
Posthole 96	1																		1		2
Posthole 99									1										1		2
Posthole 101											2					1					3
Posthole 127									6										1		7
Posthole 144						1															1
Posthole 149									2	2											4
368N72W Wall Trench Fill Structure 2	2																				2
372N72W Wall Trench Fill Structure 2										1				1							2
374N66W Wall Trench Fill Structure 2						2			1												3
376N66W Wall Trench Fill Structure 2																		1			1
376N68W Wall Trench Fill Structure 2			1			1															2
Feature 1						4	1			1				1	2		1				10
Feature 2									5		5								1		11
Feature 3														1	7				5		13
Feature 4	(2 clay beads)					2			28		1										31
Feature 5						87	10		59	6			2								164
Feature 76-3	9					42	1		(6 clay beads and an untempered "pinch pot" fragment)									1			53
TOTAL	17	9	1	1	1	179	17	2	159	38	24	4	3	20	23	3	4	1	23	2	531
PERCENT	3.2	1.7	0.2	0.2	0.2	33.7	3.2	0.4	29.9	7.1	4.5	0.7	0.6	3.8	4.3	0.6	0.7	0.2	4.3	0.4	

*FS = flotation sample.

in the clay matrix, while the clay matrix of leached limestone tempered sherds is typically honey combed with round to blocky cavities. In contrast to the shell tempered and limestone tempered samples, sherds tempered with chert, clay, and sand were better preserved. They were not, however, represented by larger sherds. Most sherds were smaller than 40mm in maximum dimension, and eroded. For this reason 40 percent were classified as residual because it was impossible to determine the nature of exterior surface finish. No reconstructable vessels or portions of vessels were recovered. Most of the sherds recovered from Feature 5 appear to be from a single vessel but attempts to reconstruct this have been futile. In addition, the eight rim sherds recovered are too small to provide accurate estimates of vessel morphology and size.

In the descriptions below type names have not been used to designate specific temper and surface treatment categories. A number of these in fact have no formal type name. Where these characteristics conform to a described ceramic type this information is included. Such names, however, should be considered as primarily descriptive and only secondarily as temporal and cultural indicators. Ceramic types do not necessarily imply specific genetic relationships but can be useful for broad scale inter-site comparative purposes.

Rim sherds and vessel appendages have not been treated separately, but are described below within their respective surface treatment and/or temper category. It should be noted with respect to mixed temper categories that the order in which constituent tempering agents is listed reflects a subjective assessment of their relative abundance. This engenders a terminological and analytical problem. It is not known, for example, whether the mixed temper category described below as Limestone/Shell is equivalent to the Shell/Limestone tempered ceramics identified at other Mississippian sites in Tennessee (cf. Salo 1969: 122; Kleinhans 1978: 444; Chapman 1978).

B. Shell Tempered Ware

Shell Tempered Plain: Sample--17 Body Sherds

The shell tempered sherds on which surface treatment is discernible (65.4 percent) exhibit plain, smoothed interior and exterior surfaces. The paste is laminated and friable, and there is a wide range of color variation exhibited--from carbon infused and encrusted black to reddish-orange. Although no intact rim sherds were recovered, one sherd exhibits a gentle outward curvature suggesting a flaring rimmed jar. These sherds conform to the type Mississippi Plain (Phillips 1970: 130-135) which is common on early through late Mississippian sites in Tennessee. Nine were recovered from Feature 76-3, two from fill in the wall trench of Structure 2, and the remaining six were from unit level context.

Shell Tempered Residual: Sample--9 Body Sherds

Nine sherds of shell tempered pottery (34.6 percent), all recovered from unit level context, were too eroded to determine surface treatment. In color, thickness, and past characteristics they are indistinguishable from the sample of shell tempered plain sherds.

C. Shell/Clay Tempered Ware

Shell/Clay Tempered Plain: Sample--1 Rim Sherd (Figure 23A)

This sherd was recovered from the wall trench fill of Structure 2 in Unit 376N68W. It exhibits a gentle outward curvature and a plain rounded lip, indicating a flaring rimmed jar. Converging oblique fractures have left only a small segment of the rim intact, making it impossible to measure the orifice diameter. The paste is medium-gray in color and compact. The temper is finely crushed shell with a small quantity of light gray clay particles. Both the interior and exterior surfaces are smoothed and the maximum thickness of the sherd is 6.5mm. In contrast to the medium-gray interior surface, the exterior surface is bright orange from the application of a wash or slip. Although clay tempered ceramics are known from other Mississippian contexts in Tennessee (cf. Baldwin 1966), this sherd does not conform to any previously named type.

Shell/Clay Tempered Fabric Impressed: Sample--1 Body Sherd

The identification of this sherd as fabric impressed is tentative. It is small and exhibits a roughened surface more resembling the Early Woodland type Long Branch Fabric Marked than the Mississippian salt pan fabric marked types. The core is black and the surfaces are gray-brown. The temper consists of a small amount of light gray clay and finely crushed shell.

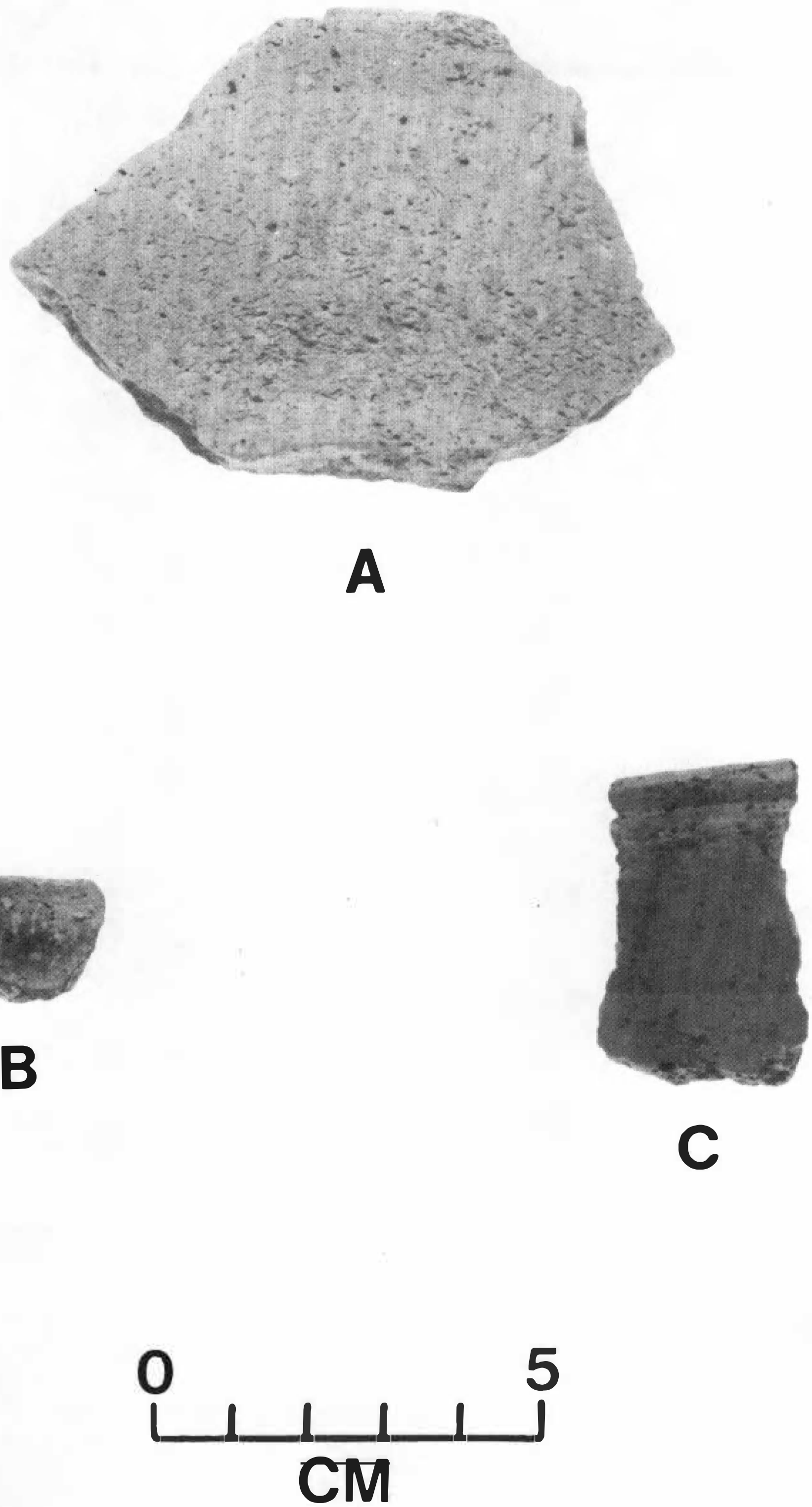

FIGURE 23. Ceramics: A. shell/clay tempered rim; B. limestone tempered rim, rounded lip; C. limestone tempered rim, rolled rim, flattened lip.

D. Clay Tempered Ware

Clay Tempered Plain: Sample--1 Body Sherd

This sherd was recovered from the plow zone in Unit 376N66W. The paste is light-gray and the particles of clay temper are almost indistinguishable from it. Although somewhat eroded, both interior and exterior surfaces are smooth.

E. Limestone Tempered Ware

Limestone Tempered Plain: Sample--175 Body, 4 Rim Sherds

Crushed limestone tempered ceramics predominate at the Ducks Nest site, with plain surfaced sherds accounting for a large portion of the sample (50.1 percent). Although generally referred to as Mulberry Creek Plain (Haag 1939: 9; Heimlich 1952: 15-17), this type has become a catch-all category incorporating virtually all limestone tempered plain ceramics. Since these are known to occur throughout the Middle Woodland period and on into the Mississippian (Kleinhans 1978: 426) it would be best to employ no formal type name (cf. Salo 1969: 111, 125-218). There is a wide range of variation in thickness, color, and abundance of temper in the Ducks Nest sample. However, temper is abundant in most sherds and both interior and exterior surfaces are smoothed. Four rim sherds were recovered. Two are straight rounded lips. The other specimens are excurvate, but one has a rounded lip and the other has a rolled rim with flattened lip (Figure 23B and C, respectively). None is large enough for measurement of orifice diameter or accurate assessment of vessel morphology. One body sherd, recovered from the wall trench fill of Structure 2 in Unit 376N68W, has a fragmentary loop handle (Figure 24A). It has a slightly flattened cross section, measuring 13.2mm x 11.2mm in diameter, and was welded to the vessel body. An additional limestone tempered loop handle was recovered from the midden zone in Unit 378N66W. The association of limestone tempered plain vessels and loop handles has been noted by Heimlich (1952: 16) in the Guntersville Basin of northern Alabama, by Salo (1969: 111, 125-218) at the Martin Farm site in the Little Tennessee Valley of Eastern Tennessee, by Kleinhans (1978: 426) at the Banks V site in the upper Duck Valley of Middle Tennessee, and by Chapman (1978) at the Eoff I site also in the upper Duck Valley.

