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A NATIONAL REGISTER EVALUATION OF THE JENKINS HOUSE SITE AND A PHASE ONE INVENTORY OF ARCHEOLOGICAL SITES IN THE GALLIPOLIS MITIGATION SITE AT GREENBOTTOM CABELL COUNTY, WEST VIRGINIA

Edited by

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June 15, 1989

FINAL REPORT

A NATIONAL REGISTER EVALUATION OF THE JENKINS HOUSE SITE (46CB41) AND A PHASE ONE INVENTORY OF ARCHEOLOGICAL SITES LOCATED AT THE GALLIPOLIS MITIGATION SITE AT GREENBOTTOM CABELL COUNTY, WEST VIRGINIA

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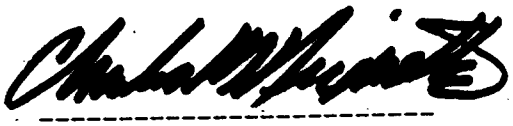

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ABSTRACT

During November, 1988, and April, 1989 Cultural Resource Analysts' personnel completed an archeological study in the Gallipolis Mitigation Site at Greenbottom in Cabell County West Virginia. A total of 836 ac were subject to pedestrian survey; and as a result, a total of 18 sites were investigated. Of these, three sites had been recorded previously (46CB15, 46CB40, and 46CB41), and fifteen new sites were documented. Of the fifteen new sites, eight were prehistoric, four were historic, and three sites had both historic and prehistoric components. In addition, a National Register evaluation was conducted for the historic component at the Jenkins House Site (46CB41).

The Jenkins House site produced data that undeniably confirmed its state of preservation. It contained historic subsurface features, containing chronological and subsistence data demonstrating sound associations. It appears to meet criterion "d" of the National Register criteria.

Five prehistoric sites, 15CB15, 15CB41, 46CB92, 46CB98 and 46CB100, and one historic site , 46CB103, have been recommended for further work to assess their eligibility for inclusion in the National Register. In the case of 46CB41, this recommendation pertains to the prehistoric component only; and in the case of 46CB100, it is relevant to both the prehistoric and historic components. The prehistoric sites may contain data on settlement patterning, burial practices, chronology, subsistence, and material culture. Site 46CB103 is being recommended due to the dense concentration of early-mid nineteenth century historic material recovered in association with heavy concentration of brick fragments. The relationship between 46CB103 and the Jenkins estate remains unclear at this time. The balance of the sites investigated appeared to represent little more than shallow, plowzone surface scatter and no further work is recommended.

CHAPTER I. INTRODUCTION

Pursuant to Section 2(a) of Executive Order 11593, "Protection and Enhancement of the Cultural Environment," and Section 110(a)(2) of the National Historic Preservation Act of 1966, as amended, federal agencies are required to identify, evaluate and nominate to the National Register of Historic Places all eligible archaeological and historic properties that are located on lands under that agency's control or jurisdiction. Section 2(b) of Executive Order 11593 and Sections 106 and 110 of the National Historic Preservation Act (16 U.S.C. Sec. 470f, as amended, 90 stat. 1320) further require that federal agencies provide both short-and long-term planning that is adequate to ensure that all eligible cultural resources are properly managed. Such properties must be afforded an appropriate level of consideration in advance of undertakings which may affect these resources either directly or indirectly. Consistent with these requirements, the Huntington District Corps of Engineers issued Work Order No. 0015, under Contract No. DACW-87-D-0034. The purpose of this Work Order was to complete a phase one archaeological assessment of the Gallipolis Mitigation Site (also referred to in this report as "Greenbottom" for historical reasons), Cabell County, West Virginia (Figure 1). Approximately 900 acres in size, this tract of land contained well-established wetlands. These wetlands were purchased by the Corps, and will be managed by the West Virginia Department of Natural Resources, as a mitigation measure for the destruction of wetlands associated with the Gallipolis Locks and Dam Replacement Project in Mason County, West Virginia.

The present field study was completed between 15 October and 2 November 1989. A total of 836 acre were subject to an intensive, inventory-level, archeological survey; as a result, a total of 18 sites were investigated. Of these, three sites had been recorded previously (46CB15, 46CB40, and 46CB41) and fifteen new sites were recorded. Of the fifteen new sites, eight were prehistoric, four were historic and three sites had both historic and prehistoric components. In addition, a phase II National Register evaluation was conducted for the historic component at 46CB41, the Jenkins Home site.

For the purposes of this investigation a site was defined as "...any location where human behavior has resulted in the deposition of at least two different artifacts in close proximity, or other evidence of purposive behavior" (Tainter 1980:9). This definition places an emphasis on archeological manifestations which reflect intentional (and hopefully patterned) behavior rather than on accidental or idiosyncratic behavior. Moreover, the definition implicitly recognizes the importance of small sites which, as Chartkoff and Chartkoff (1980:15-16) point out, frequently reflect unique behavioral sets not duplicated in larger sites. Cultural deposits meeting this definition but less than 50 years of age were not considered to be sites as per the guidance provided in the Secretary of the Interior's "Standards and Guidelines for Archeology and Historic Preservation" (Federal Register September 29, 1983). All artifacts, field notes, photographs, negatives and attendant data generated by this investigation have been curated with the Blennerhasset Historical Commission in Parkersburg, West Virginia.

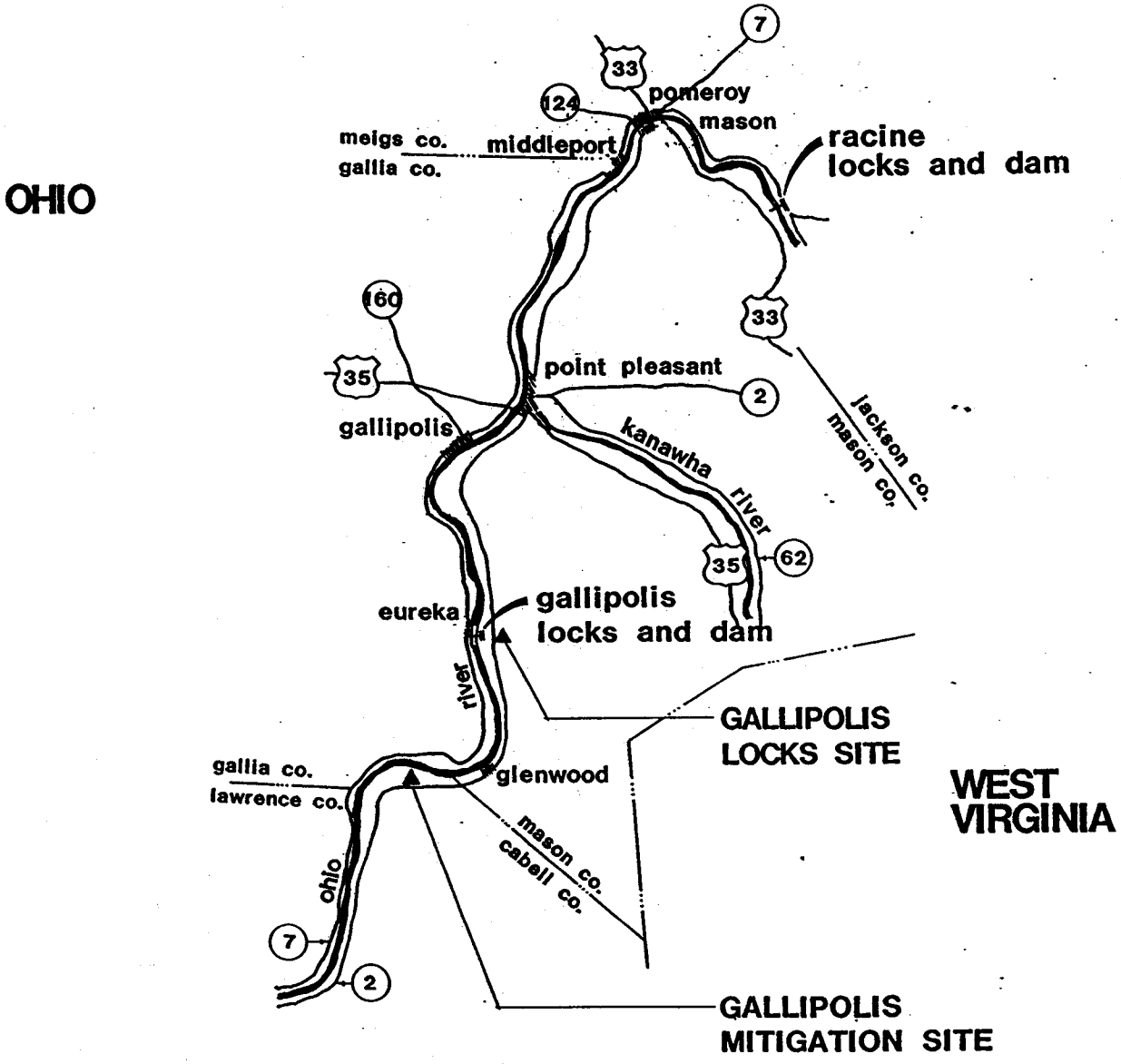

Figure 1. Locational map of the study area. Adapted from the U.S. Army Corps of Engineers (1988: Exhibit 11).

CHAPTER II. ENVIRONMENTAL SETTING

Introduction

As is the case with most large-scale government undertakings, there is a large body of data pertinent to the environmental characteristics of the Gallipolis Mitigation Site. Much of the following chapter has been taken from the U.S. Army Corps of Engineers environmental impact statement and related documents (1986, 1988).

The Gallipolis Mitigation Site is located sixteen miles north of Huntington, West Virginia between Route 2 and the Ohio River (refer to Figure 1). It is situated in northern in Cabell County, between river miles 286.7 and 290.1 in the Greenup navigation pool. The project area includes approximately 900 total acres, of which 126 acres are considered high-quality wetlands. The elevation varies from 515 to 558 feet A.M.S.L. Located in the Appalachian Plateau Physiographic Province, the bedrock geology of this area is dominated by Pennsylvanian-age sandstones and shales that belong to the Upper Conemaugh and Monongahela Groups.

Topographically the majority of the study area is flat to gently sloping. Steep slopes occur along the banks of the Ohio River and Guyan Creek. The portion of the study area which lies south of Route 2 and borders Guyan Creek is narrow, flat to gently sloping, bottom land while the bordering hillsides are steeply sloping.

Soils

The soils of the study area include thirteen different silt loam to silty clay loam series of the Ashton, Wheeling, Lakin, Muskingum, Upshur, Vandalia, Tilsit, and Wharton associations. The following discussion provides a brief description of each of the relevant soil series (U.S. Army Corps of Engineers 1988).

The Ashton Series consists of nearly level to gently sloping, well drained soils on high flood plains along the Ohio River. Textures range from dark brown silt loam to dark brown heavy silt loam. The soil is moderately acid to neutral. Depth to bedrock is greater than 60 inches. 0-3% and 3-8% slope.

