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PREHISTORIC CONTEXT STUDY (CHAPTER THREE)
IN SUPPORT OF
DATA RECOVERY AT SITE 36AL480,
LEETSDALE, ALLEGHENY COUNTY, PENNSYLVANIA
(CONTRACT NO. DACW 69-98-D-0027, TASK ORDER DV01)

FINAL

PHMC ER #1999-2661-003

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CHAPTER 3. PREHISTORIC CULTURAL CONTEXT

By Carol S. Weed

INTRODUCTION

Under contract to David Miller & Associates, Inc., the U.S. Army Corps of Engineers, Pittsburgh District (District) requested that Gray & Pape, Inc., Cincinnati, Ohio (Gray & Pape), complete a study directed to developing the prehistoric context for Site 36AL480. The subsequent work was completed under Contract No. DACW 69-98-D-0027, Task Order DV01.

The goal of the work is to provide a contextual baseline for the evaluation of the prehistoric data recovered from the excavations in Areas 1, 2, and 3 at Site 36AL480. The context responds to the issues raised in the District-developed Research Design. Per the District's Scope of Work (SOW), Gray & Pape's work for the Project is consistent with the following: the Secretary of Interior's Standards and Guidelines (U.S. Secretary of the Interior 1983:44716-44742); the guidelines of the Advisory Council on Historic Preservation (ACHP) (36 CFR 800) (ACHP 1986); and the Pennsylvania Historical and Museum Commission, Division of Archaeology and Protection, Bureau for Historic Preservation's (PaBHP) Cultural Resource Management in Pennsylvania: Guidelines for Archaeological Investigations (July 1991 [reprinted 2001]) (PaBHP 1991).

Project Setting

Site 36AL480 is located in Leetsdale near Sewickley, Allegheny County, Pennsylvania. The site lies on the T-2 and T-3 terraces between the Ohio River and an abandoned channel of that river. Based on the results of the geomorphological and archaeological investigations of the site, the locale was once an island. By Late Archaic times, however, the backchannel was no longer active and the site's setting had been absorbed into the mainland.

The site has been subjected to controlled archaeological investigations and companion geomorphological work since 1999 (Davis 2000, Vento 2002). The data recovery investigations have been completed in three pre-selected areas within the larger site. These locations are Areas 1, 2, and 3. Data recovery excavations in Area 3 began in June 2001 and were completed in late 2001. Phase III investigations of the prehistoric components in Areas 1 and 2 began in 2002 and ended in 2003. Volunteer excavations also were conducted in Area 3 in 2001 and again in 2002.

Scope of Work

According to the District's SOW, the specific objectives of the context study are:

(a) Collect and interpret data relating to previously recorded archaeological sites within the Ohio River Subbasin 20 drainage basin in Pennsylvania (Figure B1).

(b) Provide a detailed cultural overview of the region using information from southwestern Pennsylvania, the Upper Ohio Valley, the Appalachian Plateaus physiographic province, and the eastern United States.

(c) Prepare a context for the five major research themes identified in the data recovery plan.

(d) Prepare a report on the findings.

To meet these objectives, the SOW specified that the contractor would (1) conduct data recovery-level research to develop a prehistoric context; (2) conduct studies to identify lithic material types and functional types in the local region (Pennsylvania Department of Environmental Protection [PaDEP] Ohio River Subbasins 20B, 20D, and 20G); and (3) prepare a technical report on the findings.

In the remaining sections of this chapter, the Project results and conclusions are detailed. The methods used to complete the various tasks are presented in Appendix A. The remainder of the chapter is divided into four major subsections: Environmental Setting, Previous Archaeological Studies, Prehistoric and Protohistoric Contexts, and Conclusions. The period discussions in the Prehistoric and Protohistoric Contexts section begin with Paleoindian and end with the Late Woodland, Late Prehistoric, and Protohistoric overview. Research issues are presented at the end of the Environmental Setting and period specific discussions in the Prehistoric and Protohistoric Contexts.

The final section, Conclusions, addresses issues raised by the literature review that are pertinent to each of the research themes but which were not specific to either the environmental summary or specific time periods. The references and Appendices A through J finalize the chapter.

ENVIRONMENTAL SETTING

The discussion that follows sets the environmental stage for the period-specific contexts. This section is divided into three major parts: an introductory characterization of the current environmental setting at the Site 36AL480 location, the Holocene environment, and research issues.

Modern Environment

In the following section, the study region is characterized environmentally. This discussion includes overviews of the physiography and drainage, soils, geology and regional lithic resources, and the modern climate, flora, and fauna.

Physiography and Drainage

Site 36AL480 is located in the Appalachian Uplands (also referred to as Plateaus) physiographic province on the Allegheny Plateau (State Water Plan Division [SWPD] 1983:8, Van Diver 1990:12). The plateau covers all but the southcentral and southeastern quadrants of Pennsylvania and it extends west into Ohio, north into New York, and south-southwest to Alabama (Van Diver 1990:12). In western Pennsylvania, most of the Plateau is within the so-called Ohio Basin (Figure B1) and it encompasses parts of the Kanawha and Southern New York physiographic sections (Figure B.2). From west to east, the region is marked by gradually increasing elevations as the foothills and relatively shallow valleys of the western plateau in Ohio give way to the pronounced and more deeply entrenched valleys of the eastern plateau reaches in Pennsylvania.

The Ohio Basin is drained by four major rivers (the Allegheny, Monongahela, Ohio, and Youghiogheny) and is subdivided into five subbasins which have been designated by the PaDEP as: 16 (Upper Allegheny subbasin), 17 (Central Allegheny subbasin), 18 (Lower Allegheny subbasin), 19 (Monongahela subbasin), and 20 (Ohio subbasin). Other portions of the plateau are drained through the Delaware, Erie, Genesee, Potomac, and Susquehanna basins (Figure B2).

In the near area, the geographical focus of the context research was on the PaDEP-defined Ohio Subbasin 20 counties (Allegheny, Beaver, Butler, Crawford, Greene, Lawrence, Mercer, and Washington) in Pennsylvania (Figure B1). The extreme southwest corner of Venango County also is incorporated in Subbasin 20, but the site file search was not extended to this county because of the limited exposure.

PaDEP Subbasin 20 is divided into seven drainage-specific subareas. These are designated 20A through 20G. The Upper Ohio Valley (UOV) drainage basin (Figure B1) also encompasses parts of Ohio and West Virginia. The Ohio counties that are drained by major tributaries of the upper Ohio River and the upper Ohio River proper include Ashtabula, Belmont, Carroll, Columbiana, Geauga, Harrison, Jefferson, Mahoning, Monroe, Portage, Stark, and Trumbull. In the West Virginia segment, the UOV main stem counties which are drained into the Ohio Basin are Brooke, Hancock, Marshall, Ohio, and Wetzel. Table 3.1 summarizes the counties and watershed associations that formed the geographical backbone of the context study.

Table 3.1. Study Area Watersheds, Major Streams, and Counties			
State	**Watershed**	**Major Streams[1,2,3]**	**Counties**
Ohio	Mahoning	89 named streams	Ashtabula, Columbiana, Geauga, Mahoning, Portage, Stark, Trumbull
Ohio	Mahoning, Upper Ohio	1 named stream (Mahoning)	Columbiana
Ohio	Shenango	23 named streams	Ashtabula, Trumbull
Ohio	Upper Ohio	99 named streams	Carroll, Columbiana, Jefferson, Harrison, Mahoning
Ohio	Upper Ohio – Wheeling	116 named streams	Belmont, Harrison, Jefferson, Monroe
Pennsylvania	20A	Shenango River, Neshannock Creek	Crawford, Lawrence, Mercer
Pennsylvania	20B	Beaver and Mahoning rivers, Little Beaver Creek	Beaver, Lawrence
Pennsylvania	20C	Slippery Rock and Connoquenessing creeks	Allegheny, Beaver, Butler, Lawrence, Mercer
Pennsylvania	20D	Raccoon, Cross, and King creeks	Allegheny, Beaver, Washington
Pennsylvania	20E	Wheeling-Buffalo and Pennsylvania Fork Fish creeks, Enlow Fork, Ten Mile Creek	Greene, Washington
Pennsylvania	20F	Chartiers Creek, Saw Mill Run	Allegheny, Washington
Pennsylvania	20G	Upper Ohio River, Sewickley Creek, Montour Run	Allegheny, Beaver
West Virginia	Upper Ohio	29 named streams	Brooke, Hancock
West Virginia	Upper Ohio – Wheeling	132 named streams	Brooke, Ohio, Marshall, Monongalia, Wetzel

[1] OH and WV watershed data from Geographic Data Technology, Inc. (n.d.)
[2] PA major streams are part of the watershed name used by PaDEP.
[3] PA watershed stream order defined in Pennsylvania Office of Resources Management, Bureau of Water Resources Management (1982)

Within Subbasin 20, Site 36AL480 is located along the right bank of the Ohio River south of its confluence with Big Sewickley Creek. The site extends northward from the confluence for a distance of 700 m (2296 ft) (Vento et al. 2002). The site area is marked by the presence of four fluvial landforms:

> "(1) a narrow low-lying T_1 floodplain zone situated about 4 m (13 ft) above the active river channel; (2) a slightly higher and broader T_2 terrace which lies about 5.5 m (18 ft) above the active river channel and appears confined to the northern portion of the Project area; (3) a broad T_3 terrace which lies some 6

to 7 m (20 to 23 ft) above the active river channel and is bound to the west by a relict back channel zone and to the east by either the lower-lying T_1 or T_2 terrace scarps; and (4) a low-lying and marshy relict back channel zone which lies immediately west of the T_3 terrace" (Vento et al. 2002:2).

Soils

The subbasin soil associations are summarized on Table 3.2. The soils were, and are, formed from four parent materials: noncarbonate sedimentary rock; carbonate sedimentary rock; glacial till; and unconsolidated, water-sorted material (SWPD 1983:22-25).

Table 3.2. Subbasin 20 Soil Groups and Associations

Parent Material	Substratum Material of Origin	Soil Association	Comments
Weathered from noncarbonate sedimentary rock	Yellowish and brownish sandstone, shale and siltstone	a. Culleoka-Weikert b. Gilpin-Ernest-Wharton c. Gilpin-Upshur-Weikert d. Hazleton-Gilpin-Ernest	Soils of this parent group occur in Subbasin 20 in Allegheny, Beaver, Butler, Greene, and Washington counties.
	Reddish, yellowish, and brownish clay shale	a. Cavode-Wharton-Gilpin b. Upshur-Gilpin-Clarksburg	
Weathered from carbonate sedimentary rock	Calcareous shale, limestone, and sandstone	Guernsey-Culleoka	Soils of this parent group are restricted in Subbasin 20 to northwestern Washington County.
Formed in glacial till	Substratum is grayish	a. Canfield-Ravenna b. Hanover-Alvira c. Ravenna-Frenchtown d. Sheffield-Plateau	Soils of the parent group occur in Subbasin 20 in Crawford, Lawrence (extreme northern), Mercer, and Venango counties.
Formed in unconsolidated water sorted material	Stratified fluvial sand, silt, and gravel	a. Monongahela-Philo-Melvin b. Wayland-chenango-Braceville	Soils of this parent group occur in all Subbasin 20 counties.