Limestone Tempered Cord Marked: Sample--17 Body Sherds

Ten of these sherds were recovered from Feature 5. The cord impressions on these sherds are generally shallow and widely spaced. In addition, many have been smoothed over. The paste is medium-gray and has a moderate to large quantity of temper. In Middle Tennessee most limestone tempered cord marked ceramics are referred to as Candy Creek Cord Marked (Lewis and Kneberg 1946: 102-103). Faulkner (1968a: 26), however, has noted that this type has been used to identify ceramics which exhibit a wide range of variation in the depth and spacing of cord impressions. He suggests that the shallow, widely spaced and scraped varieties are more similar to Hamilton Cord Marked (Lewis and Kneberg 1946: 83, 102-103), an East Tennessee Late Woodland type.

Limestone Tempered Indeterminate Stamped: Sample--2 Body Sherds

Both sherds were recovered from unit level context--one from the plow zone in Unit 372N70W and one from the midden zone in Unit 374N70W.

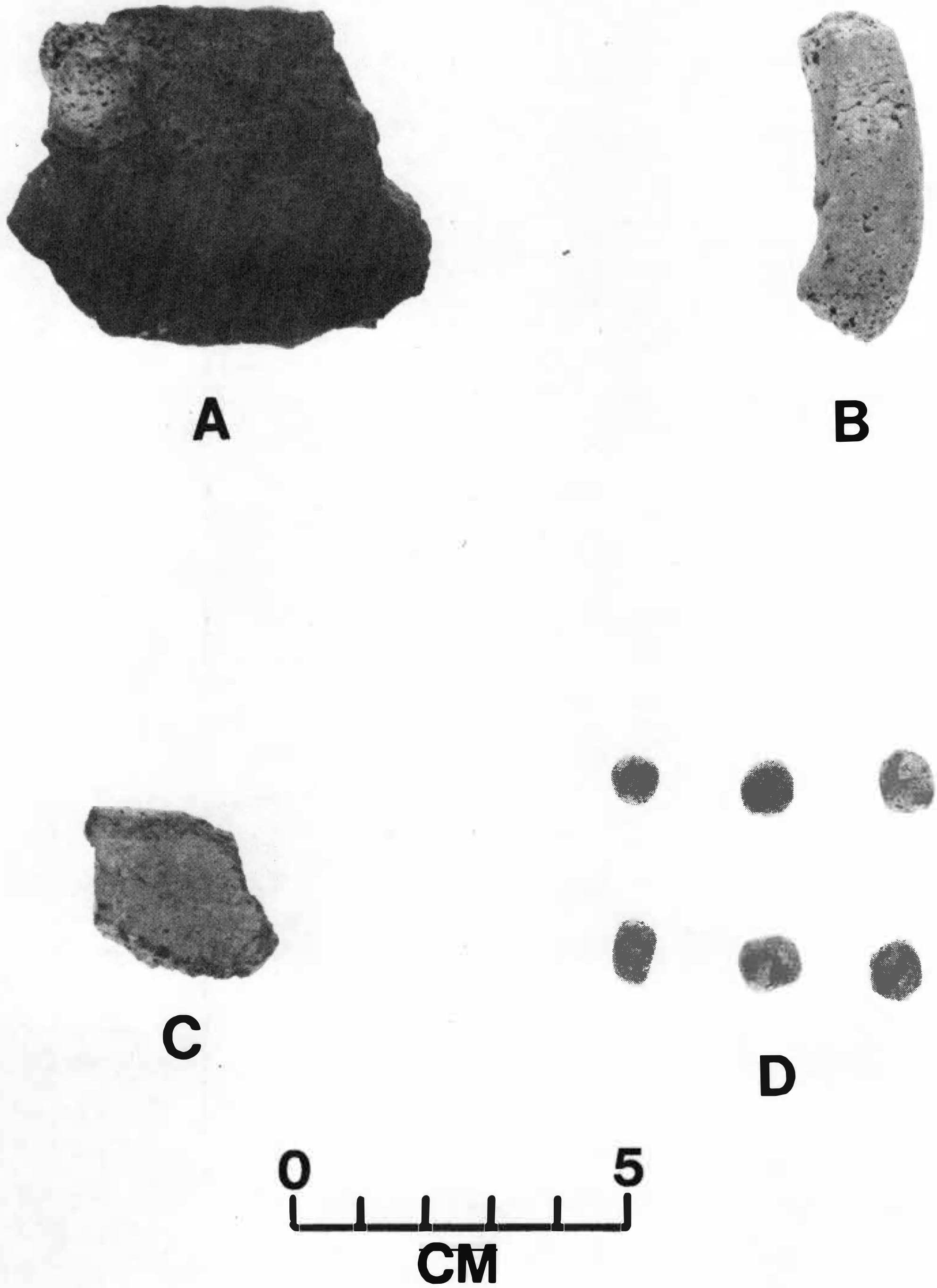

FIGURE 24. Ceramics: A. limestone tempered body sherd with loop handle attachment; B. limestone tempered loop handle; C. limestone/shell tempered rim, flattened lip; D. clay beads.

Neither is large enough to identify the exterior stamp design. The paste of both is compact, dark gray and contains only small to moderate amounts of temper. In addition they are both thin, 3-4mm thick. Several types of limestone tempered stamped pottery are known from the Eastern Highland Rim, but on the basis of these two sherds no accurate identification can be made.

Limestone Tempered Residual: Sample--159 Body Sherds

Highly eroded limestone tempered sherds not only account for a large portion of the limestone tempered ware but also for a large portion of the entire ceramic collection from the Ducks Nest site. In view of the large quantity of limestone tempered plain sherds, the majority of residual sherds probably derive from that type.

Limestone Tempered Loop Handle: Sample--1 (Figure 24B)

This fragmentary handle was recovered from the midden zone in Unit 378N66W. It measures 48.5mm long and is slightly curved but broken at both ends leaving no evidence of the manner of vessel attachment. In cross section it is roughly circular but is slightly flattened, measuring 18.2mm x 15.0mm in diameter.

F. Limestone/Shell Tempered Ware

Limestone/Shell Tempered Plain: Sample--35 Body, 3 Rim Sherds

These sherds were primarily recovered from unit level context. Aside from the mixture of tempering agents, these sherds resemble both the limestone tempered plain and shell tempered plain samples. They are generally thin, gray to reddish-orange, have smoothed interior and exterior surfaces, and contain moderate amounts of temper. Of the three rim sherds, two have rounded lips but are too small for a determination of rim profile. The third specimen is slightly excurvate and has a plain flattened lip (Figure 24C). Mixed limestone/shell tempered ceramics were first identified at the Martin Farm site in an early Mississippian context dating to approximately A.D. 1000 (Salo 1969: 122; Schroedl 1978: 193). Subsequently, similar ceramics have been identified at the Banks V site and the Eoff I site, both in the upper Duck Valley (Kleinhans 1978: 444; Chapman 1978). Regarding the Banks V sample Kleinhans states that the ratio of constituent tempering agents "varied widely from approximately equal mixture of shell and limestone, to a majority of shell and infrequent limestone" (Kleinhans 1978: 444). In the Ducks Nest sample, limestone is generally more abundant than shell in all sherds.

Limestone/Shell Tempered Residual: Sample--24 Body Sherds

Except for their badly eroded condition these sherds are similar in all respects to those described immediately above.

G. Limestone/Clay Tempered Ware

Limestone/Clay Tempered Plain: Sample--4 Body Sherds

These sherds, three recovered from unit level context and one from a posthole in the wall trench of Structure 1, are not referable to a described type, but are virtually indistinguishable from the sample of limestone tempered plain sherds. All are thin, medium gray, and have smoothed interior and exterior surfaces. Temper is not abundant, but includes a mixture of light-gray clay particles suggesting similarities to the Shell/Clay tempered and Clay tempered samples. Including these sherds, however, the frequency of ceramics at the Ducks Nest site which exhibit clay as a constituent tempering agent is only 1.3 percent.

H. Limestone/Chert Tempered Ware

Limestone/Chert Tempered Plain: Sample--3 Body Sherds

These sherds, two recovered from Feature 5 and one from the midden zone in Unit 368N70W, fall within the Elk River ceramic series described by Faulkner (1968b). All are relatively thick, medium-gray in color, and have irregularly smoothed surfaces. In contrast to the sample of this type reported by Davis (1976: 141-143) from the Wiser-Stevens site in the upper Duck Valley, the Ducks Nest sample is tempered with relatively more crushed limestone than crushed chert. Kleinhans (1978: 427) made a similar observation for a sample from the Banks V site. She further suggests that the predominance of limestone may indicate a Middle to Late Woodland transitional type (Kleinhans 1978: 427).

I. Chert Tempered Ware

Chert Tempered Plain: Sample--20 Body Sherds

These sherds, specimens of which were recovered from both unit level and feature context, represent Elk River Plain (Faulkner 1968b; Davis 1976: 136), a type associated with the Late Woodland Mason phase and previously thought to be restricted to the Duck and Elk River valleys of Middle Tennessee. They are relatively thick, dark gray to brown-black, and are tempered with large quantities of coarsely crushed chert, particles of which typically protrude from the surfaces of the sherds.

Chert Tempered Cord Marked: Sample--23 Body Sherds

With the exception of shallow, broadly spaced, typically smoothed over, cord impressions on their exterior surfaces these sherds are identical to those above. They are referable to the type Elk River Cord Marked (Faulkner 1968b: 61-63; Davis 1976: 136), associated with the Late Woodland Mason phase. Although most were recovered from unit level context, seven were recovered from Feature 3, which yielded only chert tempered ceramics.

Chert Tempered Fabric Impressed: Sample--3 Body Sherds

Two of these sherds were recovered from unit level context while the remaining one was recovered from a posthole in the wall trench of Structure 1. Fabric impressed sherds are infrequent in the Elk River ceramic series.