The Chagrin-Melville Complex consist of nearly level, well-drained and poorly drained soils on low flood plain tributaries along the Ohio River. These soils occur in such an intricate pattern that they are not separated in mapping. Depth to bedrock is greater than 60 inches.

The Chagrin Series consists of very deep, nearly level, well-drained soils on low flood plains along Guyan Creek. Texture ranges from dark brown silt loam to brown sandy loam. Depth to

bedrock is greater than 65 inches.

The Gilpin-Upshur-Rock Outcrop Complex consist of very steep, well-drained soils on hillsides. These soils have a massive rock outcrop that is continuous and have 1 to 3 percent of their surface covered with stones that are 1 to 2 feet across. 35-65% slope.

The Huntington Series consist of deep, nearly level, well drained, soils located on flood plains of the Ohio River. Typically dark grayish brown to dark yellowish brown silt loam to a depth of 60 inches or more. The soil is moderately acid to neutral.

The Kanawha Series consist of very deep, nearly level, well-drained soils on high flood plains along Guyan Creek. Texture ranges from dark brown loam to yellowish brown clay loam. Depth to bedrock is greater than 65 inches. 0-3% slope.

The Lindside Series consist of deep, nearly level, moderately well-drained soils on the flood plains along the Ohio River. Typically dark brown silt loam to brown silty clay loam to a depth of 60 inches or more. The surface layer and upper part of the subsoil is moderately to strongly acid.

The Udorthents Unit consist of nearly level to very steep, mixed soil material and rock fragments from areas that have been disturbed by excavation, fills, and grading. It is scattered throughout the area but is predominantly along Route 2, railroads, and the Ohio River. Texture ranges from silty clay loam, clay loam, or sandy loam to dark red shaley clay. Rock fragments vary in kind, size and amount. In some areas bedrock has been exposed by excavation.

The Melvin Series consist of nearly level, poorly drained soils on flood plains of the Ohio River. Texture ranges from dark brown silt loam in the surface layers to grayish brown silty clay loam in the subsurface layers. The soil acidity is moderate to neutral. Depth to bedrock is greater than 60 inches.

The Markland Series consist of deep, moderately well drained soils, developed from alkaline slack-water materials on terraces, deposited by glacier-blocked streams. They occur in small areas along side streams. Texture ranges from grayish-brown silt loam to olive-brown silty clay loam. 6-12% slope.

The Muskingum-Upshur Complex consist of soils occurring on sloping to steep and very steep slopes. These soils occur on rocks of the Monongahala geologic series and to a small extent on the Dunkard geologic series. These geologic series are characterized by alternating strata of sandstone and red clay shale. Since the sandstone is more resistant than the shale, benches are formed. The sandstone ledges and loose stones make these soils stony. In

most places the rocks are shallow. Most of the acreage is in woodland, and much of it has never been cleared. 40-55% slope.

The Sensabaugh Series consist of gently sloping, well drained soils located on high flood plains and on alluvial fans at the mouth of hollows. The texture varies from a dark yellowish brown loam in the surface layers to a brown gravely loam subsoil. The soil is moderately acid to mildly alkaline. The depth to bedrock is greater than 60 inches. 3-8% slope.

The Vandalia Series consist of moderately steep and well drained soils located on foot slopes, along drainageways, and in coves. Texture varies from a dark brown silt loam in the surface layer to a reddish brown gravelly silty clay loam in the substratum. This soil is strongly acid. Depth to bedrock is greater than 60 inches. 15-25% slope.

The Wheeling Series consist of deep and well drained soils developed on terraces from glacial outwash material carried by the Ohio River. Texture ranges from a sandy loam to silty clay loam. 3-8% and 8-15% slopes.

Vegetation

The Gallipolis Mitigation Site lies within the Low Hills belt of the Cumberland and Allegheny Plateaus section of the Mixed Mesophytic Forest Region of the Eastern Deciduous Forest. The forest associations found in this region are the oldest and most complex of the deciduous forests. Mesophytic refers to a climax community where dominance is shared by several species.

The vegetation of the forested uplands include beech, red maple, sugar maple, back maple, yellow buckeye, red oak, white oak, basswood, yellow poplar, American elm, black locust, bitternut hickory, and shagbark hickory. Lower canopy species include sassafras, dogwood, hornbeam, redbud, sourwood, fraser's magnolia, and serviceberry. Common species of shrubs and herbs in the upland areas include witch-hazel, spicebush, pawpaw, alternated leaved dogwood, black haw viburnum, black elderberry, wild grape, and greenbrier (U.S. Army Corps of Engineers 1988:9-24).

Bottomland forest species in the study area include wild black cherry, slippery elm, black locust, silver maple, box elder, hackberry, bitternut hickory, black walnut, American elm, river birch, cottonwood, and black willow. Shrub species include spicebush, privet, alder, elderberry, raspberry, red-osier dogwood, and buttonbush. Herbacious species include nettle, touch-me-not, meadow garlic, white fawn lily, Virginia mallow, yellow ironweed, meadow rue, and honewort. Vines include Japanese honeysuckle, poison ivy, catbrier, Virginia creeper, and trumpetcreeper (U.S. Army Corps of Engineers 1988:9-25).

Four different types of wetlands have been identified in the Gallipolis Mitigation Site. Seasonally flooded basins or flats have varying vegetation which includes bottomland hardwoods as well as herbaceous growth. Inland open

fresh water wetlands are commonly bordered by vegetation such as pondweeds, naiads, wild celery, coontail, water milfoils, musk grasses, waterlilies, and spatter-docks. The vegetation of shrub swamp wetlands include alders, willows, buttonbush, dogwoods, and swamp-privet. The vegetation of wooded swamps include tamarack, arborvitae, black spruce, balsam, red maple, and black ash in the north, and water oak, overcup oak, tupelo gum, swamp black gum, and cypress are dominant in the south. Duckweeds, smartweeds, and other herbacious vegetation are frequently found in deciduous swamps (U.S. Army Corps of Engineers 1988:9-25 to 9-27).

The modern flora of the study area included species of economic importance to human populations. Most obvious of these are nut-bearing trees such as pin oak, shagbark hickory, black walnut, and bitternut hickory and those herbaceous species that bear fruit such as hackberry, elderberry and raspberry. Of less obvious economic importance were species such as the silver maple. The sap of this tree was used as a flavoring and as a syrup while the bark was pounded for bread (Steyermark 1963:1013; Yarnell 1964:49; Zawacki and Hausfater 1969:167). The roots and bark of the black willow were used both as medicine and as a source of fiber for the manufacture of bags, fish nets, and general purpose cordage (Steyermark 1963:494; Yarnell 1964:187).

Climate

The U. S. Army Corps of Engineers (1988:2-01) report that the current climate of the project area may be classified as temperate humid continental and produces an even distribution of rainfall (43 inches average annual precipitation). As a result of cyclonic disturbances which move through the Ohio River Basin in the winter and early spring, the watershed upstream from the project area is often prone to untypically high rainfall during the months of January, February, March, and April. Major floods occur most often during these months. Dense fog is common during the spring and fall and, some areas experience an average of 50 days a year of heavy fog. There are an average 181 days in the growing season which lasts from around April 20 to October 18 (U. S. Army Corps of Engineers 1988:2-04).

The environment of the middle Ohio Valley has changed dramatically over time. Climatic conditions during the Holocene age represent a series of transitions in temperature, rainfall and seasonal patterns. These transitions created a seemingly infinite range of ecological variation across time and space. This variation both limited and expanded survival strategies of human populations.

The following summary of late Pleistocene and Holocene environmental change is adapted from Niquette and Donham (1985:6-8) and has been extrapolated from paleoenvironmental research conducted by a number of scientists who have worked throughout the eastern United States.

The beginning of the Holocene Age, dated between 11,300 and 12,700 B.P., is associated with major and fairly rapid warming temperatures, decreases in cloud cover and generalized landscape instability (Delcourt 1979:270; Webb and Bryson 1972:107). Estimated temperature increases during this period are three times greater than later Holocene fluctuations (Webb and Bryson

1972:107). During the early Holocene, rapid increases in boreal plant species occurred on the Allegheny Plateau, in response to the retreat of the Laurentide ice sheet from the continental United States (Maxwell and Davis 1972:517-519; Whitehead 1973:624). At lower elevations, deciduous species were returning after having migrated to southern Mississippi Valley refugia during the Wisconsin advances (Delcourt and Delcourt 1981:147). The climate during the early Holocene was considerably cooler than modern climate and extant species in upper altitude zones of the Allegheny Plateau reflect conditions most similar to the Canadian boreal forest region (Maxwell and Davis 1972:515-516). Conditions at lower elevations were less severe and favored the transition from boreal to mixed mesophytic species. Paleo-Indian sites in the eastern United States are generally associated with the Early Holocene or Pleistocene-Holocene interface; Late Pleistocene sites are also known.

Middle Holocene (8000 - 4000 B.P.) climate conditions appear to have been consistently dryer and warmer than 20th century conditions (Delcourt 1979:271; Wright 1968). The influx of westerly winds during this Hypsithermal climatic episode contributed to periods of severe moisture stress in the Prairie Peninsula and to an eastward advance of prairie vegetation (Wright 1968). Delcourt has identified Middle Holocene moisture stress along the Cumberland Plateau in Tennessee, but indicates that upland barrens did not expand appreciably as did the midwestern prairies (Delcourt 1979:274). Changes in Archaic settlement patterns in both central and northern Missouri have been associated with possible decreases in upland resource availability during the episode (Joyer and Roper 1980; Warren 1982:349-350).

The earliest distinguishable Late Holocene climatic episode began circa 4000 - 5000 B.P. and ended around 2800 B.P. This episode is associated with the establishment of essentially modern deciduous forest communities in the southern highlands and increased precipitation across most of the mid-continental United States (Delcourt 1979:270; Maxwell and Davis 1972:517-519; Warren and O'Brien 1982:73). Beginning around 2800 B.P., generally warm conditions, probably similar to the 20th century, prevailed until the onset of the Neo-Boreal episode around 700 B.P. Fluctuations in this Late Holocene Pacific episode appear to have varied locally, with either increased or decreased temperatures and precipitation (Baerris, Bryson and Kutzbach 1976:50-52; Warren and O'Brien 1982:73). Certain of these fluctuations have been associated with adaptive shifts in midwestern prehistoric subsistence and settlement systems. An example is Struever and Vickery's (1973) suggestion of a possible correlation between the onset of a cooler, moister period circa 1600 B.P. and increased use of polygonum by Late Woodland groups in the Midwest (Struever and Vickery 1973:1215-1216). During this same period (1600-1300 B.P.) warmer temperatures have been inferred for the Great Plains and dryer conditions for the Upper Great Lakes (Baerreis et al. 1976; Warren and O'Brien 1982). Other fluctuations during the Pacific episode are similarly non-uniform across the midcontinental United States; however, the interfaces of all fluctuations are generally consistent. Local paleoecological evidence is required in order to determine the kinds of climatic fluctuations Woodland populations experienced during the Pacific episode. Given evidence of fluctuations elsewhere, it is most likely that changes occurred circa

1700 B.P., 1300 B.P., and 900 B.P., with a possible fourth change around 2300 B.P.

Recent studies of historic weather patterns and tree ring data by Fritts, Lofgren, and Gordon (1979) have indicated that 20th century climatological averages are "unusually mild" when compared with 17th - 19th century trends (Fritts et al. 1979:18). Their study suggests that winters were generally colder, weather anomalies were more common and unusually severe winters were more frequent between 1602 and 1899 than after 1900. These cooler, moister conditions are associated with the Neo-Boreal episode, or Little Ice Age, which began around 700 B.P. and coincided with minor glacial advances in the northwest and Europe (Denton and Karlan 1973; Warren and O'Brien 1982:73). This episode is viewed by Warren and O'Brien as a causal factor in vegetation pattern shifts in northeast Missouri (Warren and O'Brien 1982:74-76).