In the general site vicinity the soil group origins were formed in unconsolidated water sorted material or were weathered from noncarbonated sedimentary rock. The soils in both groups have depths reaching "60 inches or more" (SWPD 1983:23) though soils of the noncarbonate origin group may be shallower in the uplands. Overall, the soils in both groups are marked by slow water transmission and water infiltration rates. The solum in the unconsolidated group may have layers which impede downward water movement.

According to Vento et al. (2002:5), the site-specific soils are mapped as Urban Land though they indicate that less than 40 percent of the site area falls in that type. They assign the remaining soils to the Pope fine sandy loam or Pope silt loam series (0 to 3% slopes). These alluvial soils are considered "moderately thick, moderately well drained to well-drained" (Vento et al. 2002:5).

Geology and Lithic Resources of the Region

As noted by Vento et al. (2002), Site 36AL480 lies within an area marked by "gently folded Devonian through Permian age sedimentary rocks which display shallow dips of less than 5^{o} to the south/southeast or south/southwest, while the strike varies between 60^{o} and 85^{o} east of true north." There are four primary sources for the chipped stone raw materials in the region: glacial lag pebbles and cobbles, river deposited pebbles and cobbles, in-situ quarry rock, and imported quarry rock and/or blanks. The glacial lag pebbles and cobbles were dispersed initially by glacial advances and retreats. These materials also are displaced as outwash along the streams and creeks of the region. However, the origin of the local pebble chert (LPC) in the region is not completely glacial. Some of the pebbles and cobbles represent river worn native materials. Without chemical or microscopic examination, it is virtually impossible to visually distinguish glacial vs. river origin cobbles and pebbles (Smith personal communication 2002; also Craft 1979). Thus, in the absence of an expedient way to determine the origin of these LPC, it is perhaps best to simply restrict the use of the terms 'Local Pebble Chert' to those items with obvious cortical rind.

The dual-origin of the pebbles and cobbles, in recent times, begin prior to the Laurentide glaciation when the ancestral Allegheny River flowed north from headwaters in Pennsylvania (Leverett 1957:92-94). It flowed opposite its present course past Olean and Salamanca in New York's Southern Tier, then continued northwest through Randolph in the valley now occupied by the southeast-flowing Conewango Creek. An early Pleistocene ice sheet advance blocked this channel, creating a temporary lake, which eventually spilled over the divide to the south in the vicinity of Kinzua, Pennsylvania (Muller 1963:31-33). The subsequent southward course of the Allegheny carried the meltwaters from a succession of proglacial lakes beginning about 20,000 B.P.

With the glacial advances and the subsequent meltwaters, the till was displaced. Today, Allegheny Plateau till deposits can still range from a few feet on some hilltops to more than 3 m (10 ft) deep on higher ridges. As noted in Walsh and Weed (1998), "colluvial accumulations and small alluvial fans are known to occur at the margin of many broader, U-shaped valleys and are sometimes difficult to distinguish from glacial till and periglacial features". Muller and Cadwell (1986) note that outwash deposits occupy the floor and terraces of many western New York and northwestern Pennsylvania stream valleys.

Because of the complex prehistoric origins for these raw materials, the axiomatic assignment of LPC as the rock type may be masking important connections. For example, the artifact inventory for Davis' 1999 Phase I and II Site 36AL480 assemblage housed at PaBHP lists 94.7 percent of the chipped stone (n=1372) as LPC; the other four materials listed are Onondaga chert (n=2), Flint Ridge chert (n=9), Kanawha chert (n=1) and jasper (n=1).

Many of the Site 36AL480 items, however, retained no cortex and there is no way to confirm that LPC is the source of the material. The reexamination of the collection resulted in the categorization of raw materials as presented on Table 3.3.

Table 3.3. Site 36AL480 Lithic Raw Materials Based on Reexamination of the Davis 1999 Collection		
Material	**N =**	**% =**
Chert, Kanawha	1	0.6
Chert, local pebble (cortex present)	78	45.1
Chert, Onondaga (LPC)	24	13.9
Chert, Uniontown-like (LPC)	1	0.6
Chert, Monongahela	2	1.2
Chert, Monongahela (with heavy patination)	1	0.6
Chert, Ohio Flint Ridge (OFR)	5	2.9
Chert, Onondaga	6	3.4
Chert, Onondaga (no cortex)	11	6.3
Chert, Ten Mile (no cortex)	1	0.6
Chert, unidentified	24	13.8
Chert, unidentified (no cortex)	17	9.8
Chert, Uniontown (some patination)	1	0.6
Jasper	1	0.6
Total	**173**	**100.0**

Although LPC is present in the collection, items manufactured of Kanawha, Monongahela, Ohio Flint Ridge, Onondaga, Ten Mile, and Uniontown cherts also are present and represent 16.1 percent of the assemblage. The occurrence of Onondaga and Uniontown-like material as LPC suggests, however, that at least those two material types could have been acquired locally as pebble cores. This, obviously, is not the case with the Ohio Flint Ridge and its occurrence in the collection was limited to expedient (3 utilized flakes) and formed (one unifacial/bifacial scraper, one unidentified projectile point fragment) tools.

Dr. Robert Smith of the Pennsylvania Geological Survey conducted an examination of samples from the Site 36AL480 collection on February 21, 2002. The results of his examination strongly suggest: (1) microscopic examination of lithics of probable glaciofluvial origin can result in the definition of specific sorting criteria; and (2) selection of specific glaciofluvial rock types may be occurring. As regards the first issue, Smith macro- and microscopically examined cultural items from the collection. Included on Table 3.4 are the original artifact catalog number, the Appendix D figure reference, the original classification and material of the artifact, and notes made of Smith's verbal description.

Several of the pieces examined by Smith contained bitumen-like elements that he believes are diagnostic of common sources for the glaciofluvial materials. Smith also was asked to examine a single bag of chipped stone that, according to the catalogue, contained434 items including flakes, shatter, utilized flakes, and whole and fragmentary bifacial tools. He concluded the following concerning the raw materials represented among the artifacts (Robert Smith, personal communication 2002).

Table 3.4 36AL480 Sample Artifacts and Material Descriptions		
36AL480 / Catalog # (App. D Figure and Position)	**Category Type and Material**	**Smith Comments on Material**
/12.1 (Figure D26, Top 1)	Projectile Point, side notched reworked as drill; Onondaga	Grayish brown chert of medium quality. Abundant limonite sphericals. Use patination present on object.
/17	Biface; Ohio Flint Ridge	Uniform gray chert (not OFR) of medium high quality. Floating bitumen-like elements.
/20	Projectile Point, small stemmed; local pebble chert	Uniform gray chert of decent quality. Trace of floating bitumen-like elements.
/23.1 (Figure D26, Top 6)	LeCroy bifurcate; Kanawha chert (classified by Davis as Kanawha bifurcate)	Medium dark gray, medium to good quality; flint-like but could be quartzitic though it could be Kanawha as well. Translucent rather than opaque.
/25.1	Projectile point, side notched; local pebble chert	Brownish chert, good grade of material. Chert is slightly translucent. Contains abundant chalcedony areas ranging from milky to translucent. Chalcedony areas are not breaking choncoidally.
/26.1 (Figure D26, Middle 4)	Projectile point, side notched; local pebble chert	Translucent light chert with a hint of fossils. Iron staining could mean parent material was close to rind or quarry face edge.
/26.2 (Figure D26, Middle 5)	Projectile point, side notched; local pebble chert	Black flint low quality material. Has laminations. Material is unusually opaque. Cortical retention both ends. Starting with smallish cores?
/33?	Biface tool fragment; local pebble chert	Laminated, slightly mottled grayish brown chert. Could be Flint Ridge and is chalcedony-like. Little oval fossils are sparsely present. The material is microporous and the laminations are distinctive.
/38.1 (Figure D26, Middle 6)	Projectile point, small stemmed; local pebble chert	Gray/blue gray low quality quartzite containing finely disseminates muscovite mica. Material was out of a sedimentary base and could be out of the Canadian shield.
/53.1 (Figure D26, Bottom 3)	Projectile point; Onondaga	Mottled tan low quality chert with open vugs. Probable brachiopod traces. Open voids that are grossly rhomboidal are present. Material may be Huronian or Gull River chert rather than Onondaga.
/62.1 (Figure D26, Bottom 4)	Projectile point, stemmed; local pebble chert	Mottled brown and buff, low quality marine chert with crinoid inclusions. Probable cortex present (could be LPC). A little reddening on cortex on stem (may be heat-treated).
/62.2 (Figure D26, Bottom 5)	Projectile point, side notched; local pebble chert	Blue/gray chert of medium quality. Bitumen-like elements are present.
/64.1 (Figure D26, Bottom 1)	Projectile point; local pebble chert	Slightly bluish/gray, high quality chert. Finely disseminated bitumen-like elements. One area of chalcedony and one open vug. Microporous and cavities are various shapes.

There is no apparent natural gradation from the tan to the blue/gray chert observed in the collection. This suggests there may be selection for both materials.

- The 'reddish' chips [e.g. flakes] are a third group of material. They are all breaking the same and are not breaking like other materials in the assemblage.

- 'Immobile and incompatible' trace elements are present in the raw materials that make them good candidates for grouping and assigning source.

- Cortex free samples are needed from the site vicinity to determine if the natural rock population contains the observed groups and at the same level of incidence as in the culturally modified sample.

Continuing with the discussion of local pebble cherts, many instances of chattered and rounded cortical surfaces were observed in all of the sample collections, including those from Site 36AL480. Thus, there is every reason to believe that much of the rock used for chipped stone tool manufacture is glacial/river LPC. The abundance of these materials, however, did not eliminate the systematic exploitation of non-till deposits during prehistory. The local, non-till materials are the third category of raw materials. Included in this grouping are blue, Loyalhanna, Monongahela, Sky Hill, and Uniontown cherts.

The final category of raw material includes rock types that may represent imported material blanks (Richard George, personal communication 2001; Lantz 1985; Vento et al. 2002). Some of these rock types, however, also may be occurring as glacial/river LPC. The literature review indicates that the following raw material types can be expected: argillite; Brush Creek chert, Delaware chert, Hughes River chert, Huronian chert, Lockport and Loyalhanna cherts, Kanawha and Kittatinny Supergroup black cherts, Monongahela chert, Ohio Flint Ridge (Vanport formation) chert, Onondaga chert, Prout and Plum Run cherts, Sky Hill and Zaleski cherts, Ten Mile chert, Uniontown chert, Upper Mercer (including Cochocton and Vanport) chert; chalcedony; greenstone; jasper; quartz and quartzite (though in small numbers); and rhyolite (also in small quantities) (Figure B4).