Chert Tempered Knot Roughened: Sample--4 Body Sherds

Features 1 and 76-3, and Units 370N72W and 372N70W each yielded one chert tempered knot roughened sherd (Table 15, page 130). Although these sherds are small, they conform to Elk River Knot Roughened and Net Impressed (Faulkner 1968b: 65-68; Davis 1976: 137).

Chert Tempered Indeterminate Stamped: Sample--1 Body Sherd

This sherd was recovered from the wall trench of Structure 2 in Unit 376N66W. In paste characteristics, color, and thickness it can be identified as belonging to the Elk River ceramic series. It is too small, however, to determine the specific stamped pattern.

Chert Tempered Residual: Sample--23 Body Sherds

Although the chert tempered ceramics are generally well preserved, some sherds are too small and eroded to determine surface treatment.

J. Sand Tempered Ware

Sand Tempered Residual: Sample--2 Body Sherds

These sherds, both small and eroded, were recovered from the midden zone in Unit 372N70W. They are thin, gray-tan in color, and their surfaces have the texture of fine sand paper. Kleinhans (1978: 439) presumes that similar sherds at the Banks V site are Woodland period artifacts. Heimlich (1952: 36), however, notes that undecorated sand tempered pottery is not restricted in temporal distribution and that its occurrence contemporaneous with shell tempered ware is expectable.

Clay Beads: n = 8 (Figure 24D, page 138)

Feature 4 yielded two eroded clay beads. These are made of fired but untempered clay similar in color and texture to that used in manufacturing the limestone tempered and shell tempered pottery. They consist of small irregular clay masses with single straight perforations through the long axes. Their original morphology is indeterminate. In contrast to these, six complete clay beads were recovered from Feature 76-3. They are also of untempered clay. They range from cylindrical, to round, to elongate on the perforated axis, indicating that they were simply formed, probably by finger rolling a small lump of clay around a fiber strand prior to firing. In maximum length and diameter separate specimens measure 9.0mm and 11.1mm, respectively. The perforations are generally 1mm or slightly larger in diameter. Kleinhans (1978: 446) reports similar clay beads from the Banks V site.

Miniature Vessel Fragment

One small untempered sherd, exhibiting a smoothed but undulating and irregular surface, was recovered from Feature 76-3. The paste is homogeneous, compact and medium-gray. Similar sherds, attributed to small vessels formed by hand molding (i.e., pinch pot technique), were recovered at the Banks V site (Kleinhans 1978: 444).

Discussion

The Ducks Nest site ceramic sample presents an interesting problem with regard to Mississippian archaeology. Shell tempered pottery, a traditional marker for Mississippian manifestations, does not constitute a major portion of the collection. In fact, unmixed shell tempered sherds account for only 4.9 percent of the total. Furthermore, this value does not exceed 16.9 percent even if all sherds exhibiting crushed shell as a constituent tempering agent are included.

Instead, the Ducks Nest ceramic sample is composed predominantly of limestone tempered types. Limestone tempered plain and limestone tempered residual sherds account for 63.7 percent of the total collection and 94.7 percent of the limestone tempered sample. The association of limestone tempered, shell tempered, and limestone/shell tempered ceramics has been documented from Mississippian contexts in the Tellico Reservoir (Salo 1969), in the Guntersville Basin (Heimlich 1952), and in the upper Duck Valley at the Banks V and Eoff I sites (Kleinhans 1978; Chapman 1978). In addition, the occurrence of limestone tempered plain vessels with loop handles has also been documented at these localities. To this extent the complex of limestone tempered, shell tempered, and limestone/shell tempered ceramics recovered at the Ducks Nest site is consistent with several previously recorded Mississippian ceramic samples. At no previously reported site, however, do limestone tempered ceramics constitute a majority. At the Banks V site, for example, shell tempered and limestone tempered ceramics account for 65.5 percent and 20 percent, respectively (Kleinhans 1978: 423). A larger proportion of limestone tempered ceramics was recovered at the Martin Farm site, but still only accounted for approximately 25 percent of the total (Salo 1969). An additional observation concerning the Banks V and Martin Farm sites is that they both probably predate the Ducks Nest site by 100-200 years. The Eoff I site, on the other hand, is contemporaneous with the Ducks Nest site. However, at Eoff I shell tempered ceramics account for 67 percent of the collection and limestone tempered ceramics for 17 percent (Chapman 1978).

The ceramic frequencies at the Ducks Nest site, therefore, represent a pattern which is clearly unusual in light of presently available comparative data. Several explanations for this can be convincingly eliminated from the outset. There is no evidence that the high proportion of limestone tempered ceramics represents component mixing derived from an earlier extensive Middle Woodland occupation (Kline 1977: 52). In addition, the similarities between the limestone tempered and shell tempered wares, the presence of limestone/shell tempered sherds, and the occurrence of limestone tempered plain loop handled vessels effectively argues against component mixing. Neither can it be argued that differential vessel fragmentation and preservation are important factors. The shell tempered sample is not composed of larger and better preserved sherds than is the limestone tempered sample. Given the radiocarbon dates from the Ducks Nest site the inescapable conclusion is that limestone tempered ceramics are an important Mississippian trait in the Barren Fork drainage at least into the early twelfth century A.D. Explanation of this is hampered by a virtual lack of additional information on archaeological sites in the Barren Fork drainage. Although the factors responsible may be complex, they may also be very simple. Jolly (1977: 39), in discussing the results of an archaeological survey which covered portions of the Barren Fork and adjacent Collins River drainages, notes that extensive mussel shoals have not developed along these fast flowing tributary streams. The relative absence of shell tempered ceramics at the Ducks Nest site, therefore, may simply indicate that effectively exploitable mussel populations were not present in the area.

Although the association of limestone tempered and shell tempered ceramics is well established, chert tempered ceramics do not appear to constitute a portion of this complex. They are instead attributable to the Elk River ceramic series characteristic of the Late Woodland period in Middle Tennessee. The fact that Feature 3 yielded an unmixed sample of 13 chert tempered sherds, and chert tempered ceramics account for 13.9 percent of the entire collection, documents a Late Woodland component at the Ducks Nest site and extends the known range of Elk River ceramics in Middle Tennessee. At the Mason site in the upper Elk Valley two features containing chert tempered ceramics have been radiocarbon dated at A.D. 770 $\pm$ 85 and A.D. 890 $\pm$ 90 (Faulkner 1968b: 42).

The presence of mixed limestone/chert tempered ceramics at the Ducks Nest site deserves brief mention. On the basis of similar sherds recovered at the Banks V site, Kleinhans (1978: 427) has suggested that because these are predominantly tempered with limestone they may be attributable to a Middle to Late Woodland transitional period. Clearly at the Ducks Nest site it could just as easily be hypothesized that these relate to a Late Woodland-Mississippian transitional period. Whatever the case, at present it cannot be adequately addressed.

As noted in the beginning of this chapter, ceramics are not abundant at the Ducks Nest site. Although this may in part stem from sampling error, an average of only eight sherds was recovered per standardized sample of midden soil floated. In addition, Feature 5 is the only feature which yielded a comparatively large number of sherds, and most of these are probably from the same vessel. Furthermore, although it is impossible to determine vessel morphology and size, rim sherds indicate a maximum of seven vessels. The paucity of ceramics is considered another indication that the Ducks Nest site was occupied for only a short period of time.

CHAPTER VII

ECOFACTUAL REMAINS

A. Introduction

Carbonized botanical remains constitute virtually 100 percent of the ecofactual data recovered at the Ducks Nest site. Undoubtedly due to soil acidity faunal material was not preserved. The entire faunal sample consists of 16.2 grams of fragmented calcined bone; none of which is identifiable--recovered through flotation primarily from Features 4 and 76-3.

B. Archaeobotanical Remains

Through flotation of feature fill, posthole fill, and samples of midden soil, a total of 1051.89 grams of carbonized plant remains was recovered at the Ducks Nest site. Of this total wood, bark, and cane charcoal account for 35.36 percent, plant foods for 7.35 percent, and the remaining 57.29 percent is "sample residue"--i.e., unidentifiable light fraction material (Table 16). These remains were analyzed by Gary D. Crites in the Paleoethnobotany Laboratory at the Department of Anthropology, The University of Tennessee, Knoxville. Each sample was analyzed following a standardized procedure (cf. Yarnell 1974; Crites 1978). The samples were first sifted through 4mm, 2mm, 1mm, and 500 micron mesh screens. The particles retained in the two larger screens

TABLE 16. Archaeobotanical Remains: Summary by Weight and Percent.

Provenience	Total Carbonized Material (g)	Wood/Cane Charcoal (g)	Wood/Cane Charcoal (%)	Bark (g)	Bark (%)	Plant Foods (g)	Plant Foods (%)	Sample Residue (g)	Sample Residue (%)
Features	156.41	8.85	5.65			53.3	34.08	94.36	60.33
Postholes	311.46	148.60	47.71	4.49	1.44	8.66	2.78	149.71	48.07
Unit Midden Levels	584.02	208.37	35.68	1.66	.28	15.40	2.64	358.59	61.40
TOTAL	1051.89	365.82	34.78	6.15	.58	77.36	7.35	602.66	57.29

were sorted, identified, and quantified by weight. Seeds and fruits of wild and cultivated plants were recovered from all screens, counted to genus or species, and weighed as a single component. A binocular microscope with variable magnification from 7X-60X was used for genus/species identification.

Most of the flotation samples did not produce a large quantity of carbonized plant remains. Several, however, yielded too much wood charcoal to warrant identifying all of the fragments. In those instances a riffle sampler was used to provide a sub-sample for identification purposes. Each sub-sample was spread in a serpentine fashion over a sheet of ruled "data pad" paper and pieces of charcoal were removed one at a time from odd-numbered columns until a total of 25 identifications could be made to family, genus, or species level (Crites 1978).

C. Wood/Cane Analysis

As shown on Table 16, wood/cane charcoal accounted for 34.78 percent by weight of the total quantity of carbonized plant remains. Wood and cane were recovered from all provenience units and the occurrence of these by count is provided on Tables 17, 18, 19, and 20. Examination of Table 17 shows that cane accounts for 12.85 percent of the total and that, although eight genera of wood are represented, hickory is by far the most abundant, accounting for 43.24 percent of the total. Before briefly discussing each species represented it should be noted that three of the categories listed are non-specific and consequently will not be discussed. In samples that were small and could be completely analyzed some fragments of wood charcoal could not be

TABLE 17. Wood and Cane Identifications by Count (Site Total).