The effects of the Neo-Boreal episode, which ended during the mid to late nineteenth century, have not been studied in detail for the Appalachian Plateau region. It appears that the southeastern highlands experienced less radical temperature decreases during the late Neo-Boreal than did the upper Midwest and northern Plains (Fritts et al. 1979). Related changes in extant vegetation should therefore be more difficult to detect in the southeastern highlands. It is probably safe to assume, however, that average temperatures were at least a few degrees cooler during the late Prehistoric and early Historic periods. The frequency of severe winters and average winter precipitation were probably greater as well.

Fauna

Just as the environment, and therefore floral communities, has changed over time, so have the animal species which have inhabited the region. Extinct Pleistocene species may have included giant beaver, stag moose, mammoth, mastodon, horse, giant ground sloth, and dire wolf (Funkhouser 1925; Jillson 1968). With the retreat of the last great glacial advance, these animals were replaced by modern species such as turkey, passenger pigeons, Carolina parakeets, grizzly bears, caribou, wolves and buffalo (Barbour and Davis 1974). Today, the area is inhabited by waterfowl, rabbit, gray squirrel, fox squirrel, raccoon, opossum, skunk, red fox, gray fox, mink, muskrat and deer. For a more comprehensive list of mammals, amphibians, reptiles, birds, and fish that presently inhabit the project area vicinity, the reader is directed to U.S. Army Corps of Engineers (1988:Appendix II).

CHAPTER III. PREVIOUS RESEARCH AND CULTURAL OVERVIEW

Previous Research

Prior to the current study,. there were four recorded archeological sites known to be located in the study area. These included Clover (46CB40), 46CB41, 46CB15 and the Guyan Creek site (46MS93).

The Clover Site (46CB40) was recognized as early as the 1920's. A variety of surface investigations by Adams (1960), Adams and Durrett (1952), Griffin (1943) and Mayer-Oakes (1955) produced photographs of artifacts and indirect reference to the site (Freiden 1987). Excavations, as reported by Griffin (1943:244), produced one extended inhumation of a seven-year old child. The grave yielded burial goods such as a clay animal effigy, cut mussel shell disc and pendants, and Marginella shell beads. Wilkins (1974) completed a surface survey of Clover, but no excavations were undertaken at that time.

The Marshall University Archaeological Field School, under the direction of Nicholas Freidin, completed a series of studies at Clover between 1984 and 1987. Aerial photographs of the site were initially examined and the site was subsequently mapped with a plane-table and alidade. The topographic map displayed a slightly elevated semi-circular pattern thought to correspond with a midden circle, a common pattern for Fort Ancient villages. Following this procedure a resistivity survey was completed on a small part of the site in order to support the previous findings. The results of this effort displayed that areas of low resistivity corresponded with the outline of the midden obtained from the previous investigations. Finally, a series of one and two square meter test units were excavated at the site. The test pits revealed that the circular midden surrounding the village area was from 30 to 40 cm in thickness and that, although the village exhibited debris build-up, the midden circle was much more substantial in cultural and subsistence remains. Subsurface remains discovered at the site included six burials, post molds, a hearth and one feature of indeterminate function. Freidin (1987) supported earlier chronological assertions made by Griffin and Mayer-Oakes and reported that the main occupation at Clover occurred "...in the middle-to-late Sixteenth Century A.D."

Site 46CB41 was recorded and described by Gary Wilkins (1974) of the West Virginia Geological and Economic Survey. He conducted a survey of the Greenbottom area in advance of the expansion of West Virginia State Route 2. One test unit 5 X 10 square ft in size was placed within the original boundaries of the site and was excavated to a depth of 1.5 ft. The density of the cultural materials in the unit was low and subsurface features were not observed.

Wilkins (1974) also recorded the Guyan Creek site (46MS93) as part of the same highway project. He indicated that the site had been impacted by construction activities associated with the existing Route 2, the adjacent rail-

road tracks, and a secondary road leading to the bluffs to the east. He excavated four 3 feet by 5 feet test units and two 5 feet by 10 feet units. Wilkins' total yield from these six units was limited to five flakes.

Finally, 46CB15 was recorded by Tom Kuhn, who at the time was working for the Huntington District Corps of Engineers. He had been apprised of the site's location by local artifact collectors. No published report exists for the site but the site form indicates that Kuhn thought that the site represented one or more Fort Ancient occupations based upon his recovery of about two dozen triangular points. Robert F. Maslowski (personal communication 1989) has suggested that Kuhn may not have collected these points, but rather observed the artifacts in collections made by others.

Cultural Overview

Early Man (?) There is general agreement that man arrived in North America via the land bridge that once joined Siberia and Alaska, where they are now separated by the Bering Strait (Dragoo 1976:4). These earliest Americans probably followed the Pleistocene megafauna to this continent, thereafter populating both North and South America. Muller-Beck (1966) notes that this may have occurred as early as 40,000 B.C. There is growing evidence to support this view, and perhaps an even earlier date of man's arrival to this continent. We do not even know if there existed on the North American continent a pre-projectile point or "pebble tool" horizon similar to that which has been documented for the Old World (Jennings 1978:2-20); however, if it did, it necessarily existed prior to 10,500 B.C.

For example, at Meadowcroft Rockshelter in western Pennsylvania dates exceeding 17,000 B.C. have been assayed from the material recovered from the deepest microstrata in Stratum IIa (Adovasio et al. 1978:638-639). Additional but controversial evidence of a pre-projectile point horizon has been found in the Lively Complex in Alabama (Lively 1965), the Debert Site in Nova Scotia (MacDonald 1968), and at Wells Creek Site in Tennessee (Dragoo 1973). Despite this evidence, Early Man's existence on the North American continent remains open to question because pebble tool artifacts (e.g., choppers, scrapers and planes) persisted into Paleo-Indian and later periods.

The Paleo-Indian Period (10,500 - 8,000 B.C.). The earliest cultural period conclusively documented in the middle Ohio Valley is Paleo-Indian. Dragoo (1976:5) has dated this period in the eastern United States from about 10,500 B.C. to 8,000 B.C. However, Mason (1962:236) has suggested that this period may have begun as early as 13,500 B.P. (11,550 B.C.), based on what is known about North American glacial history at the close of the Pleistocene.

Man's arrival in the middle Ohio Valley was closely associated with the movements of the Pleistocene glaciers. During the Paleo-Indian period, the last of these glacial advances and retreats, called Valders, occurred. Although the glaciers never actually extended south of the Ohio River, the climatic effects of the glacier were probably felt. A cooler, moister climate affected the composition and distribution of floral and faunal communities (Delcourt and Delcourt 1982), although the specific effect in West Virginia

is not well understood.

Distinctive lanceolate-shaped, often fluted, projectile points called Clovis are the artifactual hallmarks of the early part of the Paleo-Indian period. Unifacially and bifacially chipped tools such as knives, scrapers, and spokeshaves, endscrapers with spurs, drills and gravers have also been recovered. Artifacts and tools of wood, bone and shell are inferred to have also been used, but poor preservation of these artifact types have prevented recovery.

In the Plains area, Paleo-Indian points recovered from subsurface contexts have been found in direct association with extinct Pleistocene megafauna (Jennings 1978:27). Often these sites have been interpreted as kill sites. This has led archeologists to hypothesize that these early Americans were engaged full-time in hunting big-game Pleistocene mammals, such as mammoth, mastodon, giant beaver, bison and Pleistocene horse, to the exclusion of plant resource utilization.

In the eastern United States, fluted points have not been recovered in association with extinct Pleistocene fauna. Quimby (1960:27-33) thinks that even without this association, archeologists may still postulate that Paleo-Indian peoples were hunting mastodons in the Upper Great Lakes. MacDonald (1968), on the other hand, has proposed that perhaps caribou were the preferred game. Evidence to support this suggestion has been found at Holcomb Beach in Michigan (Fitting et al. 1966), where caribou remains were found in a hearth associated with Paleo-Indian fluted points.

The traditional picture of Paleo-Indian lifeways consisting of big-game hunting almost exclusively is currently viewed as too simplistic. For example, floral and faunal materials recovered from the Shawnee Minisink Site in Monroe County, Pennsylvania, reflected a much different picture. Dent (1981:79) reported that the Paleo-Indian levels of this site included carbonized seeds such as acalypha, blackberry, chenopod, hawthorn plum, hackberry and grape. In addition, the faunal assemblage suggested that these people were heavily dependent upon fish.

Although Paleo-Indian type sites are located in the western Plains area, more fluted points have been found in the Midwest and Southeast than in the Plains (Jennings 1978:27). Early Paleo-Indian Clovis points occur abundantly below the glacial margin around the Ohio River, and are particularly common in Kentucky, Tennessee, Alabama and Georgia (Dragoo 1976:9).

Paleo-Indian sites in the eastern United States where Clovis points have been recovered from subsurface contexts include Bull Brook in Massachusetts (Byers 1954), Shawnee-Minisink Site in Pennsylvania (Marshall 1978), Wells Creek Site in Tennessee (Dragoo 1973), Debert Site in Nova Scotia (MacDonald 1968), and Modoc Rockshelter in Illinois (Fowler 1959). At Meadowcroft, despite the lack of diagnostic fluted projectile points, subsurface remains which date to the Paleo-Indian period were recovered. These include Mungai knives, bifaces, flake blades, and debitage, as well as four firepit features (Adovasio et al. 1977). The earliest positively dated Paleo-Indian component in North America (14,225 +/-975 B.C.) (SI-2354) was recovered from Stratum II at this site.