Lithic Raw Material Type Descriptions

The physical characteristics and general areas of origin for these various stone types are summarized below (Figure B4). Also noted in the descriptions, as warranted, are references to particular temporal period associations or site collections which contain examples of the raw material.

Argillite is grayish black metamorphosed siltstone, shale, or mudstone that lacks bedding planes but is very suitable for the manufacture of tools (Custer 1996; Kinsey 1972). It was available in the Piedmont uplands outside of the study area and it seems to occur most often in western Pennsylvania as imported objects.

Chalcedony is a fibrous variety of cryptocrystalline rock resulting in a more porous structure than microcrystalline quartz (Luedtke 1992). This raw material is usually

translucent and vitreous in luster and occurs in a wide range of colors (Kozarek n.d.). Chalcedony is present in glaciofluvial deposits and it occurs *in situ* in the Ohio portion of the study area.

Greenstone is a dense metamorphic rock, pale gray-green to yellowish green dependant upon the proportions of chlorite, epidote, and actinolite to the other minerals present in the rock. Narrow veins of quartz and calcite often traverse the rock, which has a dull luster (Kozarek n.d.). This raw material would have been available in local glaciofluvial deposits.

The term Jasper in this context is granular cryptocrystalline quartz with dull luster. Thermal alteration may substantially improve the luster with concomitant changes in color. The color change, however, may be restricted to the stone's surface and the surface may appear waxy. Colors range from yellow ochre, to brown and red. These raw materials would have been available in central and northeastern Pennsylvania (Custer 1996; Kinsey 1972; Wray 1948). Jasper also may be moving into the region via the upper headwaters of the West Branch of the Susquehanna, out of the Bald Eagle region, and via the headwaters of the Juanita River.

Brush Creek chert occurs within the formation of the same name. In Ohio, the formation outcrops from Columbiana County south to Lawrence County; it is present in Pennsylvania in Allegheny, Butler and Fayette counties. According to Stout and Schoenlaub (1945:94) the chert is "gray to nearly black flint", though Vento (1982:710-711) notes colors including black, brown and light brown, buff, gray, gray-green, and greenish-brown.

Delaware chert from the central Ohio Delaware Formation is an exotic material in the Pennsylvania and West Virginia parts of the study area. The formation proper extends as a narrow ridge from Pickaway County, via Columbus, to the Sandusky vicinity on Lake Erie (Stout and Schoenlaub 1945:24). The chert occurs as nodules or imbedded bands with or without bedding planes. It is consistently described as bluish black or black with ostracod fossils (Stout and Schoenlaub 1945).

Fishpot/Redstone chert is from the Uniontown Formation Monongahela group in Jefferson County, Ohio. The chert type is often mistaken for either Uniontown chert or Monongahela chert (Eisert 1974).

Hughes River chert is a varietal of Brush Creek chert (Vento 1982:710) and is characterized as “buff, porous” (Vento 1982:710). Herbstritt (1981b) assigns the Hughes River variant to vitreous Brush Creek Limestone deposits found in Fayette County, Pennsylvania.

The term Huronian chert is used to describe distinctive pebble cherts available in Niagara and Erie counties in New York and Pennsylvania (Holland 1997). The chert is mottled white and gray with a caramel colored cortex.

The Kittatinny Supergroup and Kanawha black cherts have been recovered from sites throughout the study area. The black Kanawha cherts from the West Virginia Kanawha River valley area are noted in particular in Greene and Washington counties, Pennsylvania, artifact assemblages and less commonly north of the Pittsburgh area. Other black cherts may represent materials from the Kittatinny Supergroup of cherts as documented by Philip LaPorta (1994). This group is stratigraphically extremely complex with many individual varieties of chert represented.

Lockport chert is fossiliferous, a dark gray to bluish gray material with a dull luster. This variety has a cryptocrystalline structure with quartzitic veins. Fossil replacement is a common occurrence (Wray 1948). This variety may be found in Niagara County, New York, and Erie County, Pennsylvania.

Loyalhanna chert occurs as floatstone at 12 documented locations in Westmoreland County (Oshnock 2000). According to Oshnock (2000), the floatstone may be as large as 15 cm (6 in). The chert has a uniform gray color (5Y5/1) though under heat alteration it will range from 10R3/3 to 10R3/4 dusky reds. Its exterior color is sometimes expressed as reddish brown (5YR4/4). This exterior color is considered diagnostic by Oshnock (2000).

Monongahela chert is part of the Uniontown Formation. Eisert (1974) also notes that Monongahela group limestone runs along the Monongahela River and crops out in northern Washington County, southern Allegheny County, and in east Westmoreland County. Vento and Donahue (1982:119-120) characterize the rock as dark to light gray and interpret it "…as a secondary or replacement chert because of its lensoid and nodular distribution."

The most persistent of the exotic extralocal cherts are those originating in the Ohio Flint Ridge vicinity from the Vanport formation (Converse 1994; Granger 1988; Murphy 1989). These materials, commonly called both Vanport and Flint Ridge cherts, occur most consistently in study area Paleoindian and Terminal Archaic assemblages (Richard George, personal communication 2001).

Onondaga chert is perhaps the most common of the cherts. It is dark to light gray or dark bluish gray material with a mottled and streaked appearance and a somewhat lustrous texture. The chert may contain quartzitic or chalcedony filled veins. Its occurrence has been documented across upstate New York (Luedtke 1992) and it also occurs as glaciofluvial LPC in the study region and throughout northern Pennsylvania.

Prout chert (also known as Pipe Creek chert) is fossiliferous with small pyritic inclusions. Its color ranges from cream to tan and from light to dark gray (Vickery 1983). Prout chert is medium grained with a semi-vitreous texture and may be found in northeastern Ohio.

Plum Run chert occurs in lenticular form in northeastern Ohio (Luedtke 1992; Weed et al. 1994) and is common throughout the study region. Plum Run chert is dark gray to blue mottled and is fine grained and vitreous (Vickery 1983). Inclusions may consist of pyrite and carbonates (Stout and Schoenlaub 1945).

Sky Hill and Zaleski cherts are the same material. Sky Hill chert is reported by Cosgrove and Michael (1988:39) as a “dense, semi-vitreous to dull aranaceous black chert.” It was recovered from Site 36LR147, among others, and was being utilized during the Archaic occupation of that site.

Ten Mile chert is found along Ten Mile Creek in Greene County, Pennsylvania (East et al. 1996:105). The chert is variable in color and has been characterized as dark gray brown, olive brown or grayish blue.

Uniontown chert is found in the Paleozoic limestone outcropping of the Uniontown Formation. Sources of Uniontown chert are known to be present in the Little Chartiers Creek/Chartiers Creek vicinity, outcrops near Export in Westmoreland County, near Charleroi in Washington County, and along Chestnut Ridge in Fayette County (Eisert 1974:36-37). Eisert (1974:33) notes Uniontown chert exhibits an earthy to dull waxy luster. The Uniontown color grades are light to dark gray in addition to light olive gray (Geological Society of America [1991] Rock Color Chart [RCC] 5Y6/1), very pale orange (RCC 10YR8/2) and yellowish gray (RCC 5Y8/1) to dark yellowish brown (RCC 10YR4/2) and olive black (5Y2/1) (Eisert 1974:34).

Rather than lenses, Uniontown chert occurs in nodular form and the nodules range in size from 2.5 (1 in) to 30.5 cm (1 ft). Buker (1993:13) characterizes Uniontown chert slightly differently and describes it as "…brown, mottled brown, gray or buff material often riddled with impurities". He notes that "…a coarse-grained bluish gray variety with a dull red cortex…" also occurs in the Chartiers Creek valley (Eisert 1974:33.). This material is probably what Eisert (1974) refers to as blue flint.

Blue flint is recovered from the Chartiers Valley region on sites that also yield Uniontown chert artifacts (Eisert 1974:37-39). The so-called “blue flint” appears in collections from the Neill Site (36WH103) and the J.P. Martin Site (36WH101), in addition to the Ross Site (36WH271). Eisert (1974:39) believes that the material is related to Uniontown and coming from either the Uniontown or Pittsburgh formations.

Upper Mercer cherts developed in the Upper Mercer limestone of the Pottsville Formation. The stone occurs as both glaciofluvial pebbles and cobbles and at outcrops. The most consistently utilized outcrops occur in Coshocton and Muskingum counties in Ohio, but outcrops occur elsewhere in eastern Ohio and West Virginia (Davis 1988). The larger Upper Mercer limestone also encompasses both Cochocton and Vanport cherts.

Quartz is also known as quartz crystal and occurs throughout the eastern United States in secondary glacial deposits (Tankersley 1989). Glacial quartzite is metaquartzite and consists of recrystalized quartz grains (Tankersley 1989). The distribution of this material includes the glaciated regions of the eastern United States.

Rhyolite (metarhyolite) is a dense, fine-grained igneous extrusive rock composed of alkali, feldspar, and quartz (Kozarek n.d.). It comes in a variety of colors including dark gray, black, yellow, or grayish with purple overtones (Funk 1993). Extensive outcrops and

chipped stone quarries are documented in the South Mountain region of southcentral Pennsylvania, but the material is distributed across a large area of the Mid-Atlantic and Northeastern regions (Custer 1996). Rhyolite chipped stone items occur in low numbers in the Ohio River Valley proper. The raw material or chipped stone items appear to have reached Subbasin 20 from the reaches of Maryland and eastern Pennsylvania, across the Plateau divide and probably through Westmoreland County (George 1992b; George and Fischer 1999). This may be the same route used for the small number of ground steatite items reported in the region.

Modern Climate

Today, the climate of the area is classified as Humid Continental (SWPD 1983:10-11). Winter weather is dominated by a Canadian polar flow. At other times of the year and usually dictated by jet stream flow, air moisture enters the area from both the Gulf of Mexico and central Plains. Although tropical disturbances, including hurricanes, will occasionally impact the area, for the most part the prevailing air flow from the west ameliorates Atlantic Ocean influences. Moisture in the form of rain and snow falls year around and it ranges from "a minimum of 2.5 inches in February to a maximum of 4.2 inches in June" (SWPD 1983:11).

The temperatures average 50^{o} Fahrenheit annually and typically range from 29^{o} Fahrenheit in winter to 71^{o} Fahrenheit in summer. As anyone in the Pittsburgh vicinity will attest, however, temperature extremes commonly exceed the range and SWPD (1983:11) notes temperatures from 108^{o} Fahrenheit to -23^{o} Fahrenheit. From an agricultural perspective, one of the most important factors is the number of frost-free days; today within the subbasin this number ranges from 140 (in the north) to 150 days (in the south) (SWDP 1983:11).