Provenience	Hickory *Carya* spp.	Oak *Quercus* spp.	Red Oak Group *Quercus* subg.	White Oak Group *Quercus* subg.	Maple *Acer* spp.	Black Willow *Salix nigra*	Elm *Ulmus* spp.	Ash *Fraxinus* spp.	Kentucky Coffeetree *Gymnocladus dioicus*	Persimmon *Diospyros virginiana*	Ring Porous	Diffuse Porous	Cane *Arundinaria* spp.	Unidentifiable Fragments	Total
Features	21	2	8		9	4					8		43	1	96
Postholes	224	25	3	25	3		5	3	2	8	67	7	22	101	495
Unit Midden Samples	172	24	3	16	7			4		9	45	4	66	51	402
Structural Elements	24			3											27
TOTAL	441	51	14	44	19	4	5	7	2	17	120	12	131	153	1020
PERCENT	43.24	5.0	1.37	4.31	1.86	.39	.49	.69	.20	1.67	1.76	1.18	12.84	15.00	100

TABLE 18. Wood and Cane Identifications by Count from Features (Including Structure 2 Wall Trench Fill).

Provenience	Hickory *Carya* spp.	Oak *Quercus* spp.	Red Oak Group *Quercus rubra*	White Oak Group *Quercus alba*	Maple *A er* spp.	Black Willow *Salix nigra*	Elm *Ulmus* spp.	Ash *Fraxinus* spp.	Kentu ky Coffeetree *Gymno ladus dioicus*	Persimmon *Diospyros virginiana*	Ring Porous	Diffuse Porous	Cane *Arundinaria* spp.	Unidentifiable Fragments	Total
Feature 1	5				4						2		6		17
Feature 2		2	4								1			1	8
Feature 4					5								10		15
Feature 76-3	4		4										7		15
Structure 2 Wall Trench Fill	12					4					5		20		41
TOTAL	21	2	8		9	4					8		43	1	96
PERCENT	21.88	2.08	8.33		9.38	4.17					8.33		44.79	1.04	100

TABLE 19. Wood and Cane Identifications by Count from Postholes.

Posthole No.	Hickory *Carya* spp.	Oak *Quercus* spp.	Red Oak Group *Quercus rubra*	White Oak Group *Quercus alba*	Maple *Acer* spp.	Black Willow *Salix nigra*	Elm *Ulmus* spp.	Ash *Fraxinus* spp.	Kentucky Coffeetree *Gymnocladus dioicus*	Persimmon *Diospyros virginiana*	Ring Porous	Diffuse Porous	Cane *Arundinaria* spp.	Unidentifiable Fragments	Total
1	1										2				3
2	7	1								1	1			4	14
3	14				1						4				19
5											3	1		3	7
9	4			2	1										7
10	1														1
13	4	4		3	1					1	2	1		26	42
14													2		2
16	8	2					5				2				17
17	3														3
20		1													1
21	1	3												3	7
24	4										3			1	8
25	13	2									1	1			17

TABLE 19. (continued)

Posthole No.	Hickory *Carya* spp.	Oak *Quercus* spp.	Red Oak Group *Quercus rubra*	White Oak Group *Quercus alba*	Maple *Acer* spp.	Black Willow *Salix nigra*	Elm *Ulmus* spp.	Ash *Fraxinus* spp.	Kentucky Coffeetree *Gymnocladus dioicus*	Persimmon *Diospyros virginiana*	Ring Porous	Diffuse Porous	Cane *Arundinaria* spp.	Unidentifiable Fragments	Total
26														5	5
27		1												4	5
32	15														15
41											3		3		6
43										2	1		13		16
44	1										3	2		2	8
45											3	1		4	8
46	11	1							2		4		1	6	25
48	3	2		10							1				16
49								1			1			2	4
53											1				1
61											2			2	4
65	15														15
71	12														12
72	1										3				4

TABLE 19. (continued)

Posthole No.	Hickory *Carya* spp.	Oak *Quercus* spp.	Red Oak Group *Quercus rubra*	White Oak Group *Quercus alba*	Maple *Acer* spp.	Black Willow *Salix nigra*	Elm *Ulmus* spp.	Ash *Fraxinus* spp.	Kentucky Coffeetree *Gymnocladus dioicus*	Persimmon *Diospyros virginiana*	Ring Porous	Diffuse Porous	Cane *Arundinaria* spp.	Unidentifiable Fragments	Total
76			3												3
77	2										3	1		3	9
78				3										4	7
79	3									1					4
80	5										2			3	10
81	1										1				2
83											4				4
84	3										2				5
85	15														15
88														4	4
90														3	3
95											4				4
96	4	2		5				2		2	2				17
97	3	2									1				6
99	8	4		2						1					15

TABLE 19. (continued)

Posthole No.	Hickory *Carya* spp.	Oak *Quercus* spp.	Red Oak Group *Quercus rubra*	White Oak Group *Quercus alba*	Maple *Acer* spp.	Black Willow *Salix nigra*	Elm *Ulmus* spp.	Ash *Fraxinus* spp.	Kentucky Coffeetree *Gymnocladus dioicus*	Persimmon *Diospyros virginiana*	Ring Porous	Diffuse Porous	Cane *Arundinaria* spp.	Unidentifiable Fragments	Total
101	15										2				17
104														4	4
111	2										1		1	3	7
112	2														2
113	15													1	16
114														6	6
117	3												1		4
118	2										2			2	6
127	1												1	1	3
131	7													1	8
148	15														15
149											3			4	7
TOTAL	224	25	3	25	3		5	3	2	8	67	7	22	101	495
PERCENT	45.25	5.05	.61	5.05	.61		1.01	.61	.40	1.62	13.54	1.41	4.44	20.40	100

TABLE 20. Wood and Cane Identifications by Count from Unit Midden Samples.

Provenience	Hickory *Carya* spp.	Oak *Quercus* spp.	Red Oak Group *Quercus rubra*	White Oak Group *Quercus alba*	Maple *Acer* spp.	Black Willow *Salix nigra*	Elm *Ulmus* spp.	Ash *Fraxinus* spp.	Kentucky Coffeetree *Gymnocladus dioicus*	Persimmon *Diospyros virginiana*	Ring Porous	Diffuse Porous	Cane *Arundinaria* spp.	Unidentifiable Fragments	Total
368N70W(NE1/4)											1			3	4
368N72W	1														1
370N68W	2	1									4			3	10
370N72W(NE1/4)											4			5	9
372N68W	16			1									5	1	23
372N70W	28	2	1	13	5			1		2	5			6	63
372N72W	8		2					3		2			3		18
374N66W	5	2									4			10	21
374N68W	42	7								2	3	2	4	5	65
374N70W	26	2									9		39	8	84
374N72W													9		9
376N66W	15														15
378N66W		1								1	1			3	6

TABLE 20. (ontinued)

Provenien e	Hickory *Carya* spp.	Oak *Quercus* spp.	Red Oak Group *Quercus rubra*	White Oak Group *Quercus alba*	Maple *Acer* spp.	Black Willow *Salix nigra*	Elm *Ulmus* spp.	Ash *Fraxinus* spp.	Kentucky Coffeetree *Gymnocladus dioicus*	Persimmon *Diospyros virginiana*	Ring Porous	Diffuse Porous	Cane *Arundinaria* spp.	Unidentifiable Fragments	Total
378N38W(S1/2)	18	3		1						2	5		6	3	38
378N68W(N1/2)	8	4		1	2						3	2			20
378N70W(SE1/4)	3	2									6	1		4	16
TOTAL	172	24	3	16	7			4		9	45	5	66	51	402
PERCENT	42.79	5.97	.75	3.98	1.74			1.00		2.24	11.19	1.24	16.42	12.69	100

identified beyond the pattern of vessels exhibited in their annual growth ring structure, while others were too small and eroded to be identified at all. The categories "ring porous" and "diffuse porous" represent low level identifications juxtaposing specimens exhibiting discernible differences in size between early-growth and late-growth vessels, and specimens exhibiting no such difference.

Although wood and cane were undoubtedly used for a variety of purposes, the only direct evidence of their use at the Ducks Nest site is for fuel, construction material, and thatch or matting (cane).

Arundinaria spp. (Cane)

The species represented is probably *Arundinaria gigantia* (Giant River cane) (Gary D. Crites, personal communication, 1978). It occurs in a variety of habitats but is most prevalent in low lying or mesic environs such as bogs or low terraces and floodplains. Ethnohistoric accounts document the use of cane for a variety of purposes. The seeds and young shoots were eaten and the stalks were used to make blowguns, arrowshafts, and mats and baskets (Shea 1978: 618). In the southwest quadrant of Unit 374N70W a small section of woven split cane matting or thatch was encountered on the floor of Structure 2.

Carya spp. (Hickory)

Hickory was the most abundant wood at the Ducks Nest site. It was undoubtedly a major constituent in the surrounding forest community, and although it was probably used in a number of ways, it was the principal building material used in both Structures 1 and 2. Twenty-seven fragmentary structural elements were recovered in association with

Structure 2 (Table 17, page 151). Of these, 24 are hickory and 3 are referable to the white oak group. A similar predominance of hickory was recovered from the postholes associated with Structure 1. In addition, hickory was the predominant wood recovered from feature context--indicating its use as a fuel.

Quercus spp. (Oak)

In addition to the genus Quercus, some fragments of oak charcoal could be identified to the red oak (Quercus rubra) and white oak (Quercus alba) groups. Considered in toto oak represents the second most abundant wood at the Ducks Nest site, accounting for 10.68 percent of the total. Three of the 27 structural elements associated with Structure 2 were identified to the white oak group (Table 17). The lower frequency of oak may indicate that it was a secondary constituent of the forest community in the immediate vicinity of the Ducks Nest site.

Acer spp. (Maple)

Maple was recovered from feature, posthole, and midden context, but accounts for only 1.86 percent of the total wood charcoal. Although particular species of maple grow in a variety of habitats, most occur in low mesic environs. Its use as a fuel and possibly as a building material is indicated.

Salix Nigra (Black Willow)

Black willow grows on river margins, swamps and wet environs in floodplains and lower alluvial terraces. Portions of it can be used for food, medicine, and for making baskets (Shea 1978: 622). Only four fragments were recovered--all from fill in the wall trench of Structure 2.