Fluted points recovered from subsurface contexts in West Virginia are exceptionally rare. Instead, these artifacts tend to be found on the surfaces of multicomponent sites. Two distributional patterns of Paleo-Indian points have been noted in West Virginia. Broyles (1969) and Wilkins (1978) both reported numerous Paleo-Indian points in upland and ridgetop contexts, a pattern that appears to be widespread throughout the Ohio Valley. Baker and Fowler (1975) and others (Adams 1960; Little 1960; Frank 1971; Hyde 1960;Youse 1981, 1982) have also reported a distribution of these artifacts on the floodplains of the state's major rivers.

With the retreat of the glaciers, the environment began to change, and the Pleistocene megafauna became extinct. Regional archeological complexes began to develop (Dragoo 1976:10) as new projectile points replaced the Clovis point tradition. This change occurred as a result of human adaptations to the changing environment. In the Southeast, Clovis fluted points gave way to Cumberland, Quad, Dalton (Meserve) and Hardaway-Dalton projectile points. These last two points are representative of the transition from the late Paleo-Indian to the Early Archaic period.

The Archaic Period (8000 B.C.-1000 B.C.). The Archaic period includes a long span of time during which important cultural changes took place. It is generally agreed that Archaic cultures evolved from late Paleo-Indian expressions of the Southeast and Midwest, since there is growing evidence for the existence of transitional cultural manifestations (Funk 1978:19). These manifestations probably occurred in response to environmental changes which took place at the close of the Pleistocene.

The Archaic is customarily divided into three sub-periods: Early (8,000-6,000 B.C.), Middle (6,000-3,500 B.C.), and Late (3,500-1,000 B.C.). During the Early Archaic, the last glaciers retreated, and the arctic-like boreal forest began developing into the eastern deciduous forest. By the Middle Archaic, the environment was much as it is today. In response to the changing environment, with its associated changes in plant and animal life, Late Archaic peoples developed a more diversified subsistence strategy based on local choices from a variety of subsistence options, that included hunting, plant food gathering, fishing, and, in some areas, the beginnings of plant domestication in a planned seasonal round exploitation strategy. Caldwell (1958:6-18) has called this Archaic subsistence approach "primary forest efficiency". This strategy appears to have continued well into the Woodland period.

Except for the adoption of new projectile point styles, such as Kirk, LeCroy, St. Albans, Palmer, and Charleston, Early Archaic tool kits are nearly identical to those associated with the Paleo-Indian period. The fact that these projectile point styles are found over a very large area suggests that little regional subsistence diversity occurred during the Early Archaic. Rather, subsistence strategies are believed to have been similar to those employed by Paleo-Indian peoples, although a greater variety of game was hunted. The scarcity of tools associated with the preparation of plant foods and fishing in the early part of the Archaic indicates that hunting was probably still the major subsistence activity (Dragoo 1976:11). Archeological investigations at a number of deeply buried sites in the Southeast have served to outline cultural developments that occurred during the Archaic: the St.

Albans Site in West Virginia (Broyles 1971), the Longworth-Gick Site near Louisville, Kentucky (Collins 1979), three sites in the North Carolina Piedmont (Coe 1964) and Modoc Rockshelter in Illinois (Fowler 1959).

According to data obtained from Dixon and Rohr (Mayer-Oakes 1955; Dragoo 1958), Early Archaic peoples inhabited rockshelters, which were apparently used as short-term, temporary camps, as well as the large riverine base camps mentioned above. Durrett (1952) reported heavy concentrations of Early Archaic materials at 46Cb10, near the confluence of the Guyandot and Ohio Rivers. The majority of Early Archaic points from this site and from Early Archaic sites along the Teays and Kanawha Rivers were made from Kanawha chert (Corps of Engineers 1980).

The environment during the Middle Archaic sub-period was dryer and warmer than modern conditions. Increasing regionalization of artifact inventories and the addition of new artifact classes and projectile point styles imply the development of extensive exploitation strategies. The Middle Archaic is marked by the introduction of groundstone artifacts manufactured through pecking, grinding, and polishing: adzes, axes, bannerstones, and pendants. A number of these groundstone tools such as manos, mortars and pestles, and nutting stones interpreted as plant food processing artifacts, indicate an increasing utilization of plant food resources during the Middle Archaic.

Greater regionalization is also noted in new projectile point styles during this sub-period: stemmed and corner notched points such as MacCorkle, Morrow Mountain, Stanley, and Big Sandy II appear. A variety of bone tools including antler projectile points, fish hooks and gouges suggest an improved efficiency in exploiting local resources. Middle Archaic sites tend to contain larger accumulations of materials than those of earlier periods, suggesting an increased group size and/or longer periods of occupation (Cohen 1977:191). Important sites in the Southeast with Middle Archaic components include sites in the Little Tennessee such as Icehouse Bottom (Chapman 1977), Eva in west Tennessee (Lewis and Lewis 1961), North Carolina Piedmont sites (Coe 1964), and Modoc Rockshelter (Fowler 1959).

Chapman (1975) has suggested that Archaic projectile points were probably used in conjunction with the atlatl, a device which increases the distance and accuracy of a thrown spear. The recovery of bone and groundstone objects (bannerstones) in Middle Archaic contexts interpreted as atlatl weights tends to support Chapman's suggestion (cf., Neuman 1967:36-53). Certain classes of chipped stone tool artifacts such as scrapers, unifaces, drills, and gouges, indicate a continuation of their importance from the Paleo-Indian period.

In the middle Ohio Valley there appear to be at least two Middle Archaic horizons, although the second is not particularly well-documented. The first is the North Carolina sequence (Coe 1964) which was confirmed by Broyles (1971) at St. Albans. The second Middle Archaic manifestation is represented by corner notched and side notched Brewerton and Lamoka-like points. These are typically thought of as Late Archaic point styles but they may well have first appeared during the Middle Archaic (Hemmings 1977, 1985; Wilkins 1978; Corps of Engineers 1980).

The Late Archaic was a time of continued cultural expansion and complexity

which grew out of the previous periods. Dragoo (1976:12-15) has discussed several Late Archaic traditions for the Eastern Woodlands. Their distinctiveness stems from varied responses to each regional environment reflected in their material culture. Straight-stemmed, basal-notched or contracted-base projectile points types characterize this subperiod: Brewerton, Hansford, Buffalo Stemmed and McWhinney. The remains of steatite vessels in Late Archaic contexts are the precursors of the ceramic vessels which appear during the Woodland period. Judging from the greater number of sites which have been noted for the Late Archaic, an increase in population can be postulated. Evidence of longer and more intensive site occupation suggests in some cases extended habitation within an area.

Archeologists have inferred from ethnographic analogy drawn from surviving hunter-gatherer groups in remote areas of the world that Late Archaic groups were probably organized in nomadic or semi-sedentary bands, with scheduled seasonal movements in response to the available faunal and floral resources. Late Archaic settlement generally reflects a series of camps located to take advantage of seasonal environmental resources. Artifact inventories for the Late Archaic reflect these diversified responses to a wide variety of environmental conditions.

In areas of southern and eastern West Virginia (McMichael 1968), southwestern Virginia (Holland 1970), and in southeastern Kentucky (Dunnell 1972), archeologists have documented the shift during the Archaic from the use of chert for the manufacture of projectile points in the Early Archaic to a preference for materials such as quartzite, silicified shale, and ferruginous sandstones during the Late Archaic. It is important to note that chert was not ignored as a raw material for lithic tool manufacture during this time, but that these other materials were added to the raw material inventories. At present, it is unclear whether the use of materials other than chert to manufacture projectile points was the result of some groups having limited or no access to chert resources, or a cultural preference for non-chert materials (Ison and Pollack 1982). During the Woodland period, chert was again the favored chipped stone resource.

The population increase and an inferred increase in mortuary ceremonialism have led some investigators to postulate that a more complex social organization was developing in some areas of the eastern United States. Along the Green River in west-central Kentucky, large shell mound sites such as Chiggerville (Webb and Haag 1939), Indian Knoll (Webb 1946), and Carlson Annis (Webb 1950) contain hundreds of human burials illustrative of complex mortuary practices and a rich ceremonial life. The development of inter-regional trading networks is indicated by the recovery of copper, marine shell and other non-local artifacts from Late Archaic burials (Winters 1968). These foreign materials testify to the growing complexity of the ritualism connected with the burial of the dead, but also to the interaction of many groups which would have facilitated the exchange of not only goods but also ideas (Dragoo 1976:17).

The appearance of cultigens in Late Archaic contexts has been interpreted as evidence of early plant domestication and use of these plants as subsistence resources. Evidence of early cultigens has been documented at such sites as Koster in central Illinois (Brown 1977:168), at the Carlson Annis and

Bowles sites along the Green River in west-central Kentucky (Marquardt and Watson 1976:17), and at Cloudsplitter Rockshelter in eastern Kentucky (Cowan et al. 1981).

Streuver and Vickery (1973) have defined two plant complexes domesticated at the close of the Archaic, which continued in use into the Woodland period. One group consisted of non-native plants such as gourd, squash and corn. The other was a group of native plants such as chenopodium, marsh elder and sunflower. Struever and Vickery (1973) suggested that the native cultigens were cultivated first, and that the non-native, tropical cultigens were introduced later. Recent research in Missouri, Kentucky and Tennessee, however, suggests that squash was under cultivation in the mid-south by the late 3rd millennium B.C. (Adovasio and Johnson 1981:74), and that by the second half of the 2nd millennium B.C., evidence from Illinois, Kentucky and Tennessee demonstrates that squash, gourd and sunflower were well established (Adovasio and Johnson 1981:74). This more recent evidence contradicts Streuver and Vickery's scenario (Chomko and Crawford 1978). According to the most recent research, (Watson n.d.) has outlined two different groups of cultigens, the East Mexican Agricultural Complex and the Eastern United States Agricultural Complex. The latter includes sunflower (Helianthus annus), sumpweed (Iva annua), chenopod (Chenopodium sp.), maygrass (Phalaris sp.), and knotweed (Polygonum sp.). The East Mexican Agricultural complex includes squash (Curcurbita pepo), bottle gourd (Legenaria siceraria) and maize (Zea mays. Watson, like Struever and Vickery (1973), suggests that corn, squash and bottle gourd were domesticated in Mexico and imported into the eastern United States by way of the Gulf of Mexico and then up the Mississippi River and its tributaries. The native cultigens consist of local species whose seeds recovered from archeological contexts are much larger than those which grow in a natural state; hence, cultivation is inferred.

Plant domestication was an important factor in Late Archaic cultural development. Recent research at Cloudsplitter Rockshelter has documented early plant domestication. Dessicated squash rind was found in a Late Archaic deposit at Cloudsplitter associated with a radiocarbon date of 3728 +/-80 B.P. (1778 +/-80 B.C.)(UCLA 2313-K)(Cowan et al. 1981:71). Seeds of the Eastern Agricultural complex (sunflower, sumpweed, maygrass and erect knotweed) are sparse in the Late Archaic levels in the site, but after 3000 B.P. (1050 B.C.), all members of the Eastern Agricultural complex underwent a sudden and dramatic increase in the rate at which they were being deposited in the site, perhaps indicative of a wholesale introduction of the complex into the region at this time. The Late Archaic and Early Woodland inhabitants of Cloudsplitter seem to have followed a similar trajectory in cultivated plant usage experienced in several other river drainages in the East (Cowan et al. 1981:71).