Modern Floral and Faunal Communities

Braun (1950) characterizes the forests in this region as the most complex and longest established of the eastern United States (also Gordon 1969). Both the lowlands and uplands hosted pine, oak and hickory, pine and oak, oak and beech, and beech and hemlock segregates (Sears 1925). The riverine and swamp bottomlands also hosted more mesic species such as poplar, maple, and hemlock.

Two vegetation associations dominate in the area: maple-beech and mixed mesophytic. The former occupied reaches in the northern part of Subbasin 20 and extreme northeastern Ohio, while the latter holds sway south of the Wisconsin glacier front (Figure B4). The maple-beech association hosts white ash (*Fraxinum americana*), beech (*Fagus grandifolia*), black cherry (*Prunus serotina*), shagbark hickory (*Carya ovata*), sugar maple (*Acer saccharum*), and red and white oaks (*Quercus borealis* var. maxima and *Quercus alba*). Associated understory plants include two fruit varieties: wild grape (*Vitis aestivalis*) and paw-paw (*Asimina triloba*).

The mixed mesophytic forest by definition is without dominants and is one of the most widespread of the forest associations defined by Braun (1950). As Gordon (1969:52) notes, however, segregates such as hemlock-beech, oak-hickory, oak-chestnut, and chestnut oak-chestnut-yellow poplar can be pulled from the mixed mesophytic landscape mosaic. The hemlock-beech forest was the most open of the listed segregates. The forest was marked by the presence of beech and hemlock (*Tsuga canadensis*) usually accompanied with a low count understory comprised of species such as hobblebush (*Viburuum aluifolium*), partridge berry (*Mitchella repens*), Canada mayflower (*Maianthemum canadense*), true wood sorrel (*Oxalis montana*), and American yew (*Taxus americana*).

These forest types supported a variety of animal populations. Larger mammalian species that are known to have been present in the historic period include black bear (*Euarctos americanus*), white-tailed deer (*Odocoileus virginianus*), and American elk (*Cervus canadensis*). Mid-sized and small mammals located all the segregates included beaver (*Castor canadensis*); bobcat (*Lynx rufus*); gray (*Urocyon cinereoargenteus*) and red (*Vulpes fulva*) fox; muskrat (*Ondatra zibethica*); opossum (*Didelphis marsupialis*); otter (*Lutra canadensis*); porcupine (*Ezethizon dorsatum*); eastern cottontail rabbit (*Sylvilagus floridanus*); raccoon (*Procyon lotor*); both eastern spotted (*Spilogale putorius*) and striped (*Mephitis mephitis*) skunks; eastern gray (*Sciurus carolinenis*), fox (*Sciurus niger*) and red (*Tamiasciurus hudsonicus*) squirrels; and woodchuck (*Marmota monax*).

Western Pennsylvania is on a major flyway and bird species include both indigenous and migratory varieties. Of particular importance are and were the so-called game species including wild turkey (*Meleagris gallopavo*) and seasonal overflights of species such as Canada goose (*Branta canadensis*) and the now-extinct passenger pigeon (*Ectopistes migratorius*). Various duck including *Anas* spp., American widgeon (*Mareca americana*), wood duck (*Aix sponsa*), and canvas back (*Aythya valisneria*) also are and were present in the region.

Finally, aquatic species were, and to some degree are, abundant in the subbasin. Cold water fisheries are restricted to the northern upper elevations in Lawrence County (SWPD 1983). In the lower elevations, warm water fisheries are present throughout the study region.

Holocene Environment

Between about 15,000 and 10,000 B.P. glacial advances and retreats marked the waning days of the Laurentide glacial sheet across the upper expanses of the study area (Watts 1983; see Figure B4). The interglacials during this period had set the stages for the grassland/forestland mosaics that would soon envelop the lands bared by the retreated ice (Cotter 1983; Dent and Kauffman 1985; Watts 1983). The environmental reconstruction based on macrofossils and pollen at Crider's Pond, Longswamp, Buckle's Bog, and Corry Bog indicate that nonarboreal pollen (NAP) from various grass species dominated during each glacial advance and NAP significantly diminished with each retreat. During the retreat intervals or in locations along the glacial margin, spruce (*Picea* sp.), fir (*Abies* spp.), jack and pitch pines (*Pinus bansiana* and *Pinus rigida*), and gray birch (*Betula populifolia*) formed mast colonies on grass dominated plains (Maxwell and Davis 1972; Watts 1983).

Once the last Wisconsin glacier retreated northward out of the study region by 10,000 B.P., a concomitant northward migration of flora and fauna followed the recession of the ice. The southern front of the Southern New York Section physiographic zone loosely follows the extent of the Wisconsin glacial advance (Adovasio 1983; Knepper and Petraglia 1993; Vento et al. 2002). South of the margin edge, ice free landscapes were present prior to classically defined Paleoindian times (Adovasio 1983). Others (Kauffman and Dent 1982), using different data, have reached substantively the same conclusion as Adovasio et al. (1998) that biological evidence suggest that environmental conditions similar to those today were in place by Paleoindian times. This does not mean that microclimatic events did not occur; rather, conditions were appropriate for species found today to have lived during Paleoindian times in about the same settings.

Braun (1950), Carbone (1976), Dent and Kauffman (1985), Guilday (1967), and Kauffman and Dent (1982) provide reconstructions of the immediate post-Pleistocene environment based on pollen, floral macrofossils, and faunal assemblages from various contexts. Braun (1950) provides a baseline description of the nut-bearing tree groupings covering the study region by Paleoindian times. The northern counties, and the higher elevations in southern Allegheny and Beaver counties, supported the Hemlock-White Pine-Northern Hardwoods Forest type community. This biome covered the region from northern Minnesota and southern Manitoba eastward through the upper Great Lakes, across southern Canada, most of New York, northern Pennsylvania, and most of New England. Braun (1950) characterizes the biome as marked by the "pronounced alternation of deciduous, coniferous, and mixed forest communities." Community composition varied with local conditions, but included both deciduous and coniferous elements.

Following the glacial retreat, a second biome, the Oak-Chestnut Forest (Braun 1950), was present across the southern study area and was beginning to encroach into the northern valleys. The composition of the Oak-Chestnut Forest included local variants such as oak-hickory, oak-chestnut, mixed mesophytic, and hemlock-hardwoods communities. These are typified by combinations of several species of oak (white, black, chestnut, and red oak), together with chestnut, beech, hickory, and tuliptree, as well as sugar maple, sweet birch, hemlock, white ash, basswood, black cherry and others in lesser numbers (Braun 1950).

As noted by Davis (1969), the forest development was a slow process for both the Hemlock-White Pine-Northern Hardwoods and Oak-Chestnut forest types. Within about 2500 years of the final glacial retreat, however, most elements of both types were in place though neither had reached their full horizontal extent (Davis 1969; Vento and Rollins 1989).

The waning eons of the Pleistocene era coincided with the gradual demise of the now-extinct megafauna and the expansion northward of still extant, temperate climate mega- and microvertebrates. As was the case with the forest expansion, the faunal population were gradually displaced and replaced in the post-glacial period. For example, the microvertebrate population recovered from the 11,300 B.P. level in Unit B at New Paris Sinkhole No. 4, Bedford County, Pennsylvania (Guilday et al. 1964), is marked by the presence of boreal species. The species included arctic shrew (*Sorex arcticus*), collared lemming (*Docrostonyx*

hudsonius), northern bog lemming (*Synatopmys borealis*), and yellowed cheeked vole (*Microtus xanthognathus*). The vertebrate assemblage from the 9290 B.P. level at Hosterman's Pit, Centre County, Pennsylvania, however, lacked all these species and was clearly temperate in composition (Guilday 1967).

Both of Braun's (1950) forest types were capable of supporting a variety of animal populations. Mammalian species that would have abounded and which would have been important to aboriginal hunters include white-tailed deer, elk, black bear, raccoon, groundhog, beaver, gray squirrel, and muskrat. Skeletal remains of all these species have been recovered from Archaic sites, from Meadowcroft Rockshelter, and from non-cultural contexts in the region (Adovasio 1983; Adovasio et al. 1975; Adovasio et al. 1998; Funk 1993). Most of the modern avian and aquatic species also were present.

The investigations at Meadowcroft recovered over 100,000 bone elements representing 151 vertebrate taxa and 149 species. About 93 percent of the elements were recovered from avian pellets. The pellet subassemblage was dominated by three species that collectively represented 68 percent of the total. These were southern flying squirrel (*Galucomys volans*), passenger pigeon, and toad (*Bufo* spp.). The three dominant species were present in pellets dating from Paleoindian through the Woodland occupations in the rockshelter. As the toad, in particular, is sensitive to climatic and conditional changes, its presence throughout the temporal span of the occupations was of particular note.

The only other faunal recovery from a Paleoindian context in the greater region was the fish bone recovered at Shawnee Minisink (McNett 1985). The tools assemblages recovered from the Paleoindian levels at Shawnee Minisink, however, include side- and end-scrapers, flake knives, and hammerstones. The presence of these tools suggests that the number of species exploited may have been greater than just fish.

Even though the continuous occupation of the Northeast and Midwest from Paleoindian through Archaic times is supported by evidence from a diverse grouping of stratified sites (Broyles 1971; Fowler 1959), Prufer and Long (1986) noted that an occupational hiatus might have existed in the eastern Great Lakes region, including western New York, northwestern Pennsylvania, and northeastern Ohio. Cowin (1991) discounted this argument and, as also concluded by Funk (1976), stressed that microclimatic conditions could have allowed for the uninterrupted use of western Pennsylvania, including the northwestern quadrant, through the time period under discussion. Even if transitional Paleoindian and Early Archaic post-glacial climatic factors forestalled occupation in upstate New York and the interior of New England, Early and Middle Archaic utilization of several topographic settings was occurring in the Appalachian Plateau of Ohio, Pennsylvania, New York, and West Virginia by 7000 to 5000 B.C.

The Meadowcroft Rockshelter (Site 36WH297) data support the conclusion that climatic conditions were much the same throughout the duration of the Paleoindian and Archaic stage (Adovasio et al. 1998; also, Cowin 1991; East et al. 1996). As noted by Koetje (1998:35) of the conditions extant at Site 36ME105 during its Early Archaic occupation, “it

seems reasonable to suppose that at 36ME105 we are sampling a portion of a relatively mobile subsistence system based on an essentially modern, post-Pleistocene flora and fauna."

Environmentally, the hallmark event of the Middle Archaic is the Atlantic Episode Hypsithermal climatic event. The Holocene climate experienced a gradual amelioration from Early Archaic times to the present day. There have been significant periods of climatic fluctuation, however, during this era and two of the more marked are the prehistoric Hypsithermal (Middle Archaic) and the Pacific Climatic Episode (Late Woodland / Late Prehistoric). The Hypsithermal was a period of warming in combination with decreased rainfall while the Pacific Climatic Episode is a cool period with fewer than 140 frost-free days.