Ulmus spp. (Elm)

All five specimens of elm were recovered from a posthole in the wall trench of Structure 1. Hickory, however, was the predominant wood in that posthole (Table 19, page 153). Species of elm are particularly indigenous to lowland environs, although some species also grow on valley slopes and bluffs. Its presence at the Ducks Nest site is not unexpected, but the specific use to which it was put is unknown.

Fraxinus spp. (Ash)

Most species of ash grow in floodplain zones, but others grow on valley slopes and bluffs. Of the seven fragments recovered, three were from two postholes in the wall trench of Structure 1 and four were in two separate samples of midden soil. Ash is known to have been used for many purposes, such as basketry, bows, arrows, and cradle boards (Shea 1978: 620), but it represents only 0.69 percent of the total wood/cane charcoal sample at the Ducks Nest site.

Gymnocladus Dioicus (Kentucky Coffeetree)

Only two fragments of Kentucky Coffeetree wood charcoal were identified, accounting for only 0.20 percent of the total wood/cane charcoal sample. Both were recovered from a posthole in the wall trench of Structure 1. The majority of the wood in this posthole, however, was hickory. Although Kentucky Coffeetree grows in a variety of habitats, it is typically rare and scattered in all biogeographic zones. Both the seeds and pods it produces are edible.

Diospyros Virginiana (Persimmon)

Persimmon accounts for 1.67 percent of the total wood/cane sample. The trees grow best in floodplain and lower alluvial terrace zones. The root, bark, and wood are known to have been used for medicinal purposes. In addition to the wood recovered, a single persimmon seed was recovered from a flotation sample of midden soil.

Discussion

Nine genera are represented in the cane and wood charcoal recovered at the Ducks Nest site. Of these, hickory is by far the most abundant wood. Whether this indicates intentional selection, or merely reflects the composition of the local forest community cannot be determined at present. However, the latter interpretation is favored. At 10.68 percent, oak is the second most abundant wood, and of the remaining seven genera, maple and persimmon are almost equally represented at 1.86 percent and 1.67 percent, respectively. Black willow, elm, ash, and Kentucky Coffeetree are recognized but minor constituents. Cane is well represented (12.84 percent) and is probably the best indicator for exploitation of lowland plant resources at the Ducks Nest site. All of the wood/cane species recovered, however, would have been accessible within the immediate vicinity of the Ducks Nest site.

D. Plant Foods

Arboreal Seeds

Nut remains constitute 95.09 percent by weight of the total quantity of plant foods recovered. Excluding the family Juglandaceae, which includes specimens that could be either walnut or hickory nut, in order of decreasing abundance identified nuts include hickory nut, butternut, acorn, black walnut, chestnut, and hazelnut (Table 21). In effect, however, the latter five account for only 1.02 percent by weight of the total sample. Of the remaining 98.98 percent, hickory nut shell accounts for 81.63 percent and specimens referable only to the family Juglandaceae account for 17.35 percent.

The abundance of hickory is not unexpected in light of the wood analysis data. The nuts, which are available from September through December, were an important source of food and oil among the Indians of the historic Southeast (Hudson 1976: 286). Asch, Ford and Ash (1972) consider hickory nuts to be a "first line" wild plant food because of their seasonal abundance, high protein content, caloric value, and storability. In addition, hickory nut shell burns with a hot flame and would have made a good fuel. At the Ducks Nest site, Features 4 and 76-3 yielded the largest quantities of hickory nut shell.

Butternut is the second most abundant nut at the Ducks Nest site; but was recovered from only a single flotation sample of midden soil and accounts for only 0.50 percent of the total. The nuts, which can be collected in September and October, have an oily, sweet kernel that would have provided food and oil in much the same manner as hickory nut.

TABLE 21. Provenience Distribution of Arboreal Seeds by Weight.

	Hickory (Carya spp.)	Butternut (Juglans cinerea)	Black Walnut (Juglans nigra)	Juglandaceae	Acorn (Quercus spp.)	hestnut Castanea dentata)	Hazelnut (Corylus spp.)	Total Weight
Feature 1	1.21							1.21
Feature 2	.93							.93
Feature 4	27.33			4.19	.12	.02		31.66
Feature 76-3	16.6				*			16.6
PH 2	1.00			.91				1.91
PH 9	.33			.28				.61
PH 16	.07							.07
PH 21	.09			.06				.15
PH 26	.11			.09				.20
PH 43	1.09		.04	.86				1.99
PH 44	.10			.12				.22
PH 45	.08			.03				.11
PH 46	1.31			.89				2.20
PH 48	.01			.06	.02			.09
PH 72				.08				.08
PH 84	.16			.03				.19
PH 85	.39							.39
PH 86				.07				.07
PH 99				.03				.03
PH 111	.09							.09
PH 112				.03				.03
370N68W (SE1/4) 20-30cm	.11			.13				.24

TABLE 21. (continued)

	Hickory (*Carya* spp.)	Butternut (*Juglans cinerea*)	Black Walnut (*Juglans nigra*)	*Juglandaceae*	Acorn (*Quercus* spp.)	Chestnut (*Castanea dentata*)	Hazelnut (*Corylus* spp.)	Total Weight
370N72W (NE1/4) 20-30cm	.02			.03				.05
372N68W Structure 2 Trench Fill	.21							.21
372N68W 20-30cm	1.33			1.00	.03			2.36
372N70W 20-30cm	3.57	.40		1.89	.01	.01		5.88
372N72W 20-30cm	1.01			.98	.01			2.00
374N66W 20-30cm	.04							.04
374N68W 20-30cm	.03							.03
374N70W (NW1/4) 20-30cm	.51			.33				.84
374N70W (NE1/4) 20-30cm	.16			.04			.02	.22
378N66W 20-30cm	.45			.01				.46
378N68W (S1/2) 20-30cm	1.22			.58	.02			1.82
378N68W (N1/2) 20-30cm	.05				.05			.10
378N70W (SE1/4) 20-30cm	.44			.04				.48
TOTAL	60.05	.40	.04	12.76	.26	.03	.02	73.56
PERCENT	81.63	.50	.05	17.35	.35	.04	.03	100

*Present, less than .01 gram.

Acorn shell constitutes 0.35 percent of the total sample of nut remains. This percentage may be misleading, however, because of the fragile nature of the shell. It has been suggested (Chapman 1975: 228) that the weight of acorn shell should be multiplied by a factor of 10-20 to compensate for probable differential preservation. With this adjustment, acorn would constitute a maximum of 7.07 percent. Some oaks produce a sweet, palatable nut, while others produce a bitter nut high in tannic acid content. Both types, however, were used as a source of food and oil by Indians in the southeast. Asch, Ford and Asch (1972) suggest that because acorn is lower in food energy yield it was used primarily to supplement the more nutritious hickory nut.

The total sample of black walnut was recovered from a posthole in the wall trench of Structure 1. The ripened nuts are available from September through November and although it provides less food energy than hickory, black walnut was used as a food and oil source by southeastern Indians (Swanton 1946: 373-387).

Chestnut was recovered from only Feature 4 and one sample of midden soil. Although chestnut is now almost extinct, it was probably a dominant tree in the upland forests of Tennessee during prehistoric times (Sternitzke 1955: 7). The sweet fruit ripens from August through October and was an important food source to the southeastern Indians. Its general low frequency at archaeological sites is probably due to two factors: (1) differential preservation, and (2) the close resemblance between charred chestnut shell and acorn shell (Shea 1978: 612).

Hazelnut is represented by only .02 grams of charred shell recovered from a single sample of midden soil. Hazelnuts ripen during August and September and would have provided an additional source of food that could have been eaten raw or processed in a number of ways.

Herbaceous Seeds, Fruits, and Grains

Sixteen genera of plants are represented by carbonized seeds or other plant parts. These account for 4.91 percent of the plant foods recovered and in order of decreasing abundance include knotweed, goosefoot, Maygrass, maize, sumpweed, morning glory, grape, honey locust, a legume, blackberry/raspberry, squash, clover, persimmon, black haw, sumac, and squash/gourd (Table 22). The latter nine species, however, are represented by no more than two specimens each and consequently account for only 1.09 percent of the total. Although herbaceous seeds, fruits, and grains were recovered from a variety of contexts, 94.44 percent of the total were recovered from Feature 4. The genera represented are discussed below in order of abundance.

Polygonum spp. (knotweed, smartweed). Most members of the genus Polygonum, 27 species and varieties of which are known in Tennessee (Shea 1978: 625), are small herbaceous annuals that grow in disturbed habitats. Use of knotweed has been documented both archaeologically and ethnohistorically (Fernald and Kinsey 1943: 173-176; Yarnell 1976: 269). The roots, shoots and leaves can be used as potherbs and the small seeds, which mature in middle to late summer, can be crushed into meal and added to breads and stews. Three hundred and seventy Polygonum seeds were recovered--all except one coming from Feature 4.

TABLE 22. Provenience Distribution of Herbaceous Seeds, Fruits, and Grains by Count.

Provenience	Goosefoot *Chenopodium* spp.	Knotweed *Polygonum* spp.	Maygrass *Phalaris caroliniana*	Sumpweed *Iva annua*	Clover *Trifolium* spp.	Morning Glory *Ipomea* spp.	Honey Locust *Gleditsia triacanthos*	Persimmon *Diospyros virginiana*	Black Haw *Viburnum* spp.	Sumac *Rhus* spp.	Legume Leguminosae	Grape *Vitis* spp.	Blackberry/Raspberry *Rubus* spp.	Squash *Cucurbita pepo*	Squash/Gourd Cucurbitaceae	Corn *Zea mays*	Unidentified Seeds	Total
Feature 2																	2	2
Feature 4	342	369	248	9	1	1	2				1			2		2	143	1120
Feature 76-3																5		5
Posthole 2													1					1
Posthole 9																1		1
Posthole 13																2		2
Posthole 26																3		3
Posthole 46	1															4	1	6
Posthole 48									1									1
Posthole 72																	2	2
Posthole 85																	1	1
Posthole 113	1		1									1			1			4
370N68W (SE1/4) 20-30cm																1		1
372N68W 20-30cm	1											2						3
372N70W 20-30cm	4	1				7		1		1		3	1			4	6	28
372N72W 20-30cm											1					8		9
378N68W (N1/2) 20-30																1		1
378N68W (S1/2) 20-30cm																1		1
TOTAL	349	370	249	9	1	8	2	1	1	1	2	6	2	2	1	32	155	1191
PERCENT	29.30	31.07	20.91	.76	.08	.67	.17	.08	.08	.08	.17	.50	.17	.17	.08	2.69	13.01	100

Chenopodium spp. (goosefoot). Like Polygonum, Chenopodium is a herbaceous annual that quickly invades disturbed ground. Virtually all parts of it are edible. The roots, shoots and leaves, available in the spring and summer, can be cooked as potherbs and the small black seeds can be harvested, ground into meal and added to breads or cooked as a porridge (Hudson 1976: 287). Though most Chenopodium was recovered from Feature 4, a small number of seeds came from other contexts.