The data from Cloudsplitter Rockshelter suggest that squash may not have diffused into the East or Southwest from Mexico as previously postulated by Struever and Vickery (1973), but that it may have evolved in situ from North American stock (Cowan et al. 1981:71). This interpretation seems to be substantiated by more recent investigations conducted throughout southeastern and mid-western United States.

During the Archaic, cultures became more varied, as each group tailored its

own brand of subsistence strategy for maximum exploitation of locally available resources. Hunting, fishing, and plant food processing activities carried out in a seasonal round pattern of exploitation appears to characterize Late Archaic subsistence strategies in the Ohio Valley. This strategy appears to have continued into the Woodland period.

The Woodland Period (1000 B.C.- A.D. 1150). As discussed elsewhere (Niquette et al. 1988) the Woodland period in the Ohio Valley is one of the most difficult archaeological periods to conceptualize or interpret in the Eastern United States. While we increase our understanding as more data are collected, new contradictions in its conceptualization are revealed. The Woodland period is both a developmental period of cultural continuity from the preceding Archaic; and at the same time, it is a dramatic departure from the basic cultural traits of the Archaic. It is apparent that cultural change in the Ohio Valley was spasmodic and episodic. All regions of the Eastern United States did not march hand-in-hand through time towards increasing cultural and social complexity; neighboring regions changed at quite different rates. In the Middle Woodland period high levels of cultural and social elaboration, at least as expressed in earthworks and elaborate mortuary structures, were attained along the Scioto in Southern Ohio. Parallel developments occurred elsewhere only in scattered locations, if at all.

These peaks of cultural complexity were not followed by a continuing elaboration of society and culture. The end of the Woodland period in many ways marked a decline from heights attained 100-200 years earlier in many parts of the Ohio Valley. The Woodland period here and elsewhere, is the first point in prehistoric time that the archeologist encounters the truth of Caldwell's observation (1958), namely that cultural development in the Eastern Woodlands was not leading inexorably toward civilization. Rather, departing from an Archaic base, cultural evolution in the Eastern United States proceeded by fits and starts with local advances and backsliding.

The Woodland period is customarily divided into three sub-periods: Early, Middle, and Late. Their absolute chronology is open to question. For the purposes of this report, Early Woodland is dated between 1000 B.C. and 400 B.C., Middle Woodland between 400 B.C. and 400 A.D., and Late Woodland between 400 A.D. and 1100 A.D. To some extent these divisions represent departures from current uses and reflect shifting conceptions of the nature of culture development during the era as a whole.

Traditionally, Ohio Valley archeologists have set the beginning of Early Woodland at circa 1000 B.C., a convention chosen to express a belief that a ceramic technology began throughout the region at about that time. Despite this popular assumption, there are problems with this early dateline. The contexts for some early ceramic dates are quite ambiguous (cf., Rais-Swartz Shelter). Other dates, or their associations with early ceramics, are suspect. Finally, it is becoming clear that pottery may have been introduced over as much as 500 years in the Ohio Valley (Seeman 1986) reflecting its diffusion into the area from outside (possibly the Northeast) as opposed to its local invention.

The suggested temporal limits of the Middle Woodland are highly controver-

sial. They are selected not to be disputatious, but to side-step the classificatory problem of defining that which is Adena versus that which is Hopewell and to avoid the more vexing question of the relationship between the two. In their development which spans a period of nearly 90 years, the concepts of Adena and Hopewell reflect attempts by Ohio Valley prehistorians to provide order to the cultural traits observed largely from burial mounds and from these to create "cultural" entities. While there is a general recognition that the traits, regarded respectively as Adena or Hopewell, are sequentially distributed in time, analysis of cultural material from excavated contexts has not resulted in the recognition of separate and entirely comprehensible cultural entities. At the same time few would argue against the general proposition that Adena and Hopewell represent a Central Ohio Valley continuum in cultural development, as expressed in burial mounds and earthworks. The initial complexity of an "Adena culture" leads directly into the culminating convolution of a "Hopewellian culture."

Distributional studies have not revealed a neat chronological sequence between Adena and Hopewell. The arguments over whether a particular local sequence is more "Adena" than "Hopewell", or more influenced by one than another (cf., McMichael and Mairs 1969; Wilkins 1979), cease to be convincing when pushed to their logical extremes. The approach taken here is to include both manifestations in the same temporal unit and in so doing to emphasize the continuity from one to another. Within the sub-period, the degree to which these break down in time or space is another matter, and one which is addressed on a local basis depending upon the nature of the data. To establish a Middle Woodland sub-period between c. 400 B.C. and 400 A.D. does not deny Adena and Hopewell; it is an attempt to make them more relevant to each other than they have been in the past. Moreover, it serves to avoid a line of discussion which has become sterile over the years.

The weight of tradition hangs heavy on culture historical integration. Customarily, Adena has been considered "Early Woodland" and Hopewellian has been considered "Middle Woodland." If Early Woodland is to begin at c 1000 B.C. with the introduction of ceramics, then the beginning of the period clearly predates the Adena phenomenon (Seeman 1986). The beginning of Middle Woodland period as used here does not, however, sweep all of Adena into a Middle Woodland. In the central Ohio Valley between 1000 B.C. and 400 B.C. there exist steps in the development of the Adena/Hopewell continuum which are largely unknown today. Despite this, these steps may be glimpsed in mound sites like Willow Island in West Virginia, Hartman in Kentucky, and possibly Topefner in Ohio. Adena is the critical bridge between the simplicity of the Late Archaic and the complexity of the Middle Woodland period.

The Early Woodland sub-period is distinguished by what we do not know about it. In the Ohio Valley it is largely a worrisome data gap. Its temporal boundaries tend to change as we gather more data and as we develop an understanding of its culture historical relationship to the periods which precede and follow it. The decision to establish 400 B.C. as the end of the Early Woodland reflects a recognition of the close relationship between Adena and Hopewell. This appears justified since historically Early Woodland in the Ohio Valley was conceptualized as linking two trait developments: the occurrence of the first ceramics and the origins of the practice of constructing complicated mortuary structures.

We have known for some 30 years that these two trait developments were not synchronous, but it has been difficult to demonstrate it. The evidence is contradictory on a number of counts. Ceramics in the Eastern United States probably had multiple origins. One of these occurred in the deep South and another perhaps somewhere in the mid-Atlantic region, but both were present long before burial mounds made their appearance. At the same time we are far from secure in our understanding of how and where burial mounds did develop and the sequence of this development. Did the origins of mound building involve in-migration (cf., Webb and Snow 1945; Spaulding 1952) or perhaps an autochthonous development (cf. Dragoo 1963)? Both alternatives are open to criticism, and as a result the period has suffered from a lack of definition. This situation is exacerbated by the dearth of recorded sites in the Ohio drainage which date to the period between c. 1,000 B.C. and 500 B.C. Such sites are critical to the definition of much of the temporal unit.

The Middle Woodland has always been the substantive heart of "Woodland" as a whole. Because of their spectacular nature, for example in the Scioto Valley of southern Ohio, the sites of this time period have been used to a great extent to characterize the period and its development. Thus the problems of Middle Woodland development have become by extension and without substantial reason the problems of the Woodland period as a whole.

To a great extent our difficulties in understanding the developmental history of the Middle Woodland period is a reflection of the history of archeology in the Ohio Valley. The period is firmly grounded in the discovery of the Moundbuilders as subjects of professional interest in the early 19th Century (cf., Squier and Davis 1848, Atwater 1820). The archeology of the Middle Woodland period remains the archeology of the "Moundbuilders." Although no professional uses the term today, as late as 1941 Ford and Willey characterized this time period as Burial Mound I and II, long after Moundbuilders had ceased to be of professional interest (Ford and Willey 1941; Prufer et al. 1965:128).

Moundbuilder archeology is not particularly relevant to an understanding of either the Early or Late Woodland sub-periods, or even to the Middle Woodland in all parts of the Ohio Valley. The very archeological features which have so long been the conceptual centerpiece of Ohio Valley Woodland quite often appear as an aberrant development in time, begging now for an explanation and at the same time not very useful in explaining some of the most simple events before and after them in time. If a professional consensus has developed, it is that there is regional diversity in the Middle Woodland period, not the homogeneity as naively expressed in concepts such as "Moundbuilders", Burial Mound I and II, or even "Hopewellian" (Griffin 1979:278). It remains to translate this consensus for a reinterpretation of "Woodland" into interacting regional sequences based on adequate local data sets.

Woodland period economies exhibited a basic hunting and gathering structure which had an Archaic heritage. Deer was a staple at the beginning of the Woodland and remained one to the end, and nut crops were always important. Despite this a conceptualization of "Woodland" has generally included some level of plant manipulation. It has been assumed that the Woodland period was a period during which plant domestication took place and patterns of an agri-

cultural economy developed.

Woodland period agriculture, or at least horticulture, in the Ohio Valley was assumed by archeologists long before it could be documented by the recovery of cultigens found in archeological contexts. This assumption was predicated on a second belief that Middle Woodland peaks of cultural development, expressed in earthworks and elaborate mortuary ritual, required a surplus food economy and an agricultural economic base which alone could supply it (cf., Thomas 1894:614-620). The position, however, cannot be relegated entirely to the formative period of Eastern United States archeology. As late as 1958 it was functioning as an important integrating concept, although still largely on theoretical grounds (Willey and Phillips 1958:157-158).

Subsequently, our understanding of Woodland period subsistence has indicated that things were never that simple. This view has developed out of grappling with the question of corn and Middle Woodland archeology at a practical as opposed to a theoretical level. Our increased understanding of the role of corn in New World culture change, a product of work in Mexico, led archeologists in the 1960's to explore the relationship between the cultigens and Middle Woodland period archeology (cf., Prufer 1965:12).

Critical acceptance of this developing environmentalism has led to an increasingly sophisticated understanding of the relationship between subsistence and Woodland period cultural developments. Ohio Valley Woodland economic development is now known not to parallel any Middle American development. For this reason the term "formative", as applied in Middle America (Willey and Phillips 1958:151-170), has never been seriously used with reference to the Eastern United States.

A number of sites raise tantalizing prospects for linking the occurrence of corn with burial mound contexts. Examples include McGraw (Prufer et al. 1965), the Daines Mounds (Murphy 1975), the Turner Mound (Willoughby and Hooten 1922:29), the Edwin Harness Mound (Greber 1983), and the Kirk and Newman Mounds (Niquette et al. 1988). As a rule no site has provided convincing evidence that corn agriculture was intensively involved in Woodland agriculture. The odds are increasingly against the position developed by Prufer and his associates from their excavation of the McGraw Site (Prufer et al. 1965), that is that they have demonstrated the missing corn agriculture basis for Scioto Valley Hopewell. In at least some cases questions of association may be raised and the corn may indeed be of modern age, incorporated by recent agricultural activity in what appear to be prehistoric archeological contexts.