The Hypsithermal occurred during the second half of the Middle Archaic. For many years, researchers assumed that Hypsithermal conditions significantly impacted resource availability. The diminished resource base supposedly led to the wholesale abandonment of the region. Subsequent investigations have yielded data suggesting that the interpretation was significantly flawed. Rather than abandonment, the population remained in the region though it did not seem to grow in numbers significantly (based solely on component numbers) (Neusius 1986; Reinhart and Hodges 1990).

The projectile point styles of the period suggest that there was a continuing reliance on large game animals. Floral recovery at the Zawatski Site in the upper Allegheny River drainage documents the use of both butternut and black walnut. *Quercus* spp. (oak) also appears at Zawatski and at Meadowcroft Rockshelter (36WH297) (Carlisle and Adovasio 1982; Miller 1977). And, at Sandts Eddy (36NM12), there appears to have been at least a short-term use of hazelnut during the period (Bergman et al. 1994b). The presence of all four of these tree species, and their associated nuts, indicates that the climatic conditions were amenable enough to continue to support this forest cover.

In addition, intensive utilization of single species seems to begin in the Middle Archaic in certain geographic areas. This exclusionary pattern includes shellfish in the interior rivers of Tennessee, along the Hudson River in New York, and in New England in general. Also included are biannual fish and eel harvests along Northeast rivers including the Susquehanna and Delaware rivers (Bergman et al. 1994a, 1994b; Funk 1991). The burned rock assemblages from the Jacobs Site (36LU90) were interpreted as remnants resulting from eel processing during the Late and Terminal Archaic (Weed and Wenstrom 1992); the New England data support the beginnings of this during the Middle Archaic (Dincauze 1971).

There is no significant climatic change in the Late Archaic and Terminal Archaic periods in the study area. The environmental conditions in the study area are similar to those established at the end of the Middle Archaic Hypsithermal cycle. Charcoal, nutshell, and pollen recovery from sites in the region indicate that a basic suite of plants is present from the Late Archaic through at least the Middle Woodland periods.

Table 3.5 lists the composition of the ethnobotanical samples recovered from features at the Connoquenessing Site (36BV292) within Subbasin watershed 20C (Knepper et al. 1993:226-230). On the table, the parenthetical initials following each feature number refers to the temporal period of the feature (LA-TA = Late/Terminal Archaic; LA = Late Archaic; TA = Terminal Archaic; MW = Middle Woodland). The recovered items suggest that the oak/hickory complex established during the Early Archaic continues to hold sway into the Middle Woodland. Certainly, purposeful selection of certain wood types may be culturally dictated, but the presence of wood charcoal from these species also suggests that the types were readily available.

The forest and understory communities present during the Woodland stage (1000 B.C. to A.D. 1600) are assumed to be quite similar to those present at the time of European contact (Zawacki and Hausfater 1969). This assumption is supported by the results of investigations at Meadowcroft Rockshelter (36WH297) for the Early Woodland (Carlisle and Adovasio 1982), by Yarnell (1973) at various environmental testing locations, and by Schuldenrein et al. (1991) at Lower Black's Eddy (36BU23) in eastern Pennsylvania. The only significant change in environmental conditions within the stage occurs late in the Late Woodland / Late Prehistoric period. A period of increased cold, not related to the Little Ice Age in the 1800s, occurs between about A.D. 1250 and 1400. This period of climatic deterioration, referred to as the Pacific Climatic Episode (Nass and Hart 2000), may have effected Monongahela site settlement decisions in the middle and late Monongahela eras (Johnson et al. 1989) though Nass and Hart (2000) argue against a severe, debilitating effect.

The Middle Woodland environment is unchanged from that of the preceding Early Woodland (Nass and Hart 2000). There are no data to indicate any departure from a relatively stable climatic situation throughout the period. Nass and Hart (2000) present a short but comprehensive discussion of the Late Woodland / Late Prehistoric environment. While the environment through the early and middle years of the period is a continuation of the stable conditions in place since the Middle Archaic, by about A.D. 1250 the aforementioned Pacific Climatic Episode has begun. This deterioration coincides with a short-term cooling trend that results in less than 140 frost-free growing days across much of the region. Johnson et al. (1989) and Nass and Hart (2000) argue with varying degrees of vehemence that this period of climatic instability directly results in Monongahela coalescence especially in protected loci where microclimatic conditions result in 140 or days of frost free conditions. This argument would do much to explain the changes in Monongahela settlement patterns that appear to occur in the middle and late Monongahela phases. However, nearby culture groups do not respond in similar ways and Nass and Hart (2000) believe that the climatic shift cannot fully account for the changes.

Table 3.5. Ethnobotanical Recovery from Features at Site 36BV292

Sample: Scientific Name	Common Name	F43 (MA-LA)	F51 (LA)	F34 (TA)	F54 (TA)	F13 (MW)	F48 (MW)	F52 (MW)	F53 (MW)
Charcoal: Carya	Hickory	x	x	x		x	x	x	x
Charcoal: Quercus	Oak	x	x	x	x	x		x	x
Charcoal:Carpinus	Hornbeam						x		x
Charcoal:Juglandaceae	walnut/hickory					x	x		
Charcoal:Pinus	Pine								x
Charred:Chenopodium	goosefoot					x	x		
Nutshell: Carya	Hickory		x				x	x	x
Nutshell: Juglans cinera	Butternut		x						
Nutshell: Juglans nigra	walnut, black		x						
Pollen: Carya	Hickory			x	x				
Pollen:Alnus	Alder								x
Pollen:Asteracea, high spine	Sunflower	x		x	x	x			x
Pollen:Asteracea, low spine	Ragweed	x		x	x	x			x
Pollen:Betula	Birch				x				x
Pollen:Caryophyllacea	Pink	x		x	x				
Pollen:Castanea	Chestnut					x			
Pollen:Cheno-ams	goosefoot, pigweed	x		x		x			x
Pollen:Cyperaceae	Sedge			x	x	x			
Pollen:Liguliflorae Asteraceae	Dandelion				x				
Pollen:Nyctaginaceae	four o'clock			x					x
Pollen:Nyssa	Tupelo			x					
Pollen:Pinus	Pine					x			x
Pollen:Poacea	Grass	x		x	x	x			x
Pollen:Quercus	Oak	x		x	x	x			x
Pollen:Roasceae	Rose				x				
Pollen:Smilax	Greenbriar			x					
Pollen:Solanaceae	potato/tomato family					x			
Seed:Diospyros	Persimmon					x			
Seed:Vitaceae	grape family								x

Research Issues

The questions developed in the research design for this topic will be addressed, for the most part, by the results of the current excavations being conducted at the site. It was noted in the research design that "it is important to compare the information [from] 36AL480 with the information available from other site excavations within various regions (southwestern Pennsylvania, Upper Ohio Valley, Appalachian Plateau, Pennsylvania, and Eastern [sic] United States)" (U.S. Army Corps of Engineers n.d.:18).

In the preceding discussions, data pertinent to the regional environment has been presented. The current data set more than adequately addresses the broader issues of climatic change from Paleoindian through Woodland times. Available data, except in the earliest periods, also provide a solid overview of exploited species. At specific sites, there has been equally solid work directed to isolating the subsistence patterns for specific occupations. Thus, for Leetsdale, the emphasis in data acquisition was on the thorough documentation of the microenvironmental conditions at the site during its periods as an island and as a part of the mainland. Further, as the three data recovery excavation areas were opened and multiple examples of occupations dating to the same periods revealed, a comparison of the different adaptive responses by time period apparently was conducted. On a broad level, it is likely the same species were exploited, for example, by all Late Archaic occupants. However, determining how each successive prehistoric group of occupants at the site approached the treatment of the specific species should provide invaluable insight into the variability of exploitation techniques on a common landform by cultural groups.

PREVIOUS ARCHAEOLOGICAL STUDIES

The following section is organized into three major subsections that deal with the electronic databases, literature, collections reviews, and interviews.

Ohio and Pennsylvania Databases

The combined Ohio and Pennsylvania databases contain information on 6467 resources or components (Table 3.6). Because of differences in the database structures, the resources in the PASS (Subbasin 20) database represent individual site components while the resources in the OHPO (Leetsdale) data represent individual sites. These differences are reflected in Table 3.6 below. For the general comparison discussed herein, no attempt was made to convert the Ohio sites to components. However, in subsequent discussions focused on the prehistoric-only information, a conversion to components was made.

Table 3.6. Temporal Sites (Ohio) and Components (Pennsylvania) in the Study Area Databases					
State, County	**Sites and Components**				**Total by County**
	Prehistoric	**Prehistoric/ Historic**	**Historic**	**Unknown**	
OH, Ashtabula	88	19	21	6	134
OH, Belmont	146	18	51	17	232
OH, Columbiana	274	39	109	10	432
OH, Jefferson	81	7	15	9	112
OH, Mahoning	81	10	38	21	150
OH, Monroe	15	2	26	24	67
OH, Trumbull	131	8	40	13	192
PA, Allegheny	297		48	15	360
PA, Beaver	740	1	49	8	798
PA, Butler	450		81	6	537
PA, Crawford	276		10	2	288
PA, Greene	100	1			101
PA, Lawrence	364	2	49	14	429
PA, Mercer	401	1	24	3	429
PA, Washington	2079	3	103	21	2206
Total	**5523**	**111**	**664**	**169**	**6467**

Turning attention to the databases, there are a total of 5792 prehistoric components (Table 3.7). Of this number, however, 46.2 percent (n=2678) of the components are classified only as Prehistoric and another 22.1 percent (n=1283) are classified only as either Woodland or Archaic. Both ends of the temporal spectrum appear to be underrepresented in the sample. The Protohistoric, Historic Contact, and Historic period aboriginal samples are small and most of the components occur on sites in the Ohio sample counties. Similarly, the Paleoindian sample, including the transitional late Paleoindian to Early Archaic components, is small though more robust than might be first thought. Many of the Paleoindian assignments, however, are based on diagnostics recovered as isolates or as possible curios on sites with multiple later components.

While at first glance the Pennsylvania sample seems more robust than the Ohio sample, part of this is due to the assignment of temporal period based on the presence of diagnostic projectile points listed in the PASS (Subbasin 20) database. This was completed purposely in order to glean as much usable temporal information as possible from the database. Thus, in several instances, the original component assignment was, for example, general Archaic, but the presence of a Koens-Crispin point was extrapolated to change the component to Late Archaic/Terminal Archaic. Table 3.8 lists the original component(s) assigned in the Pennsylvania database, the final assignment, and the projectile points used to make the adjustment or addition.