Phalaris caroliniana (maygrass). Third in abundance of herbaceous annuals that quickly invade disturbed habitats was maygrass. It is an early maturing plant that produces seeds from late spring through summer. These could have been used as a food in much the same manner as Polygonum or Chenopodium. It is suggested that all three of these grew in the immediate vicinity of the Ducks Nest site. Feature 4 yields all but one of the maygrass seeds recovered.

Zea mays (corn). The 32 fragments of maize recovered at the Ducks Nest site include complete and/or fragmentary grains (kernels), glumes, cupules, and a small cobb fragment. These are listed separately in Table 23 and where possible measurements and row counts are provided. Of eleven specimens on which it was possible to determine row count, two represent eight-rowed ears, six represent ten-rowed ears, three represent twelve-rowed ears, and one could be from either a ten- or twelve-rowed cobb. The mean row number is 10.2, and median cupule width on ten specimens is 5.0mm. The eight-rowed samples and possible also the ten- and twelve-rowed samples, are of the Eastern Complex or Northern Flint type (Yarnell 1964: 107). Maize was recovered from feature,

TABLE 23. Zea Mays Remains.

	Fragment Type						
Provenience	Grain	Glume	Cupule	Cob	Row Number	Grain Width	Cupule Width
Feature 4			X		12		4.0mm
Feature 4				X*			
Feature 76-3	X*						
Feature 76-3	X*						
Feature 76-3	X*						
Feature 76-3	X*						
Feature 76-3	X*						
Posthole 9	X				12	7.0mm	
Posthole 13			X		10		4.9mm
Posthole 13			X		10		5.1mm
Posthole 26	X*						
Posthole 26	X*						
Posthole 26			X		10		5.3mm
Posthole 46			X		10		5.0mm
Posthole 46			X*				
Posthole 46			X*				
Posthole 46	X*						
370N68W(SE1/4) 20-30cm	X*						
372N70W 20-30cm		X*					
"			X		10 or 12		3.5mm
"	X				12	5.0mm	
"	X*						

TABLE 23. (continued)

	Fragment Type						
Provenience	Grain	Glume	Cupule	Cob	Row Number	Grain Width	Cupule Width
372N72W 20-30cm		X*					
"				X	8		7.2mm
"				X	8		6.1mm
:				X	10		4.9mm
"				X*			
"				X*			
"				X*			
"				X*			
378N68W(N1/2) 20-30cm				X	10		5.0mm
378N68W(S1/2) 20-30cm		X*					

NOTE: n = 32.
Mean row number = 10.2
Median cupule width = 5.0mm.

*Specimens too fragmentary for measurement.

posthole, and midden context at the Ducks Nest site, but was not abundant in any particular flotation sample. Although Feature 4 yielded 94 percent of all herbaceous seeds, fruits, and grains, only two specimens of maize were recovered in its fill.

Iva annua (sumpweed, marsh elder). Nine complete and/or fragmentary Iva annua achenes were recovered from Feature 4. Sumpweed, or marsh elder, is a herbaceous annual which thrives in moist and disturbed habitats and which bears seeds from September through November. Although only a wild form is known today, a variety designated Iva annua var. macrocarpa (Blake) Jackson is known only from archaeological sites (Black 1963; Jackson 1960; Yarnell 1972). Since the achenes of this variety are considerably larger than those of extant species, Iva annua var. macrocarpa is considered to be an early native cultigen occurring by the Early Woodland period (Yarnell 1976). Only one of the Ducks Nest specimens is complete. Its reconstructed measurements and some comparative data are presented in Table 24. The Ducks Nest specimen falls within the size range of presumably cultivated Mississippian Iva. There is no ethnohistoric account for the use of Iva, but Yarnell (1972) suggests that since the seeds have a high fat content they may have served primarily as a source of oil.

Ipomea spp. (morning glory). The eight seeds of morning glory recovered could easily have been deposited by natural forces. Although Indians in the Southeast used the roots for food and medicinal purposes (Hudson 1976: 285; Banks 1953: 106), no use of the seeds, which ripen from July through October, is known. One native species of morning

TABLE 24. Comparative Iva Annua Achene Reconstructions.*

Site	Date	n	Length-Width** Ranges	Mean Length-Width	L x W Index
Ducks Nest	AD 1140	1***	5.6 X 4.6	5.6 X 4.6	25.8
Friend and Foe, MO.	AD 1100	6	4.1-6.2 X 2.6-3.9	5.5 X 3.7	20.4
Warren-Wilson, N.C.	AD 1250-1450	6	4.8-6.6 X 3.9-4.8	5.9 X 4.3	25.4
Paul McCulloch, MO.	AD 1100-1200	19	5.5-8.8 X 3.9-5.3	7.0 X 4.5	31.5
Turner-Snodgrass, MO.	AD 1300	33	6.0-8.7 X 3.6-5.3	7.3 X 4.5	32.8
Proether, MO.	?	10	6.0-8.0 X 4.5-6.0	7.0 X 5.2	36.4

*Data compiled by Richard A. Yarnell.

**Measurements in millimeters.

***The remaining eight Iva annua specimens recovered at the Ducks Nest site consist of two immature achenes, one immature seed, four achene fragments, and one seed fragment.

glory, Ipomea pandurata, is common to dry woods and upland zones (Shea 1978: 627).

Vitis spp. (grape). Six grape seeds were recovered: five from midden zone context and one from a posthole in the wall trench of Structure 1. These could belong to any one of several species of wild grape common in the Eastern Highland Rim (Shea 1978: 613). The fruits are edible when ripe from August through October.

Gleditsia triacanthos (honey locust). Two honey locust seeds were recovered from Feature 4. The ripe pods of honey locust contain a sweet pulp which was dried and ground by Indians in the Southeast for a sweetener and beverage (Hudson 1976: 287). Although the seeds were not utilized as a food source, their presence suggest use of the pods. The fruits ripen from September through October, but may persist until winter.

Legume (Leguminosae). The two legumes recovered at the Ducks Nest site may easily be chance inclusions. As annuals that grow on alluvial soil and disturbed ground, legumes were probably present near the site. During the summer when they ripen and disperse their seeds they may have been inadvertently gathered with other foods. Since legumes do not preserve well, however, the possibility remains that they were intentionally gathered.

Rubus spp. (blackberry/raspberry). The presence of two blackberry/ raspberry seeds may also be fortuitous. If not, they are an indication of summer occupation at the Ducks Nest site. It is likely, of course, that berries were in fact exploited but were eaten whole and consequently, are generally under-represented in the archaeological record.

Cucurbita pepo (squash). Only two small fragments of squash were recovered at the Ducks Nest site--both from Feature 4. In addition, one fragment that may be either squash or gourd (listed as Cucurbitaceae on Table 22, page 168) was recovered from a posthole in the wall trench of Structure 1.

Trifolium spp. (clover). One clover seed was recovered from Feature 4. Although this may be an incidental inclusion, the seeds are known to have been used as a breadstuff, the young foliage as a potherb, and the dried flowers for tea (Fernald and Kinsey 1943: 246; Yanovski 1936: 39). The seeds and flowers are available from April through September.

Diospyros virginiana (persimmon). Persimmon was the most important wild fruit among the Indians of the Southeast. It was used to make cakes, breads, candies and beverages (Hudson 1976: 295-296). Although persimmon has been recovered from a variety of archaeological sites, its general low representation may reflect differential preservation or the fact that the fruits were entirely ingested. Persimmons are sour until fully ripened from October through November. A single seed was recovered at the Ducks Nest site.

Viburnum spp. (black haw). One black haw seed was recovered from a posthole in the wall trench of Structure 1. This may be an incidental inclusion, but the trees are most common in low mesic habitats, not higher more well drained ones. The seeds ripen in September and October, but no use has been reported for them.

Rhus spp. (sumac). One sumac seed was recovered from unit level context. Several species of *Rhus* would have probably been available in the immediate vicinity of the Ducks Nest site. The fruits ripen from June through October and are known to have been used for beverages and medicines (Shea 1978: 627). As with persimmons and berries, their low frequency may reflect differential preservation, total ingestion, or lack of exploitation.

D. Summary Discussion

The study of prehistoric subsistence is a major focus of contemporary archaeology. New recovery techniques specifically designed to extract ecofactual remains have been developed and the identification and analysis of these remains is becoming progressively more refined. The fact remains, however, that both natural and cultural processes affect the recovery of ecofactual remains from archaeological sites (cf. Schiffer 1975) and in virtually no case can floral and faunal samples be accepted at face value as quantitatively representative of prehistoric dietary patterns. From a single site in an area as unknown archaeologically as the Barren Fork drainage it is not possible at present to adequately deal with influences stemming from specific patterns of prehistoric human behavior. However, the operation of natural processes, especially those adversely effecting the preservation of ecofactual remains, is evident at the Ducks Nest site and must be acknowledged. For example, virtually no faunal remains were recovered. The presence of small calcined fragments of animal bone, however, indicates that hunting was practiced and, given the quantity of projectile points/knives and biface/knives in the artifactual assemblage, may have been a very important subsistence activity. Similarly, the relative importance of specific plant foods cannot be judged on the basis of quantity. The constituent plant taxa, however, do provide insights into that portion of the overall subsistence pattern.

Among the archaeobotanical remains recovered both wild and domesticated food sources are represented. Of the wild plant foods, nuts as a group were probably the most important. Although hickory nut probably provided the greatest contribution to the diet, a variety of other nuts, including acorn, black walnut, butternut, chestnut and hazelnut were also utilized. These would have been easily harvested in the fall and could have provided an excellent storable food rich in oil, calories, and other nutrients.