Of other excavated mounds in the Ohio Valley, the best that can be said is that if corn was present, it was not nutritionally important. This is also supported by the analysis of human skeletal populations from the Middle and Late Woodland which indicate that corn was not significant in the diet before the Late Woodland period (Bender, Baerreis, Steventon 1981). Lathrap (1987:348) reminds us, however, that corn may have been consumed green, in which case it might not be detected in bone structure .

Given the speed with which corn became important near the close of the Late Woodland, with the appearance of specific varieties around 900 A.D., it is

difficult to see a chance occurrence of the cultigen taking place prior to that time without leading to its widespread adoption at a much earlier date. In short, if corn entered the Ohio Valley prior to the Late Woodland one might assume that it would have made its presence felt. As in Middle America, corn would have functioned as a catalyst, emphasizing the advantages of horticulture/agriculture and leading to increasing its importance in Woodland economies. No such sequence of events took place in the Early or Middle Woodland periods. But it was obviously taking place in the Late Woodland period although in a manner quite different from Middle America.

These factors lead one to further question the archeological samples of corn which have been reported and which are advanced to support an agricultural base for the Woodland period in part or as a whole. Greber (1983:87) has suggested an alternative interpretation. Zea maize may have been a special purpose plant circa 300 A.D., and possibly earlier, in a sense like tobacco (Nicotinana rustica). This might explain scattered occurrences of the plant in ritual contexts such as she has defined them in the "Great House" which preceded construction of the Harness burial mound. Such an argument might offer an explanation for the exclusion of the plant from subsistence in general. When this is coupled with the hypothesis that Woodland period corn in the Eastern United States may have had lowland South American origins, thus limited both in its viability and ability to hybridize towards more adaptive varieties in the temperate Eastern United States (summarized in Lathrap 1987), a possibly reasonable explanation for the scattered occurrence of corn emerges.

In dealing with the Woodland, and still implicitly driven by the idea that the heights of cultural development during the era were founded in economic advances over the Archaic, archeologists have been forced to consider in detail other types of plant domestication which may have occurred and have had effects similar to corn agriculture through the production of an energy surplus. Here the archeology of the Eastern United States has provided both pioneering work on plant domestication (cf., Jones 1936; Gilmore 1930) and, most recently has given birth to strategies for data collection. The latter have revolutionized aspects of archeological fieldwork if they have not drastically modified our conception of Woodland economies.

Although a Woodland economy in all periods involved horticulture, it is difficult to evaluate the relative significance of this activity, particularly in light of the prior Archaic experiences with horticulture. While the Archaic cultigens may demand "house gardens" (Lathrap 1987:348), and early varieties of corn may be a manifestation of similar gardens during the Woodland period, they remain economic features of Woodland cultures which are ill-expressed in other aspects of life. It is an understatement to say that the role of an agricultural economy in Woodland cultural evolution remains very much of a question.

At one end of the interpretive spectrum are those who think that plant manipulation was "initially one of many procurement systems in a varied hunting and gathering economy" (Raab et al. 1982:23) which began to increase in importance. This may have had a corresponding effect, so the argument goes, on other aspects of human society and culture; thus, "....the productivity of horticulture as a food resource may have fueled population increase and sedentism. These changes in turn may have acted systemically to reinforce a de-

pendence on horticulture. The result may have been a directional trend toward population growth, shift in settlement patterns, increasing social complexity, and technological change" (Raab et al. 1982:23).

This mode of "systems" reasoning is probably not relevant to the Ohio Valley during the Woodland period. To embrace it one must demonstrate that horticulture became increasingly important through time and that it fueled population growth. Neither intensification of plant manipulation, nor increases in population density can be demonstrated, at least not yet.

The non-linearity of culture change in the Ohio Valley suggests that there was no simple relation between Woodland economics and cultural development. Examples of this non-linearity are viewed in the inescapable evidence that the peaks of Hopewellian cultural development were transitory and had limited impact on Late Woodland period cultures. Moreover, the Middle Woodland period culture lacks evidence of the nucleation of human settlement. These basic observations suggest that the chain reaction of culture development which took place in Middle American and which led to civilization with the development of plant domestication, did not occur in the Eastern United States during the Woodland period, or even for that matter in the Late Prehistoric. It seems unlikely that the lack of such a linear chain reaction was due to the nature of the plants involved, although we must acknowledge that the pace or scale of change did change with the widespread introduction of corn after 900 A.D.. Perhaps it was due to other aspects of a more benign Eastern United States woodland environment, or historical factors which we do not now comprehend.

Similarly, attempts to deal more specifically with regional differences in Woodland culture have not been conclusive in explaining the patterns of cultural development. The initial demonstration that categories of wild plants were genetically modified by humans and were harvested by man during the Woodland period, led Struever (1964) to postulate an enhanced horticultural potential in certain environmental settings. His "mud flat hypothesis," linking Middle Woodland development to the riverine areas of the Mid-West, suggested that environmental variables might explain the differing contours of Middle Woodland development in the area.

Struever's model, which stems from a passive "dung heap" model for the development of agriculture, is now mainly of historical interest. Perhaps more importantly, has been the hypothesis of Seeman (1979:402-407) for the development of Ohio Hopewellian in the Middle Woodland period. He suggests that the organizational complexity of Middle Woodland culture in the Scioto Valley, in contrast for example to the Illinois River Valley, was due in fact to limited room for the system to expand in the local riverine context. In this one situation--admittedly the most complex example of Middle Woodland cultural development in the Eastern United States--it was "cheaper" to overhaul political structure to accommodate population growth, than it was to expand in space out of the bounds of the Scioto and its tributaries.

Yet another of Seeman's conclusions is that, despite the interregional trade during the Middle Woodland (cf., Caldwell 1964), the volume of this trade may have been relatively low. Thus despite the economic base, or perhaps because of it, there may have been far less interregional interaction and less parallel development than has been supposed previously. Under his view,

Middle Woodland period culture may have continued in a number of areas, following parallel but only loosely related tracks. Here Seeman has contributed to the discussion on subsistence an important awareness of the variation in local ecological conditions.

Initially the Woodland period was believed to mark the introduction of ceramics to the Eastern United States; and thus at least with the beginning of the era, there occurred a major modification of Archaic technology. True ceramics were preceded by the use of steatite and sandstone bowls in the Ohio Valley. Although poorly dated in the region they may have been in use as early as circa 1200 B.C. and probably continued in use and overlapped with the introduction of a true ceramic technology. For example, a sandstone bowl was used as a mortuary offering at the Willow Island Mound, a site which dates perhaps as early as 400 B.C. (Hemmings 1978:33-34).

Subsequent research has demonstrated that ceramics did not occur suddenly or widely over the Eastern United States. The introduction of pottery occurred before 2,000 B.C. in the deep Southeast, while other parts of the east began using ceramics as late as c. 500 B.C. Because of this simple reality, the occurrence of ceramics is generally not considered a mark for the beginning of the Woodland period.

The local introduction of ceramics in the Ohio Valley did not occur until late, relative to the rest of the Eastern United States. While the absolute dating is not clear, it is probable that the earliest ceramics in the valley post-date 1,000 B.C. and are derived from mid-Atlantic antecedents (Custer 1987:100-102). By this time in the fiber tempered ceramic producing areas of the deep south, ceramics had been in use for over 1,000 years.

One of the earliest radiocarbon dates advanced for ceramics for the central Ohio Valley is 1560 B.C. ±130 (GX-1248) from the Rais-Swartz Shelter (33Ja4) in Jackson County, Ohio (Shane n.d., 1970; Lafferty 1981:501). There are problems with this date and they are exacerbated by the fact that the original data have not been published in detail. The date and an even earlier one come from Stratum V. Eight plain surfaced pottery sherds were recovered from the surface of this stratum and from a feature within it.

Setting aside the confused evidence from Rais-Swartz, the earliest ceramics in the Ohio Valley, occurring well into the Early Woodland as it has been defined here and not at its beginning, are generally thick and cord-marked. One of the first of these early ceramic types to be defined was Fayette Thick (Griffin 1943, 1945). Recent work at the type site (Clay 1984, 1985, 1987) suggests that the type may be considerably later (circa 350 B.C.) than first supposed, in fact marking the end point in the local development of early ceramics, not the beginning.

Similar ceramics, lacking the distinctive pinched decoration, occur elsewhere in the central Ohio Valley. One of these is Half Moon Cord-Marked (Mayer-Oakes 1955:184-190) which has been found generally in Southern Ohio. The type is known best from a series of rockshelter sites (Griffin 1945). So far the type is not well dated, although recent dates from the Crawford-Gist site near Pittsburgh suggest that Half-Moon Cord-Marked was in existence by 500 B.C. (Grantz 1986).

The latter part of the Middle Woodland period sees the appearance of ceramics in certain sites which are regarded as "Hopewellian" in inspiration. Commonly, these exhibit stamped, decorated surfaces including the stylistic treatments of dentate, rocker, check, zone, and simple stamping. In part these pots are viewed as imports from other regions such as the South (Prufer 1968:10), but for the most part reflect local developments.

This decorated Middle Woodland pottery is always limited in its distribution. It occurs at the larger mound and earthwork complexes, but not generally throughout the Valley. In fact, the discontinuous distribution of classic Hopewellian pottery is a convenient indication of a parallel discontinuity in the distribution of many of the major features of Hopewell.

The distinctive decorative motifs of Hopewellian pottery tend to link the Hopewellian manifestations of the Eastern United States together by their generic similarity (e.g., Scioto Valley Hopewell, Illinois Havana, Mississippi Valley Marksville). On occasion they have been suggested as evidence for culture historical interpretations involving the movement of peoples through space (cf., McMichael and Mairs 1969).

Such reconstructions involving migration are generally discounted today (cf., Wilkins 1979). In most cases they do not point to movement of potteries, or even an interregional trade in pots; they do emphasize that interregional exchange occurred through which flowed other materials of the Hopewellian Interaction Sphere (e.g., copper, mica, shell, and obsidian) and more general stylistic canons in ceramic production.

The lithic technology of the Woodland as a whole sees the continuation of lithic traditions begun in the Archaic. In the early Woodland distinctive biface types, most importantly the ubiquitous Adena Stemmed and its relatives, occur widely. In the Middle Woodland a sequence of forms occurs which suggests rapidly shifting stylistic norms, in part related to the development of enhanced mortuary practices and mortuary offerings, and in part probably to regional differentiation. Adena Stemmed points, important in the Early Woodland, are replaced by Robbins Point, then Snyders Points. Later point types occurring importantly in the Late Woodland include the Lowe Flared Base and others.