Table 3.7. Prehistoric and Early Historic Components by State			
Component	**Ohio**	**Pennsylvania**	**Totals for Both States by Component**
Historic aboriginal	18		18
Contact historic		5	5
Protohistoric		3	3
Late Prehistoric	39		39
Late Woodland, Late Prehistoric		118	118
Late Woodland	54	154	208
Middle Woodland	13	255	268
Early Woodland	46	234	280
Woodland, general	64	471	535
Terminal Archaic, Early Woodland		17	17
Terminal Archaic		43	43
Late Archaic	93	317	410
Middle Archaic	13	128	141
Early Archaic, Middle Archaic		113	113
Early Archaic	3	79	82
Archaic, general	73	675	748
Terminal Paleoindian, Early Archaic		2	2
Late Paleoindian		5	5
Middle Paleoindian		3	3
Paleoindian	33	43	76
Prehistoric, general	628	2050	2678
Total	**1077**	**4715**	**5792**

Table 3.8. Projectile Points Used to Adjust Temporal Assignments in the PaBHP PASS (Subbasin 20) Study Area Database		
Original Temporal Assignment	**Adjusted Temporal Assignment**	**Adjustment Based on Following Projectile Point(s)**
Woodland, general	Late Archaic	Steubenville/Fox Creek
Woodland, general	Early Woodland	Adena (stemmed) Meadowwood
Woodland, general	Middle Woodland	Snyders
Woodland, general	Middle Woodland	Raccoon Notched
Woodland, general	Late Woodland and Late Prehistoric	Triangles
Archaic, general	Terminal Archaic to Early Woodland	Perkiomen
Archaic, general	Late Archaic and Terminal Archaic	Steubenville/Fox Creek Koens Crispin/Savannah River Lehigh/Snook Kill
Archaic, general	Early Archaic to Middle Archaic	Bifurcates
Archaic, general	Early Archaic	Kirk, Palmer
Paleoindian, general	late Paleoindian	Late Paleo (Plano)
Paleoindian, general	middle Paleoindian	Mid-Paleo (Folsom)
Paleoindian, general	late Paleoindian to Early Archaic	Hardaway-Dalton

An examination of the actual site forms and reports indicate that many of the components are based exclusively on the presence of a single diagnostic from the stated time period. In the absence of systematic excavation, it is virtually impossible to determine if the diagnostics recovered from a given site actually represent an occupation or merely a passing foray. In either case, this study assumes that the presence of a diagnostic from a given time period implies site use by people of that cultural period.

Archaeological Research Reports

Two groups of sites were subjected to particular attention during the course of the context study. The first group of sites was comprised of those where Phase II and/or III investigations had been completed and reported. This set includes sites both within Subbasin 20 and in the larger study region. Initially, these sites were to be restricted to resources found on flood plain or terrace landforms. The samples, however, were so small that the research was expanded to include selected Phase II and III sites in all settings within the subbasin and a selected sample of sites in the target topographic settings outside of the subbasin.

The second set of sites was comprised of those chosen by Gray & Pape and the District for collection review. This 16-site sample included previously unreported collections and collections from previously reported sites that had been subjected to various levels of investigation. The various sets of sites are discussed below.

Subbasin 20 Phase II and III Sample Sites

The Subbasin 20 Phase II and III sites in the report sample are listed below in Table 3.9. Each of the sites is briefly discussed after the table.

Table 3.9 Subbasin 20 Phase II and Phase III Site Reports Reviewed in the Study Sample

Subbasin and Watershed	Site No.	Site Name	Site Type	Topographic Setting	Chronology (all phases of work)	References
20C	36BV292	Connoquenessing Site	Open habitation	Terrace	Early Archaic; Late Archaic through Late Woodland	Knepper and Petraglia 1993
20D	36BV29	Georgetown Site	Open habitation	Floodplain	Early Woodland, Middle Woodland	Davis and Lantz 1987
20D	36BV240	Dravo #1 Site	Open habitation	Terrace	Early Woodland, Middle Woodland	Davis and Lantz 1987; Davis 1988
20D	36WH297	Meadowcroft Rockshelter	Rock Shelter/ Cave	Terrace	Paleoindian, all Archaic periods, all Woodland periods	Adovasio et al. 1975: 1-30; Carlisle and Adovasio 1982

Table 3.9 Subbasin 20 Phase II and Phase III Site Reports Reviewed in the Study Sample (continued)						
Subbasin and Watershed	**Site No.**	**Site Name**	**Site Type**	**Topographic Setting**	**Chronology (all phases of work)**	**References**
20F	36AL6	McKees Rock Mound	Earthwork	Rise in Floodplain	Late Archaic, Early Woodland, Middle Woodland, Late Woodland / Late Prehistoric	Dragoo 1963: 153-158; Mayer-Oakes 1955: 130, 139, 141, 145-153
20F	36AL40	Portman Site	Open habitation	Floodplain	Archaic, Early Woodland, Middle Woodland, Late Woodland / Late Prehistoric	Buker 1993: 7-52
20F	36AL62	Drew Site	Village	Hill Ridge/ Toe	Late Archaic, Early Woodland, Middle Woodland, Late Woodland / Late Prehistoric	Buker 1970: 21-66; Tanner 1970: 66-68
20F	36AL124	Mayview Bend Site	Open habitation	Floodplain	Archaic, Early Woodland, Late Woodland / Late Prehistoric	Benedict and Kingsley 1995; Kingsley 1995
20F	36AL125	Mayview Depot Site	Open habitation	Floodplain	Archaic, Late Woodland / Late Prehistoric	Benedict and Kingsley 1995; Kingsley 1995
20F	36WH276	Meadows Mound	Burial mound	Stream Bench	Early Woodland	Maurer 1975: 45-56
20G	36AL386	Leets #1	Open habitation	Terrace	Late Archaic, Early Woodland	Davis 1998
20G	36AL387	Leets #2	Open habitation	Terrace	Late Archaic, Early Woodland	Davis 1998
20G	36AL480	Cinque Site (Leetsdale)	Open habitation	Floodplain, Terrace	Early Archaic, Middle Archaic, Late Archaic, Terminal Archaic, Middle Woodland	Davis 2000; Hardlines Design Company 2000

Site 36BV292 (the Connoquenessing Site) is an upland, open habitation site. The site was identified and subsequently subjected to Phase III investigations as part of a transmission line project. The site investigations revealed extensive feature remains. The primary occupations at the site date from the Late Archaic through Late Woodland periods though Early Archaic LeCroy points also were recovered. The site report presents detailed information on all phases of the work at the site and has a particularly useful ethnobotanical summary. The ethnobotanical data from the site are summarized herein on Table 3.5. The features yielding ethnobotanical remains were assigned to the Late Archaic, Late/Terminal Archaic, Terminal Archaic, and Middle Woodland occupations of the site.

Sites 36BV29 (the Georgetown Site) and 36BV240 (the Dravo #1 Site) are located on the lower and upper terraces of the Ohio River. Both sites are classified in the PASS database as open, habitation sites. Both sites were investigated as part of a salvage operation prior to use of the site areas for gravel operations. Site 36BV29 (the Georgetown Site) appears to be the larger of the two sites and Davis (1988) interprets Site 36BV240 (the Dravo #1 Site) as a satellite of it. The site components include miscellaneous Archaic materials and both artifacts and features dating to the Early Woodland and Middle Woodland periods.

Site 36WH297 is the Meadowcroft Rockshelter. The site is located on the valley wall above Cross Creek. The controlled, detailed investigation of the shelter habitation site was conducted between 1973 and 1975. During the course of the investigations, 11 natural strata were defined and cultural remains were recovered within all but the deepest (Stratum I). Beginning with a Paleoindian occupation in Stratum IIa, the subsequent occupations included Late and Terminal Archaic (Strata IIb and III), Terminal Archaic/Early Woodland (Stratum IV), Early/Middle Woodland (Strata V and VI), and Late Woodland (Strata VII through XI). Cultural features were found to be associated with each primary occupation level. A full array of artifact classes also was recovered.

Site 36AL6 is a mound site located "on a promontory overlooking the junction of Chartiers Creek with the Ohio River" (Dragoo 1963:153). It was partially excavated in 1896 by the Carnegie Museum. This fieldwork cut the mound, revealing evidence for three building episodes, and recovered at least 33 burials. Subsequent analysis of elements of the collection suggested that the mound was built on earlier Archaic occupation zones. The mound(s) are Early Woodland Adena in affiliation. The chipped stone collection for the site was examined for this current study.

Site 36AL40 is an open, multi-component habitation site located on a bottomland terrace of Chartiers Creek. The site was investigated by the Carnegie Museum in 1968-1969 (Buker 1993:7). The site subsequently was destroyed during building construction. Although the site was initially thought to be a single component Late Prehistoric village, the excavations recovered evidence of Archaic transient campsites in addition to Early Woodland, Middle Woodland, and Late Woodland / Late Prehistoric occupations. At Site 36AL40, sections of at least two palisades were isolated in addition to a path, houses, various refuse and storage pits, and hearths (see Appendix J for feature summary). The artifact assemblage included the typical suite of chipped, ground, and pecked stone; Woodland ceramics; and a nice array of both bone and antler items. Subsistence items in the form of both faunal and floral specimens also were recovered. Three absolute dates were obtained and pinpoint occupations dating to the Middle Woodland and Late Woodland / Late Prehistoric periods (Appendix E; Buker 1993:45).

Site 36AL62, another multi-component open habitation site, was located on the T-1 terrace of Chartiers Creek. The site was destroyed during the construction of Interstate 79. This site is the type site for the Late Woodland Monongahela Drew phase. Evidence of Archaic, Early Woodland, and Middle Woodland occupations also were found at the site. The primary occupation is marked by the presence of postmolds, in addition to "…refuse, fire, and storage pits" (Buker 1970:28-29). The artifact assemblage include chipped and

ground stone in addition to ceramics, antler, bone, and shell tools and items. The chipped stone collection from the site was examined for this current study.

Sites 36AL124 and 36AL125, both open, habitation sites, were identified during a wetlands replacement project for the Pennsylvania Department of Transportation. Site 36AL124 (Mayview Bend Site) was found on the current T-2 terrace of Chartiers Creek; Site 36AL125 (Mayview Depot Site) was identified on the adjacent T-1 terrace. Site 36AL124 (the Mayview Bend Site) is a plowzone site with features present at the plowzone/B horizon interface. The site dates to the Early and Middle Woodland periods. Site 36AL125 (the Mayview Depot Site) is stratified and contains evidence of both Archaic and Woodland occupations. The reported feature data from both sites are summarized in Appendix J of this report. The collection from Site 36AL124 was examined for this current study as the collection from Site 36AL125 in repository at PHMC was not released for study because of cataloguing issues.

Site 36WH276 (Meadows Mound) is located on a Chartiers Creek terrace at the base of a hill. Members of the Society for Pennsylvania Archaeology Paul R. Stewart Chapter completed excavations into the burial mound remnants. The mound dates to the Early Woodland and is of Adena affiliation. The excavations revealed 26 features of various types and a small assortment of chipped and ground stone artifacts. "No pottery, copper, or mineral matter other than red ocher were found" (Maurer 1975:53).