Of the remaining wild plant foods, or potential foods, most occurred in only very small amounts. As previously mentioned this may not reflect their actual dietary importance. Nonetheless, clover, morning glory, honey locust, black haw, sumac, wild bean, and grapes and berries were probably supplemental foods that provided variety in the diet. On the other hand, goosefoot, knotweed, and maygrass may have been relatively more important. Since these plants quickly invade disturbed habitats, their presence around the structures and in cleared garden plots would be expected. Two of these in fact, goosefoot and knotweed, are considered by some paleoethnobotanists to be early native

American cultigens in a complex which also includes sumpweed (Yarnell 1976: 269). Whether this is the case or not remains to be seen. Minimally the data indicate that a domesticated form of Iva was present at the Ducks Nest site. This should not be taken to imply that the goosefoot and knotweed were also cultivated; but that possibility should not be dismissed.

Two of the triad of cultivated plants typically associated with Mississippian subsistence economy were recovered: maize and squash. No beans (Phaseolus vulgaris), were recovered. Neither beans nor squash preserve well, however, and their presence at open sites is usually contingent upon a particularly favorable set of preservation circumstances.

Aside from hickory nut, maize was the most widely distributed of any plant food recovered at the Ducks Nest site. The importance of maize in Mississippian socioreligious and economic systems is undeniable. However, making the tacit assumption that maize provided the dietary staple at all Mississippian sites, is unwarranted. Again, the problems of preservation, methods of preparation, and storage and interpreting the nutritional significance of a particular food on the basis of quantitative considerations must be acknowledged. Although present data are inadequate to demonstrate the range of variation exhibited among Mississippian sites, they do indicate that not all small sites represent agricultural farmsteads (cf. Smith 1978: 12). Small sites could have been established for a variety of purposes not directly associated with agriculture. It would not, however, be unexpected to find small quantities of maize and other cultigens at sites that (for example) were established as hunting stations or for the exploitation of arboreal seed crops. In addition, it may have been necessary for Mississippian groups to disperse and take advantage of a variety of wild resources following a season of poor maize harvest. The possibility that Mississippian adaptation in headwater drainage areas differ considerably from those in the major river valleys must also be considered.

The plant food data provide the only direct means of determining the time(s) of year that the Ducks Nest site was occupied. The seasonal occurrence of the parts of the plants which are represented generally extends from summer through autumn (Table 25). Arguing that the site was actually occupied during this period is logical, but admittedly carries the assumption that the plants were in fact grown during the period of time the site was occupied rather than carried in from another location to be used as a stored food supply through a fall-winter occupation.

Several indirect lines of evidence suggest, however, that the Ducks Nest site was probably occupied on a year round basis and consequently that the plant foods recovered reflect on-site subsistence pursuits. Both structures were substantially built and would have been suited to year round habitation. In addition, the presence of a definite storage facility and the probability that all the artifact raw materials and ecofactual remains could have been procured within a short distance of the site supports the proposition of a year round occupation.

In sum, the constellation of plant foods recovered at the Ducks Nest site reflects a pattern which is increasingly characteristic of Mississippian subsistence. It can no longer be convincingly argued

TABLE 25. Probable Seasonal Deposition of Plant Remains.

Plant	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Carya spp.						x	x	x	x
Juglans cinerea						x	x	x	
Juglans nigra						x	x	x	
Quercus spp.						x	x		
Castanea dentata					x	x	x		
Corylus spp.					x	x			
Chenopodium spp.					x	x	x	x	
Polygonum spp.			x	x	x	x	x	x	
Phalaris caroliniana		x	x						
Iva annua						x	x	x	
Trifolium spp.	x	x	x	x	x	x			
Ipomea spp.				x	x	x	x		
Gleditsia triacanthos						x	x		
Diospyros virginiana							x	x	
Viburnum spp.						x	x		
Rhus spp.			x	x	x	x	x		
Leguminosae			x	x	x	x	x		
Vitis spp.					x	x	x		
Rubus spp.			x	x					
Cucurbita spp.					x	x	x		
Zea mays				x	x	x	x		

that the development of agriculture led to a truncation in the exploitation of wild plant food resources. At the Gypsy Joint site (Smith 1978), the Banks V site (Kleinhans 1978; Shea 1978), and several sites in the Black Bottom of southern Illinois (Muller et al. 1975), as well as the Ducks Nest site, cultigens are only one component in a diverse suite of plant food resources.

CHAPTER VIII

TEMPORAL POSITION

Because Structures 1 and 2 burned, a large amount of wood charcoal was recovered in direct association with each. Six radiocarbon samples, three from each structure, were submitted to the Geochronology Laboratory of the University of Georgia for age determination. The selection of these samples was tightly controlled. All six samples were hickory charcoal from large sections of posts or structural elements. In addition, heartwood was excluded from the samples in order to avoid introducing material that might bias the results toward early dates. Of the three Structure 1 samples, two were taken from postholes in the wall trench, while one was taken from the southernmost interior support post. The three Structure 2 samples were from either roof or wall members recovered on the floor. In Table 26, both the uncorrected and corrected dates have been provided (the corrected dates were interpolated from tables provided by Damon et al. 1974). Only the corrected dates will be considered in the following discussion. Finally, the laboratory determinations were calculated on the basis of the 5568 $\pm$ 30 years half-life of carbon-14 and the σ (sigma) value presented represents one standard deviation from the mean.

Since the three dates from each structure can logically be assumed to effectively represent a single point in time, averaging them is a justifiable procedure. However, as invariably happens with a series of

TABLE 26. Ducks Nest Site Radiocarbon Dates.

Sample No.	Provenience	Uncorrected Date	Corrected Date
UGa-2163	Structure 1	785 ± 55 BP (AD 1165)	788 ± 63 BP (AD 1162)
UGa-2164	Structure 1	920 ± 55 BP (AD 1030)	913 ± 63 BP (AD 1037)
UGa-2165	Structure 1	855 ± 55 BP (AD 1095)	853 ± 63 BP (AD 1097)
UGa-2160	Structure 2	610 ± 55 BP (AD 1340)	629 ± 63 BP (AD 1321)
UGa-2161	Structure 2	775 ± 55 BP (AD 1175)	779 ± 63 BP (AD 1171)
UGa-2162	Structure 2	835 ± 55 BP (AD 1115)	834 ± 63 BP (AD 1116)

NOTE: Average of Structure 1 dates = 851 ± 36 BP (AD 1099).
Average of Structure 2 dates = 747 ± 32 BP (AD 1203).
Average of Structure 2 dates excluding UGa-2160 = 807 ± 45 BP (AD 1143).

radiocarbon dates one or more will often appear to be anomalous and intuitively should not be included. Long and Rippeteau (1974: 208) provide an objective means of rejecting dates which, though statistically valid, would bias a relatively small number of values. According to the "criterion of Chauvenet" dates may be rejected if they have a probability of occurrence of less than $\frac{1}{2n}$, where n = number of dates being averaged. Therefore, if three dates are averaged, any with a probability of occurrence of less than 0.167, or greater than 1.38σ from the total group mean, may be rejected. Employing the criterion of Chauvenet, four steps are involved in averaging a series of radiocarbon dates. First, the laboratory determinations are corrected (cf. Damon et al. 1974). Second, the corrected dates are averaged using one of two formulas provided by Long and Rippeteau (1974: 207-208). Since all of the dates from the Ducks Nest site have identical sigma values, the following formula is used for calculating averages:

$$\frac{\sum {}^{14}C_i}{n} \pm \frac{\sigma_i}{\sqrt{n}}$$

where $\sum$ is the summation operator, ${}^{14}C_i$ is each of the dates to be averaged, n is the number of values averaged, and σ_i is the single identical σ value of all the dates. Third, Chauvent's criterion for rejection is employed to calculate a range of dates within which specific determinations should fall if they are to be included in the average. Long and Rippeteau, however, do not state whether the inclusion or exclusion of specific dates is based solely upon their mean values or upon their range as determined by the original sigma value. Both alternatives are presented below. The final step is to recalculate the mean, using the formula presented above, excluding any rejected values.

The three Structure 1 dates represent a range of approximately 125 years, from 913 ± 63 years B.P. to 788 ± 63 years B.P. (A.D. 1037-1162). Averaging these yields a date of 851 ± 36 years B.P. (A.D. 1099). As previously stated, when applying Chauvenet's criterion in averaging three dates, any with a probability of occurrence of less than 0.167 (greater than 1.38σ from the total group mean) may be eliminated. The sigma of the total group mean in this case is ± 36 years. Consequently 1.38σ is ± 50 years and the range established for including and excluding specific dates, determined by adding and subtracting 50 years to the group mean, becomes 901-801 years B.P. (A.D. 1049-1149). If the mean value of each corrected date is considered as the basis for rejection or inclusion then both the earliest and latest of the Structure 1 dates would be rejected, leaving the single date of 853 ± 63 years B.P. (A.D. 1097). On the other hand, if the original sigma value of the corrected dates is considered then the three Structure 1 dates overlap within the range established by Chauvenet's criterion and none need be rejected. The average date of 851 ± 36 years B.P. (A.D. 1099) stands as is with no recalculation necessary. In either case a mean date of approximately A.D. 1100 is established for Structure 1.

The three Structure 2 dates are much more internally inconsistent than those from Structure 1.. They exhibit a range of approximately 205 years, from 834 ± 63 years B.P. to 629 ± 63 years B.P. (A.D. 1116-1321), and when averaged produce a date of 747 ± 36 years B.P. (A.D. 1203). However, when compared with the other Structure 2 dates, it is intuitively obvious that the date of 629 ± 63 years B.P. (A.D. 1321) is probably in error and should not be included. The parameters of Chauvenet's criterion for rejection are the same in this case as they were for the Structure 1 dates. Since the sigma of the total group mean is ± 36 years, 1.38σ is ± 50 years. Adding and subtracting this value from the mean of 747 years B.P. produces a range for acceptable dates of from 797-697 years B.P. (A.D. 1153-1253). As was the situation with the Structure 1 dates, if only the mean value of each corrected date is considered as the basis for rejection, then both the earliest and latest of the Structure 2 dates would be rejected and the single date of 779 ± 63 years B.P. (A.D. 1171) would remain. If the sigma range of the corrected dates is considered, however, only the most recent date (629 ± 63 years B.P., A.D. 1321) is rejected and the remaining two may be averaged. Doing so results in a date for Structure 2 of 807 ± 45 years B.P. (A.D. 1143).