Specialized lithic production for mortuary purposes includes large flint blades and points and caches of blanks. A distinctive technology of the Middle Woodland and generally associated with Hopewellian, is a micro-blade industry. There have been various interpretations of the use of the micro-blade but the context of finds in Scioto Valley Sites suggests that they have functioned importantly ceremonially.

The Woodland period in the Ohio Valley marks obvious changes in the fabric of local societies. This is indicated most forcefully in the mortuary practices. Late Archaic burial was generally intramural. Analysis of certain populations like the Green River Archaic (Winters 1963) suggest that while there may have been differences in achieved status between individuals, local Archaic societies were not markedly stratified nor differentiated one from another.

There is an important lacuna in our understanding of Woodland period mortuary ritual which corresponds to much of the Early Woodland as a whole; the requisite sites have been neither located nor excavated. We encounter Middle Woodland mortuary practices involving mound burial, multiple and partial burial, and multiple mortuary modes including in situ cremation, redeposition of cremation, bundle burial, partial burial, and extended inhumation, together with the selective distribution of both body parts and grave goods. These make it obvious that Woodland mortuary behavior had gained considerably in complexity over the Archaic Era. The nature of this evolution, or even its full implications for Middle Woodland period society, is not fully understood.

While it is generally acknowledged that Middle Woodland society was ranked, the exact nature of the ranking is not clear. Moreover, it is likely that the implications of rank differed from area to area. While this was no doubt related to the shifting role which Middle Woodland sites played in regional integration, the exact nature of this is a subject for speculation at present.

Certainly the existence of the accretionary burial mound throughout the Middle Woodland period, varying in complexity yet a constant feature of the cultural landscape, suggests the development of local social divisions, perhaps clans or lineages. These then concentrated their mortuary ritual at the mound "center." This is a decided shift from Archaic mortuary beginnings if the Woodland behavior is an historical derivative of the Archaic.

With the mound, the Ohio Valley sees the establishment of the "cemetery" or the specialized component of the settlement system devoted to mortuary ritual. Intramural burial ceased to be important, depending upon one's interpretation of the data. Still, the complexity of inferred mortuary behavior (expressed in its most complex form in the mound burial of a redeposited cremation of fleshed bone) suggests that stages in mortuary preparation occurred apart from the mound cemetery.

Settlement system reconstruction, like other aspects of the Woodland period, suffers from data gaps. It is one of the ironies of eastern United States archeology that while Late Archaic Period culture is fairly well known in the Ohio Valley from a variety of settlement types (cf., Vickery 1980), Early and Middle Woodland settlement systems are known principally from burial mounds and earthworks. Here the earthworks, because of their size, are quite poorly known in detail, although their existence is certainly acknowledged. Thus mortuary structures, and sites associated with them, must carry much of the brunt of settlement reconstruction.

Addressing Early Woodland Adena (bracketing late Early Woodland and Middle Woodland as defined earlier), Seeman has suggested that burial mounds and structures associated with them, are evidence of mortuary camps (1986). Here he sees expressed in the Woodland period a definite elaboration of mortuary activity over the preceding Archaic.

Seeman's article is one of the first to take issue with a prevailing opinion that Woodland burial mounds were in part or generally built over individual domestic structures (Webb and Snow 1945); and thus, that mounds can be considered simply as components of larger domestic sites (see also Clay 1983).

Seeman's shift in interpretation, in several different ways, has been echoed by others dealing with Adena and Hopewellian materials and is in the process of being forged into a new reconstruction of the place of specialized structures in the Woodland period (cf., Clay 1983, 1986, 1987; Greber 1983).

An essential product of the developing view is a recognition of the divorce between domestic settlements and burial precincts in the Early and Middle Woodland periods. It has led to the idea of a Woodland "cemetery" which involves a functional distinction between mortuary areas that are separate and distinct from living areas. This recognition is slowly replacing a prevailing view of mortuary behavior, one which linked the two in common settlements where burials were made in and around settlements of the living.

Both Greber (1983) and Clay (1986, 1987) have pointed out that sub-mound structures in the Middle Woodland (Hopewell and Adena, respectively) involved the conversion of structures from one use to another. For Greber the Hopewellian "great house", such as she defined it below the Edwin Harness mound (1983), may have begun as a non-mortuary structure. Thus it is probably incorrect to speak of the structures below Hopewellian mounds as charnel houses, although they may have been used as such prior to their conversion to places for the disposal of the dead.

Using Adena materials from northern Kentucky, Clay has made much the same point for slightly earlier materials emphasizing, as perhaps Greber has not, the process of the modification of areas from non-mortuary to mortuary uses. Furthermore, Clay has emphasized, as Greber has not although it is implicit in her writings, the ritual nature of the areas which were involved in mound construction. Both raise, however, the probability that the loci of burial structures were used for different things in sequence. Thus, they indicate a complexity of burial precincts which has been ignored in the past.

To the evidence from burial mounds and the structures which preceded them, must be added the evidence, such as it is known, from the large earthwork enclosures which may date as early as 350 B.C. (Clay 1984, 1985), in fact marking the beginning of the Middle Woodland period. While little work has been done on the interior of these enclosures, they appear to have defined specialized activity areas, not domestic sites (Clay 1987).

These considerations of mounds and earthworks with their redefinition of Middle Woodland ritual and secular precincts do not adequately solve the question of the rest of Woodland period settlement patterns, the domestic side including both habitation sites and special purpose loci. Data gaps surely exist but the problem may not lie simply with them, but with our expectations.

Recent work on Early Woodland materials (Grantz 1986) suggests that river side camps with an Archaic-like profusion of pits may exist, expressing a settlement affinity for riverine site locations like their Archaic predecessors. However, such data are not abundant for the period.

At Duncan Falls (Carskadden and Gregg 1974) and Buckmeyer (Bush 1975), portions of possible Adena base camps have been excavated which contained oval post structures. These structures were similar to those excavated below mounds, but much less regular in form and post spacing. Both of these sites

were situated in river valley locations and apart from burial mounds, and indicate that non-mortuary site types exist to be discovered and explored in more detail.

Both Adena and Hopewellian artifact types are fairly common components of surface collections throughout the Middle Ohio Valley. While it remains to securely link these occurrences to defined archeological contexts, they do indicate that Woodland cultures involved a settlement system, probably not so different from a late Archaic system. The few studies which have been done suggest that there may have been a concentration of settlement in riverine contexts beginning with the Middle Woodland period and extending into the Late Woodland. Actual nucleation of population in concentrated village grew out of this like those which are demonstrable in sites of the Late Woodland (Black 1979; Maslowski 1985). The nucleation of human settlement occurred well after the peak of mound and earthwork development in the Middle Woodland period in the Ohio Valley. Planned and functionally differentiated villages with concentrated populations was not a product of Middle Woodland development.

In the absence of more concrete evidence for settlement variability in the Early and Middle Woodland, extensive reconstruction is difficult and probably not justified. The lack of concentrated Woodland sites such as are known for the Archaic in the Cincinnati vicinity (Vickery 1980), might suggest either a reduction in overall population in the Woodland period (at least prior to the Late Woodland) or a redistribution of population after the close of the Archaic having the effect of reducing local population density, thus archeological visibility of human settlement.

Either population reduction or redistribution, if they occurred in the Middle Woodland, require a reconsideration of the role of intensified mortuary ritual, coupled with earthwork construction. The archeological record does not support the view that the mortuary structure (or the earthwork for example) was an integral element of the nucleated human settlement which drew together those who focused their mortuary ritual in and inside these distinctive structures. Clay has suggested that the burial mound may have been a means to maintain social identity in a society with a tendency to disperse in space and, in essence, to "defy nucleation" (Clay 1986). Woodland period mortuary ritual and human life appear somewhat to go their own ways. It is difficult for the archeologist working within the time period to articulate one with the other. It is logical to assume that the relationship is complex and that simplistic notions, such as those which have resulted in initial formulations of the Woodland as an archeological concept, will probably be wrong.

Around A.D. 400, the Hopewellian ceremonial centers and extensive trade network collapsed in the Ohio Valley, and burial practices became less complex. The decline of Hopewell marked the beginning of the Late Woodland subperiod. In areas such as Illinois or Ohio where Hopewellian influence was greatest, Late Woodland marks a return to a less complex way of life. In other areas where Hopewellian influence was minimal, Late Woodland witnessed the continuation of a generalized Woodland lifestyle of an increasing dependence on domesticated plants, coupled with hunting and gathering.

Late Woodland artifact inventories are difficult to differentiate from the Early or Middle Woodland sub-period assemblages that do not show Adena or Hopewellian cultural affiliation. During the Late Woodland, small triangular projectile points appear in artifact assemblages. The presence of triangular points is frequently used to infer that the bow and arrow came into use at this time. Other Late Woodland projectile point forms include Jack's Reef Corner Notched, Chesser, and Levanna points. While regional ceramic sequences have not been developed, most Late Woodland ceramics are generally cordmarked. Variability in ceramic tempering agents is thought to reflect regional and not temporal developments (Purrington 1967b:124). A number of Late Woodland phases have been defined in the middle Ohio Valley: Newtown (Griffin 1952), Peters (Prufer and McKenzie 1966), Chesser (Prufer 1967), Watson Farm (Mayer-Oakes 1955), and Buck Garden (McMichael 1965). The latter is most pertinent to the study area.

Unfortunately, Buck Garden is poorly defined and difficult to isolate. The pottery is tempered with flint, crushed igneous rock, and limestone (McMichael 1965; Maslowski 1983). Vessels tend to consist of elongate jars exhibiting semi-conical to conical bases. Buck Garden rim sherds suggest that the rims are flared with somewhat constricted necks. Cordmarking frequently occurs on the squared to rounded lips. Some Buck Garden rim sherds appear to be collared, a result of folding, and others are collared. Buck Garden dates from about A.D. 500 to 1150 or 1200 A.D.

Many sites contain "Woodland" components that cannot be placed in time with any degree of precision. Only a few broad statements can be made regarding the "generalized" Woodland sites identified from survey. They are located in rockshelter (Kuhn et al. 1978) and open bottomland contexts. Cordmarked and plain ceramics predominate. A variety of tempering materials used throughout the period and in different regions dispels the notion that tempering materials underwent a unilineal replacement through time. A variety of projectile point styles have also been noted. The recovery of triangular projectile points in association with non-shell tempered ceramics indicates that the bow and arrow came into use for hunting during the Woodland period.

The Late Prehistoric Period (A.D. 1150 - 1650). The Late Prehistoric archeological complex of the middle Ohio Valley is Fort Ancient, which spans the time from approximately A.D. 1150 to about A.D. 1700. Geographically, Fort Ancient extends from western West Virginia to south-eastern Indiana and from south-central Ohio to north-central and northeastern Kentucky (Griffin 1978:551).