Sites 36AL386 (Leets #1) and 36AL387 (Leets #2) were located on the second and third terraces above the Ohio River and immediately south of Site 36AL480 within the Leetsdale Industrial complex. The sites are identified as stratified Late Archaic and Early Woodland locations (Davis 1998). Features were isolated at both sites and these are summarized in Appendix J. Though the artifact assemblages were not particularly large, they did include both chipped stone and ground stone items.

Site 36AL480, the Project site, is located on the T-1, T-2, and T-3 terraces of the Ohio River (Vento et al. 2002). The site was subjected to Phase I and interrupted Phase II investigations by Davis in late 1999 (Davis 2000). The work to that point had identified stratified deposits to a confirmed depth of about 2 m (6.6 ft) below present ground surface. In addition, features and occupational floors also were identified. The Phase I/II collection resulting from the Davis 1999 excavations was examined for this current study.

Outside Subbasin 20 UOV Phase II and III Sample Sites

The subbasins adjacent to Subbasin 20 in Pennsylvania are 16 (Upper Allegheny), 17 (Central Allegheny), 18 (Lower Allegheny), and 19 (Monongahela). Site reports dealing with resources in these subbasins were reviewed and those listed on Table 3.10 below were included in the Phase II and III sample sites. Also, site reports from Ohio and West Virginia resources in the UOV also were included in the sample (Table 3.10).

Table 3.10 Outside Subbasin 20 UOV Phase II and Phase III Site Reports Reviewed in the Study Sample						
Subbasin and Watershed	**Site No.**	**Site Name**	**Site Type**	**Topographic Setting**	**Chronology (all phases of work)**	**References**
Ohio, no watershed data	33BL37	Pearsall Site	Open artifact scatter	Terrace	Early Woodland	Immel et al. 1981
17C	36AL134	Fishbasket	Open habitation	Terrace	Minor Archaic and Early and Middle Woodland components; Late Woodland / Late Prehistoric	Burkett 1999
17C	36CL93	Fishbasket North	Open habitation	Terrace	Minor Archaic and Early and Middle Woodland components; Late Woodland / Late Prehistoric	Burkett 1999
18A	36AL19	Blawnox	Open habitation	Floodplain	Middle Woodland, Late Woodland / Late Prehistoric	George 1982
19C	36AL375	Scenery Hill I	Open habitation	Upland bench	Late Archaic, Terminal Archaic	East et al. 1996
19C	36FA34	Novak Site	Village	Upland saddle	Late Woodland / Late Prehistoric	Boyce 1985: 21-49
19C	36WH737	Mon City Site	Open habitation	Terrace	Late Woodland / Late Prehistoric	Church 1994: 40-53; Hart 1994: 3-39
19D	36AL285	Thorpe Site	Open habitation	Upland bench	Early Woodland, Late Woodland / Late Prehistoric	George 1998
19D	36FA40	Howarth-Nelson Site	Village	Upland saddle	Late Woodland / Late Prehistoric, Protohistoric	Adovasio et al. 1990: 32-68
19D	36WM61	Household Site	Village	Terrace	Late Woodland / Late Prehistoric	George et al. 1990: 40-70
West Virginia, no watershed data	46BR31	East Steubenville Site	Open habitation	Ridge top	Late Archaic (Panhandle Archaic)	Lawrence 1999: 21-28; Mayer-Oakes 1955: 130-138
West Virginia, no watershed data	46MR95	Saddle Site	Open habitation	Ridge toe	Late Woodland / Late Prehistoric	Church and McDaniel 1992
West Virginia, no watershed data	46MR96	Bluebird Site	Open habitation	Terrace	Middle Woodland	Stevenson et al. 1991
West Virginia, no watershed data	46MR114	Roadside Park Site	Open artifact scatter	Terrace	Late Archaic, Early Woodland, Middle Woodland	Gundy et al. 2000; Skelly and Loy, Inc. 2001
West Virginia, no watershed data	46WZ45 (Site 10A)	Pleasantview Site	Open campsite	Ridge top	Late Archaic	Ballweber 1993

Site 33BL37 (the Pearsall Site) is representative of small, open artifact scatters with associated features common to the Ohio portion of the study area. The sites in this class probably originally functioned as camps. The site was investigated as part of a salvage operation in the early 1980s (Immel et al. 1981). The site's features are restricted to hearths, and the artifact diagnostics indicate Early Woodland use of the site area.

Sites 36AR134 (Fishbasket) and 36CL93 (Fishbasket North) are located on primary terraces south of the confluence of Redbank Creek with Town Run (Burkett 1999). Both sites are classified as open habitation loci. The area of the two sites was known historically to have hosted Native American villages. The site areas were to be impacted by a municipal sewage treatment plant and were subjected to systematic excavation by Society for Pennsylvania Archaeology local chapter members. Based on these excavations, primary occupations dating to the Late Woodland were isolated. The sites also yielded evidence of earlier Archaic and Woodland uses.

Site 36AL19 (Blawnox) is an open habitation site located on the primary flood plain of the Allegheny River. A large portion of the site was destroyed about 1956 by industrial development. In 1979-1980 salvage archaeology was undertaken on the remaining portion of the site. This last segment was subsequently destroyed. The site had identified Middle Woodland and Late Woodland Monongahela components. George (1982) details the results of the excavations conducted in 1979-1980 which were concentrated in the Middle Woodland portion of the site. Though Late Prehistoric items also were recovered, George (1982:186) attributes most of the features to the Middle Woodland occupations; one historic feature also was identified.

Site 36AL375 (Scenery Hill 1) is an upland, open habitation site identified during the MON/Fayette Transportation project. The combined Phase I/II excavations at the site resulted in the recovery of 9,456 chipped stone items and two pitted stone. In addition, one disturbed feature also was identified (East et al. 1996:3). Aspects of the chipped stone assemblage, including the presence of Steubenville Variant projectile points, led researchers to classify the site as a Panhandle Archaic variant as Steubenville points are hallmarks of that phase. The site was subjected to Phase III data recovery in 1995. During these investigations, 11 cultural features and 20,539 chipped stone items were recovered. Radiocarbon dates from the site place the primary occupation in the Terminal Archaic (East et al. 1996:3) though an earlier Late Archaic occupation may be present as well.

Site 36FA34 (the Novak Site) is located in a saddle on a ridge line between an intermittent drainage and an upland valley. The site, assigned to the Late Woodland, is a Monongahela village. It was originally identified in the 1930s and was formally recorded in 1958. In the 1980s, field schools from California University, California, Pennsylvania, investigated the site over three years. The excavations revealed four stockade lines in addition to 80 features and five whole or partial structures. Chipped stone, ground stone, ceramics, bone, floral, and faunal artifacts were recovered.

Site 36WH737 (the Mon City Site) is located on a terrace of the Monongahela River. The site was identified during Phase I survey for a Pennsylvania Department of

Transportation bridge construction project. The site was subjected to data recovery and it was found to be a small habitation locus dating to the Middle Monongahela phase. A small number of features were identified during the Phase II and III excavations and these included a partial house pattern, storage pits, and hearths. The artifact assemblage recovered during the Phase II excavations numbered some 14,400 items including chipped and ground stone, ceramics, and modified shell and bone.

Site 36AL285 (the Thorpe Site) was reported by a landowner to the Carnegie Museum in 1988. The site, located on an upland hill bench, was subsequently subjected to systematic investigation under the direction of Richard George (George 1998). The site is important because it represents one of the few Early Woodland non-mound sites investigated in the region. The field investigations revealed the presence of five house outlines, including one Late Woodland / Late Prehistoric Monongahela and four attributed to the Early Woodland, in addition to miscellaneous postmolds and 18 other cultural features (see Appendix J for feature and postmold data). Chipped, ground, and pecked stone tools were present including a suite of Forest Notched points. Two radiocarbon dates from site features provided absolute dates for both the robust Early Woodland and more ephemeral Late Woodland occupations of the site.

Site 36FA40 (the Howarth-Nelson Site) is situated in a saddle on the drainage divide between Dickerson Run and an unnamed tributary of the Youghiogheny River. The site was identified during cultural resources survey for a proposed natural gas pipeline and it was subsequently subjected to Phase III data recovery. The site appears to have functioned as a village during two primary occupation periods, the Late Prehistoric Middle Monongahela phase and a late Late Prehistoric or Protohistoric Monongahela phase. The latter is unnamed. The fieldwork recovered a wealth of chipped stone, ceramic, and macrobotanical evidence. In addition, 160 cultural features were identified.

Site 36WM61 (the Household Site) is situated on a high terrace of the Youghiogheny River. The site was investigated by the Society for Pennsylvania Archaeology Allegheny Chapter and the Carnegie Museum in anticipation of the construction of an athletic field. The investigations revealed the presence of a Late Monongahela village marked by a stockade, stockade trench, houses, and 37 cultural features. A broad variety of artifacts were recovered and included ceramics, chipped stone, ground stone, and bone items in addition to floral and faunal remains.

Site 46BR31 (the East Steubenville Site) is located on the top of McKim Ridge in West Virginia. This open habitation site overlooks the Ohio River just south of the confluence of the Ohio and Harmony Creek. The site seems to have been identified at least as early as the 1930s and Mayer-Oakes (1955) based on excavations conducted by E. W. Fetzer reported it. The East Steubenville Site is one of the type sites for the Panhandle Archaic. In 1999, a proposed road improvement project was scheduled to impact part of the site. The 1999 Phase II investigations were designed to determine if intact contexts remained at the site (Lawrence 1999). The fieldwork resulted in the isolation of undisturbed, culture-bearing soil profiles, a small hearth, and limited artifact recovery. The site was ultimately

subjected to an intense data recovery program and the results of that program are neatly encapsulated on the following web site: http://www.eaststeubenville.com/archaeology.html.

Site 46MR95, also in West Virginia, was identified during a Soil Conservation Service flood control project. The Saddle Site (46MR95) is an open habitation loci located on a ridge toe immediately above the confluence of Enlow and Dunkard forks with Wheeling Creek. The Phase III data recovery fieldwork recovered over 50,000 artifacts and identified 97 cultural features. Based on radiocarbon dates and artifact characteristics, two occupations were defined and they were assigned to the Monongahela Drew phase and the Middle Monongahela. The investigators considered the Middle Monongahela phase occupation to be coeval with Campbell Farm phase occupations farther to the north (Church and McDaniel 1992:149).

Site 46MR96 (the Bluebird Site) is located on a terrace of Dunkard Fork in West Virginia. This open habitation site dates to the Middle Woodland period. The data recovery investigation revealed the presence of 648 postmolds and 118 pits or stains. Of these numbers, 130 postmolds and 56 pit features were fully excavated. The data recovery artifact assemblage was comprised of chipped stone, ground stone, ceramics, and both faunal and floral specimens.