The two mean dates of 851 ± 36 years B.P. (A.D. 1099) and 807 ± 45 B.P. (A.D. 1143) for Structures 1 and 2, respectively, are thought to accurately reflect the temporal position of the Mississippian occupation at the Ducks Nest site. It has been previously argued that the manner in which Structures 1 and 2 are superimposed, the general architectural similarities between the two, the lack of an extensive and dense midden, and the relative low density of artifactual remains all suggest that the site was not occupied over an extended period of time or that the temporal gap between the two occupations was of long duration. Given present data it is not possible to be more precise about the duration of occupation. It can only be suggested that the Ducks Nest site was occupied for a short time during the first four decades of the twelfth century A.D.

CHAPTER IX

SUMMARY AND CONCLUSIONS

In the preceding chapters the Mississippian component at the Ducks Nest site has been described with a modicum of interpretive evaluation. The goal of this chapter is three-fold. First, an attempt will be made to synthesize the diverse lines of evidence into an overall evaluation of the settlement type represented by the Ducks Nest site. Second, comparative information will be drawn upon to evaluate the similarities and differences exhibited between the Ducks Nest site and the few other small Mississippian sites which have been reported in the literature. Finally, some ideas and hypotheses concerning Mississippian settlement in the Barren Fork and Collins River drainages will be discussed.

The problem area addressed in this thesis is that of documenting the range of variation represented among small Mississippian sites in an attempt to better understand the manner in which these were articulated into larger systems of settlement and subsistence. From a systems perspective, however, knowledge does not derive from an understanding of isolated parts. More important than understanding the diverse parts that constitute a system is understanding the interdependent relationships that exist among those parts. This is, in fact, the essence of any system. Since the Ducks Nest site represents the only excavated site in the Barren Fork drainage, and since only twelve other

Mississippian sites are known from surface reconnaissance in the immediately adjacent Collins River area (Jolley 1977), it is premature to hope to deal conclusively with this problem. The Ducks Nest settlement could, in fact, fit equally well into a variety of different settlement systems.

In evaluating the type of settlement represented by any archaeological site at least five factors must be taken into consideration: (1) seasonality of occupation, (2) duration of occupation, (3) site location and potentially exploitable resources, (4) size and composition of the resident social group, and (5) the range of activities undertaken at the site. With regard to the first of these, the archaeobotanical remains provide the only direct evidence for assessing the seasons of the year that the Ducks Nest site was occupied. Most of the plant foods would have become available primarily in the fall. On the other hand, cultigens and such wild plant foods as berries and maygrass indicate a summer occupation as well. Although this evidence suggests a late spring through fall occupation of the Ducks Nest site, lines of indirect evidence such as the substantially built and superimposed structures, the presence of a storage facility, and the probability that all of the artifactual raw material and ecofactual remains were procured within a short distance of the site suggest that occupation was on a year round basis.

With regard to the duration of occupation at the Ducks Nest site it is impossible to provide a precise assessment. The temporal control provided by radiocarbon dating is clearly inadequate to determine the length of time that either structure was occupied. The only lines of evidence bearing on this problem are few and indirect. The thickness of the midden accumulation and the small quantity of artifactual remains suggest that the total length of occupation was of short duration. Although impossible to conclusively demonstrate, it is thought that the total length of occupation did not exceed three to four years and that Structure 2 probably represents a rebuilding episode which immediately followed the burning of Structure 1.

The fact that the Ducks Nest site is situated on a ridge top stands in contrast to the traditional predictive location of Mississippian sites. It is probable, however, that small upland Mississippian sites are present in other localities as well but simply have not been encountered due to survey bias. The upland location of the Ducks Nest site cannot be employed per se to argue that it represents a hunting and/or arboreal seed gathering station. From the structure locus a variety of both upland and lowland resources could have been exploited. This would also have been true, of course, had the site been located on the terrace or floodplain. This latter location is most typical of Mississippian settlement and carries with it the general implication that proximity to suitable agricultural soil was the overriding factor determining site location. If on the other hand agricultural products did not provide the dietary staple, and other considerations were more important, then other localities would be favored. Although it would have been more difficult from the ridge top to protect agricultural crops planted on the lower terraces or floodplain from wild animals, the presence of Cumberland silt loam directly adjacent to the structure locus may indicate that crops were grown there instead. The upland setting would have provided an optimal location from which to gather nuts when they ripened in the fall and would have also been optimal for hunting animals drawn to the rich fall mast of the upland slopes and ridges. In sum, it is probable that upland subsistence resources were of greater importance to the Ducks Nest site inhabitants than was the necessity, or desirability, of locating their settlement in the bottomlands where productive agricultural soils were present.

There is no good basis for determining the size or composition of the social group that occupied the Ducks Nest site. The most generally used measure of resident group size has been total living floor area. The adequacy of this, however, can be seriously questioned and the several schemes that have been developed to estimate population size from floor area produce quite different results (cf. Smith 1978: 181). Consequently, no attempt will be made to specifically calculate group size for the Ducks Nest site. Although Structure 2 is smaller than Structure 1 the difference is not great enough to suggest a significant change in either resident group size or composition. Both structures probably were occupied by a nuclear or limited extended family group.

The range of activities undertaken at the Ducks Nest site, as indicated by the artifactual and ecofactual remains, suggests a settlement that was trophically self-sufficient. Wild plant foods were gathered, domesticated crops were grown, animals were hunted, and locally available materials were used to make necessary procurement and processing implements. Although faunal remains were not preserved, the high frequency of projectile points/knives and biface/knives suggest that hunting was an important activity. The apparent importance of hunting as opposed to other subsistence activities, however, may stem from the fact that evidence for the latter activities is generally less visible archaeologically.

In summary, the evidence from the Ducks Nest site suggests that it was a trophically self-sufficient settlement probably occupied on a year round basis over a limited number of years by a small social group. Additionally, the lack of exotic raw materials and artifacts indicate that this group was largely autonomous.

As previously stressed, the available comparative data for small Mississippian sites is very limited. No other Mississippian sites, large or small, have been excavated in the Barren Fork drainage area and only five small Mississippian sites have been reported from other localities: three in the upper Duck Valley, one in the upper Elk Valley, and one in southeast Missouri.

In the upper Duck Valley the Parks site (Brown n.d.), the Eoff I site (Chapman 1978), and the Banks V site (Kleinhans 1978) have all yielded small Mississippian components. These sites, however, are all located on alluvial terraces in the lower zone of the Normandy Reservoir. They are thought to represent small nuclear family farmsteads occupied on a year round basis and located to take advantage of rich alluvial bottomland soils for farming. All three sites are similar. In each case a single small wall trench structure with supportive facilities was present. None of the structures, however, approach the size of even the smaller structure at the Ducks Nest site. Aside from this difference, and the contrast in site location apparently reflecting greater reliance on domestic crops, however, the Duck Valley sites are very similar in overall configuration to the Ducks Nest site. There is no evidence in the upper Duck Valley for a large resident Mississippian population or for the presence of more nucleated types of settlement. Faulkner (1975: 90), consequently, has characterized the Mississippian occupation of the upper Duck Valley as one of dispersed nuclear family farmsteads situated on broad terraces in areas of productive agricultural soil.

In the upper Elk Valley a Mississippian component has been reported at the Brickyard site (Butler 1968). Although the Mississippian settlement at this site may be larger than that the the Ducks Nest site, in several ways the Brickyard site is comparable. It is situated on a high terrace or knoll above the Elk River in a setting very similar to that of the Ducks Nest site. In addition, excavation revealed the presence of a structure which in size, plan, and pattern of interior support posts is very similar to Structure 1 at the Ducks Nest site. Although the Brickyard structure is reported as a single post dwelling lacking wall trenches, it has been suggested (Charles H. Faulkner, personal communication, 1978) that wall trenches may have been present, but shallow and consequently missed during excavation.

In virtually all aspects the Gypsy Joint site of the southeast Missouri Middle Mississippi Powers phase closely resembles the sites previously discussed. The same type of overall settment pattern, however, is probably not represented among the different localities. In the Powers phase area the Gypsy Joint site is articulated into a settlement system consisting of one major palisaded settlement, several palisaded villages, a number of single and double-structure sites, and special activity loci (Smith 1978: 199). Unfortunately, the upland settlements that are known to be a part of the overall Powers phase settlement system have not been reported upon as yet. The Gypsy Joint site, located on a low sand ridge in the floodplain, consisted of two structures with associated inside and outside activity areas. One structure was of wall trench construction and has been interpreted as a winter house. The other was a single post structure and is thought to represent a summer dwelling. The Gypsy Joint site, consequently, has been interpreted as a trophically self-sufficient nuclear family homestead occupied for a short period of time on a year round basis.

In a recent survey of the headwaters of the Caney Fork River Jolley (1977) reports twelve sites which yielded evidence of Mississippian occupation. Of these, all but one are located on upland ridges, in coves, or in rockshelters; a pattern in contrast to typical ideas of Mississippian settlement. Although little is known about any of these sites, an important observation is that three have platform mounds in association. Jolley's contention that the overall settlement pattern is one of dispersed small habitation sites is in need of further investigation. The presence of mound sites does not necessarily contradict this notion, but may at the same time indicate that the overall settlement pattern may not deviate markedly from that exhibited in other areas.

In conclusion, the data from the Ducks Nest site and the minimum amount of additional data presently available raise many questions concerning Mississippian settlement in the Barren Fork drainage and this general area of the Eastern Highland Rim in Middle Tennessee. Whether or not Mississippian settlement in this area is qualitatively different from that in other areas cannot be determined at present. As with any investigation of settlement systems, an integrated research program designed to document the range of variability among settlement types is needed in order to determine the specific nature of Mississippian settlement represented. The Ducks Nest site could, in fact, fit into a variety of different settlement systems. As implied by Jolley (1977:32) the settlement system may exhibit a continuation of Woodland patterns, with a low density population dispersed into small habitation sites. Alternatively, future research may show that the Mississippian settlement in this portion of the Eastern Highland Rim does not differ greatly from that expressed in other localities. There may, for example, be hierarchical site structuring. Relatively large populations may have been centered at mound complexes and these may have dispersed on a seasonal or periodic basis. It is additionally possible that mound sites were visited only periodically for observance of important socio-religious ceremonies by the dispersed segments of a larger population aggregate. Whatever the case, the Ducks Nest data document the presence of a trophically self-sufficient settlement probably occupied on a year round basis over a limited number of years by a small social group.

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