The development of Fort Ancient and its relationship to Late Woodland cultures has been and continues to be a hotly debated issue. Two hypotheses have been offered in explanation for the relationship between Fort Ancient and Late Woodland cultures. One hypothesis suggests that Fort Ancient represents the fluorescence of an indigenous Late Woodland culture (Graybill 1980:55-56; Rafferty 1974). Others suggest that Fort Ancient represents an influx of Mississippian peoples from the lower Ohio River Valley (Essenpries 1978:154-155). Although the question has yet to be resolved, it is entirely possible that each of these hypotheses may be correct, depending upon the data set and region one employs to address the problem. Essenpries (1978), for example, has

suggested that these two hypotheses are appropriate for explaining Fort Ancient manifestations at different times during the Late Prehistoric Period. In this scenario, Fort Ancient is viewed as a fluorescence of Mississippian-influenced Late Woodland culture during the early phases (Baum, Anderson and Feurt phases) and as an influx of Mississippian peoples during the later Madisonville phase (Essenpries 1978:164).

Other investigators argue that not all local Late Woodland groups chose to participate in, or accepted, the Mississippian cultural complex (i.e., horticulture and sedentism), and instead they continued to follow their essentially Woodland (Late Archaic) way of life. The very few absolute dates from Fort Ancient sites and the almost complete lack of stratigraphic data and intersite comparative data contributes to the confusion (Griffin 1978:557), and these explanations must remain hypotheses for future testing.

Regardless of whether or not Fort Ancient developed out of an indigenous base, or whether it represents a population influx, it does reflect an elaboration of Late Woodland subsistence activities and social organization. Settlements were much more nucleated, as evidenced by large village sites (Mayer-Oakes 1955). These village sites tend to be situated in valley bottoms along the main stems of the region's larger drainages (Graybill 1978, 1979). Smaller sites tend to be located throughout tributary drainages and are thought to represent seasonal camps and resource procurement activity stations. Some major sites along the Ohio River, or close to it, were fortified; and many have central courtyards or plaza areas (Griffin 1978:552).

Fort Ancient peoples had an increased reliance on the cultivation of maize, coupled with beans and squash. Despite the increased importance of horticulture, hunting remained an important source of food. Deer was the main meat source; at some sites it made up to 80% of the game consumed (Griffin 1978:552). More elaborate ceramic styles, usually tempered with crushed mussel shell, although limestone and grit tempered ceramics also occurred, triangular arrow points, mussel shell tools (e.g., knives, scrapers and hoes) also serve to distinguish Fort Ancient cultures from Late Woodland populations.

Although Fort Ancient subsistence, like that of Mississippian populations, was based on the cultivation of corn and other cultigens, other aspects of Fort Ancient clearly distinguish it from the contemporary Mississippian occupations at such sites as Angel (Black 1967) and Kincaid (Cole et al. 1951). Fort Ancient sites lack large ceremonial centers and earthworks. A complex settlement hierarchy such as that described above for Mississippian culture does not occur in Fort Ancient. Villages and hunting camps have been the only Fort Ancient site types defined thus far. Important Fort Ancient sites in the vicinity of the project area include May More Village and Roseberry Farm and Fort Ancient/Protohistoric sites such as Buffalo, Orchard, Clover and Rolf Lee (U.S. Corps of Engineers 1980).

CHAPTER IV. METHODS

Fieldwork associated with this project was completed between October 15 and November 2, 1988. The phase one survey was conducted by first plowing strips in 20 meter intervals over the entire project area. These strips were systematically walked and all artifacts were collected and bagged according to site number. Artifacts were also flagged with surveyor's pin flags for each site investigated. This allowed determinations to be made regarding artifact clusters and relative densities of artifacts. Some areas such as wooded areas and unharvested croplands could not be plowed. In these cases, crew members walked parallel transects that were spaced at 10 m intervals. Where vegetation inhibited surface visibility shovel tests were excavated at 15 m intervals within each transect. These shovel test varied in depth between 25 cm and 45 cm depending upon the depth of the plowzone. In addition, the river bank was carefully examined along the entire 2 mile-long project area.

The phase two testing of the Jenkins House Site (46CB41) was accomplished by first setting up a grid of 10 x 10 meter test squares marked with wire survey flags over the entire houselot. Every flag on the grid, and all corners of the house were mapped with a transit, and the data were entered into a Toshiba laptop computer. These data were subsequently plotted in conjunction with contour data to produce a computer generated map of the site.

After carefully removing the sod, an auger was used to drill test holes at the center of each 10 x 10 m square. Each auger test was excavated to a depth of 50 cm bgs or until sterile subsoil was encountered. The fill from each auger test hole was screened using 1/4 inch mesh screen. The sides of each hole were scraped back with a trowel and observations were recorded concerning horizons present and depth to subsoil. Munsell colors were recorded for each horizon. Artifacts were bagged and marked by provenience. The auger holes were then refilled and sod was replaced.

One of the main objectives was to locate the original kitchen and law office foundations which were expected to be placed adjacent to east and west sides of the house, respectively. Therefore 1 x 2 m test units were placed to the east and west of the main house. An additional test unit was placed under a window flush with the rear of the house in order to locate and sample the builder's trench. Unit excavation was accomplished by shallow shovel skimming and trowel scraping. Each unit was excavated in 10 cm arbitrary levels depending on the depth of deposit and observed conditions. Standardized level forms were completed for each level excavated.

When subsurface features were encountered, their dimensions were measured, sketched, and photographed. Standardized feature forms were completed for each feature encountered.

Laboratory methods consisted of two parts: processing and analysis. Processing the artifacts and samples involved washing (when appropriate), sorting and labeling. Analysis of artifacts recovered was conducted by Cultural Resource Analysts' personnel.

Cataloging of historic materials was conducted utilizing a typology and computer coding system similar to that developed for both the Oxon Hill Manor Archaeological Site Mitigation Project (Garrow and Wheaton 1986) and the Covington Urban Testing and Mitigation Project (Genheimer 1987). An identical system was recently developed for the Frankfort East Main Street Project (Genheimer 1988) and for the Burdine House study (Genheimer and Hughes 1988). Each of these typologies were developed to facilitate the cataloging and analysis of large quantities of artifacts from urban context. The Jenkins House Site code book was developed with as similar goal -- to expeditiously accommodate the quantity and range of artifacts recovered from urban context. The general organization was by functional group category (cf. South [1977:99-102]). Group was subdivided by Class, the artifact raw material, and further subdivided by Type and Subtype.

The code book (Appendix A) was arranged to identify artifacts by Group, Class, Type, and Subtype utilizing standard alpha-numeric codes. en functional groups were recognized: they were Kitchen (K), Architecture (A), Furniture (F), Arms (R), Clothing (C), Personal (P), Tobacco (T), Activities (Z), Miscellaneous (M), and Industrial (N). Seven material classes were recognized: they were ceramic (c), glass (g), metal (m), plastic (p), biological (b), stone (s), and twentieth century (t). The letters trailing the functional groups and material classes were used to designate artifact types during cataloging. The Type referred to a generalized artifact class (e.g., ironstone, nails, window glass, etc.), while the Subtype presented a specific artifact description (e.g., luster decorated ironstone, 4d cut nails, green window glass - 1 mm thick). Both Type and Subtype received two digit numeric designations (01-99). For example, Kc1103, referred to undecorated whiteware within Kitchen group ceramics.

All artifactual material was cataloged onto coding sheets which solicited information on material provenience, count, weight (biological materials only), the Group, Class, Type, and Subtype of the artifact. Identification data (see below) was also included. Data was subsequently entered into Dbase III+, a commercially available data base management system. All material sorts and analyses were conducted within that system.

All artifacts with legible or partially legible information (e.g., labels, embossing, printing, stamping, etc.) were issued discrete Identifier Numbers. The list of Identifiers has been assembled, and is included as Appendix B.

An archival study of the Greenbottom project area and of the Jenkins House specifically, was completed by Jack Dickinson. This contents of this historical survey are provided in Appendix C.

Catalog numbers, consisting of unique accession numbers assigned to the collection by Blennerhassett Historical Park Commission, Parkersburg, West Virginia, were assigned to unit levels, features, or other individual archeological excavation entities. Artifacts were also assigned to this catalog number. Accession numbers were also assigned to all negatives and black and white photographs. Labeling took place once the analysis of the artifacts associated with this catalog number had been completed. In the case of special artifacts, a unique artifact number was assigned to each. Diagnostic artifacts and formal tools were labeled and cataloged individually. All

other artifacts were placed in appropriately labeled, deterioration-resistant container, and the items cataloged with lot numbers. Analytical methods used for specific for specific classes of artifacts, e.g. stone tools, are outlined in the materials recovered section of this report.

CHAPTER V. MATERIALS RECOVERED

Lithic Analysis

One aspect of artifact analysis centered on the lithic assemblages recovered from the collection of sites at Greenbottom. While chipped stone material cannot be considered fully representative of prehistoric artifact assemblages, its durability contributes to the dominance of this material in most archaeological investigations. Such was the case for the phase one investigations at Greenbottom. Three fundamental components of the lithic assemblage were analyzed: a) technological analysis of lithic manufacture; b) functional analysis of tools; and c) stylistic comparison of tools. Each of these three aspects of the lithic analysis is discussed below.

Technological analysis of lithic manufacture is clearly basic to all lithic analyses. Technological analysis of chipped stone manufacture generally followed the lithic reductive model of Collins (1975). In this model, the processes of chipped stone manufacture and use are perceived as a series of five ordered stages: a) acquisition of raw materials; b) initial reduction; c) primary flaking: d) secondary flaking; and e) use and/or recycling. It is within this framework that the lithic assemblage will be described. The use of the Collins (1975) model contributes the necessary vehicle by which prehistoric behavioral correlates of lithic manufacturing and lithic use loci may be examined on an intersite and intrasite level.

Tools were assigned to a series of functional categories on the basis of general morphology. The morphologically derived functional classification used closely followed that defined by House (1975:55-73) in connection with the Cache River project, Arkansas. Obviously, not all of the type categories defined for the Cache River project were encountered at the sites considered here. Therefore, portions of House's typology were deleted, and his definitions were expanded as was necessary to describe the range of variability in the lithic assemblage encountered. Definitions of the functional categories used in this analysis are listed below under the appropriate reductive stage.

Initial Reduction. As Collins (1975:21) has noted, the initial reduction of lithic raw materials is limited to the preparation of the stone for subsequent use and further reduction. Prepared cores, detached flakes, debris, and flawed and rejected cores have gone through the first step of reduction. Three options of emphasis are available to the tool maker: (1) concentrate on shaping the core and discard all detached flakes, (2) optimize the detachment of suitable flakes or blades and discard the exhausted core, or (3) compromise and retain both the core and the detached flakes. Unretouched flakes may become tools at this phase. Unmodified flakes may occur in any of the reductive stages defined but are described as initial reduction by-products in this report. Unmodified flakes are further subdivided into three categories: primary flakes, secondary flakes, and tertiary flakes. Definitions for each