Site 46MR114 (the Roadside Park Site) was identified during the Phase I survey for the proposed West Virginia State Route 2 Franklin to Woodlands Improvements project in Marshall County. The site, an open artifact scatter, is located on the first terrace of the Ohio River. Although no prehistoric cultural features were identified during the Phase I and II fieldwork at the site, the Phase II investigations resulted in the recovery of a diverse artifact assemblage containing temporal diagnostics indicative of the Late Archaic, Early Woodland, and Middle Woodland periods. The data recovery fieldwork investigated about 732 square ft (68 square m). Although no prehistoric features were identified during the data recovery, the recovered artifact assemblage includes 11,487 chipped stone artifacts, 46 ground stone, and 554 prehistoric ceramic sherds (Gundy et al. 2000; Skelly and Loy, Inc. 2001).

Site 46WZ45 (Site 10A, also the Pleasantview Site) was found during a Phase I survey for a proposed gas pipeline in West Virginia. Located on a ridgetop, this open campsite overlooks the confluence of three upland streams. Subsequent Phase II testing of the site revealed a single hearth in addition to a suite of chipped, ground, and pecked stone artifacts. In addition, botanical remains were recovered from the hearth.

Outside Subbasin 20 Regional Sample Sites

The final group of sites in the Phase II and III sample were selected because of their locations in topographic settings similar to that of Site 36AL480 and because each of them had deeply stratified deposits. These sites are listed on Table 3.11 and detailed below the table.

Table 3.11 Outside Subbasin 20 Regional Phase II and Phase III Site Reports Reviewed in the Study Sample						
Subbasin and Watershed	**Site No.**	**Site Name**	**Site Type**	**Topographic Setting**	**Chronology (all phases of work)**	**References**
1E	36MR43	Shawnee Minisink	Open campsite	Terrace	Paleoindian, Paleoindian / Early Archaic, Early Archaic	McNett 1985
1F	36NM12	Sandts Eddy Site	Open campsite	Terrace	Early Archaic through Terminal Archaic, Early through Late Woodland	Bergman et al. 1994a, 1994b
2D	36BU23	Lower Black Eddy's Site	Open campsite	Levee / terrace	Late Archaic / Terminal Archaic, Early / Middle Woodland, Late Woodland	Schuldenrein et al. 1991: 19-75
5B	36LU90	Jacobs Site	Open campsite	Terrace	Late Archaic, Terminal Archaic, Early through Late Woodland	Weed and Wenstrom 1992
5B	36LU105	Gould Island Site	Open campsite	Island	Late Archaic, Terminal Archaic, Early through Late Woodland	Weed and Wenstrom 1992

Site 36MR43 (the Shawnee Minisink Site) is a stratified, open habitation site located in the upper Delaware River Valley. The site occupies a low terrace on the right bank of the valley. This multi-component site contains deeply buried occupations dating to the Paleoindian, Paleoindian/Early Archaic transition, and Early Archaic. The site is notable from several perspectives, but perhaps most importantly, it is one of the few early sites to have yielded paleobotanical remains in any number.

Site 36NM12 (the Sandts Eddy Site) is a stratified, open habitation site located on the first and second terraces of the Delaware River north of Easton, Pennsylvania. The site was originally identified by members of the Society for Pennsylvania Archaeology Forks of the River Chapter. It was subjected to Section 106-mandated investigations because of a proposed gas pipeline crossing of the site area. The data recovery investigations resulted in the isolation of stratified occupations dating from the Late Woodland back through the Early Archaic periods (Bergman et al. 1994a, 1994b).

Site 36BU23 (Lower Black Eddy's Site), a stratified, open habitation site, is located on a natural levee/terrace of the Delaware River. The site was originally identified in the late 1800s. It was subjected to data recovery investigations in the l980s. The work resulted in the isolation of 19 feature or feature complexes spread across stratified occupation zones dating to the Late/Terminal Archaic, Early/Middle Woodland, and Late Woodland. Also recovered during the course of the investigations were sizable assemblages of chipped stone, ceramics, and macro- and microbotanical remains.

Sites 36Lu90 and 36Lu105 (the Jacobs and Gould Island sites) are located on the North Branch of the Susquehanna River south of Shickshinney, Pennsylvania. Both sites are

stratified, open habitation sites. Site 36Lu90 is located on the first terrace of the river and Site 36Lu105 is on an island directly opposite the same terrace. The sites were identified during Phase I survey for a proposed gas pipeline loop. Subsequent Phase II and III investigations at the sites recovered evidence of stratified occupations dating from the Late Woodland back through the Late Archaic periods. The dominate occupations dated to the Late and Terminal Archaic and Early Woodland.

Collections Review

Numerous collections at the Carnegie have never been subjected to systematic recordation. At the suggestion of Dr. Richard George, 12 collections were examined and subsequently chosen for documentation. Eleven of the collections resulted from avocational survey completed by Mr. Emil Alam in Beaver County. The Alam collections are from Sites 36BV3 (Upper Field Shippingport Site), 36BV4 (Lower Field Shippingport Site), 36BV10 (Lower Baldhead Mountain Site), 36BV11 (Upper Baldhead Mountain Site), 36BV13 (Circle on Rock Site), 36BV14 (Lower McMichaels Site), 36BV21 (Biscan Farm #1 Site), 36BV22 (Boyscout Camp Site), 36BV24 (Outdoor Theatre Site), 36BV26 (Kochanioski Site), and 36BV38 (McDowell Site). The artifact inventories for these Alam sites are presented in Appendix C, Table C-1.

Mayer-Oakes (1955:256-257) used the collections from these sites, and multiple other sites in the region, to form the bases for his overview of UOV archaeology. Mayer-Oakes (1955), however, illustrated materials from the Alam collections representing only Sites 36BV4 (Mayer-Oakes 1955:162-163, Plates 99 and 100), 36BV22 (Mayer-Oakes 1955:144, Plate 82), and 36BV24 (Mayer-Oakes 1955:159, Plate 98).

The selected collections were chosen from among the 118 Pennsylvania sites from which Alam routinely collected and they were selected specifically because they had representative assemblages of both Archaic and Woodland projectile point styles.

The 12th collection, from Site 36AL19 (Blawnox Site), was donated to the Carnegie by Mrs. E. R. Ayers and the collection was accessioned January 17, 1972. The Ayers collection was chosen specifically to provide a detailed description of the early components at that site as the published report focused on the Middle Woodland component (George 1982).

In 2002, four additional collections were examined. These included the artifact assemblages from Sites 36AL6 (McKees Rock Mound), 36AL62 (Drew Site), 36AL124 (Mayview Bend Site), and 36AL480 (the Project site, Davis 1999 Phase I and II). The collections from Sites 36AL6 and 36AL62 also are housed at the Carnegie and selected elements of the collections were examined, recorded, and photographed between February 25 and March 1. The other two collections are in repository at the Pennsylvania State Museum in Harrisburg. They were subjected to analysis between February 20 and February 22, 2002. The representative items from the collection were photographed in Cincinnati on March 5, 2002.

Collections Sample Site Characteristics

The 11 sites chosen from the Emil Alam site group were examined because their diagnostic collections seemed, on paper, to possess the greatest variety. Subsequently, the environmental and cultural characteristics of the 11 Beaver County sites in the Alum group were determined to represent a cross-section of site types and site settings (Table 3.12; see also Appendices C and D). The twelfth site, 36AL19 (the Blawnox Site), is not included in the PASS (Subbasin 20) database as the site is located just outside of the subbasin in Subbasin 18. The site was chosen as it is located on the "north bank of the Allegheny River in Allegheny County" (George 1982: 181) and within 10 mi of Site 36AL480. However, the George (1982) article on the Middle Woodland component at the site provides salient details about its environmental and cultural background and these are discussed at various locations in this chapter and certain data are presented on Table 3.12. The final four sites included in the examination were detailed above in the discussion of the Phase II and III sites but are included on Table 3.12; it should be noted that the addition of the PASS database used for this study dates to 2001 and Site 36AL480 is not included in it.

On Table 3.12, the site type classifications are general, but it is considered likely that most of the sites hosted camp or short-term occupations. Site 36BV4 is classified as a village, and Site 36BV13 is somewhat unexpectedly typed as a petroglyph/pictograph locus. Apparently, there also is a substantive scatter associated with the rock art. The sites are located in a variety of settings including flood plain, terrace, and upland locations. The initial chronological assignments (presented on Table 3.12 under the heading " PASS (Subbasin 20) Named Components") are now superseded by the temporal data generated by the projectile point analyses. The projectile points identified in the study collection review and the revised components also are presented on Table 3.12.

The period-specific results of the collection sample review are presented throughout the following manuscript. The reported composition of the collections and the general results of the review are summarized below for background. The sites are discussed in numeric order.

Dragoo (1963:156-158) provides an overview of the 747 objects recovered from the 1896 excavations at Site 36AL6 (McKees Rock Mound) and Mayer-Oakes (1955:146-149, Plates 85-92) illustrates elements of the collection including antler and bone objects (Plates 85-86), projectile points (Plates 87-88), ground stone (Plates 89-90), shell artifacts (Plate 91), and a piece of worked copper (Plate 92). The collection is comprised of both funerary objects and artifacts recovered from the mound matrix. While most of the objects are presumed to be associated with the Early Woodland Adena use of the site, Dragoo (1963) noted that both Archaic and subsequent Middle Woodland Hopewell artifacts are present in the collection. Dragoo (1963:153-158) lists no chipped stone objects in his site summary but Mayer-Oakes (1955:Plates 87-88) illustrates 131 projectile points, bifaces, and blanks.

Of these tools, 28 chipped stone tools remain in the Carnegie collection. The study collection for Site 36AL6 is summarized on Table 3.13.

TABLE 3-12. Environmental and Cultural Site Characteristics from the PASS Database for the Artifact Collections Sample Sites								
Site No.	**Major Stream**	**Watershed**	**Minor Stream**	**Topographic Setting**	**PASS Site type**	**PaBHP (Subbasin 20) Named Components**	**Projectile Points in Study Collection**	**Revised Components Based on Projectile Points**
36AL6	Ohio River	20F	Chartiers Creek	Rise on floodplain	Earthworks	Prehistoric	Jack's Reef Pentagonal, Steubenville Stemmed, Cresap Stemmed, Brewerton Eared Notched, Kiski Notched, Madison, Levanna	Late Archaic, Early Woodland, Middle Woodland, Late Woodland / Late Prehistoric
36AL19	Ohio River	18A	Allegheny River	Floodplain	Open habitation	Not in Subbasin 20. George (1982) reports on Middle Woodland and early Late Woodland	Thebes, Calf Creek, St. Charles, Kirk Stemmed, MacCorkle Stemmed, LeCroy Bifurcated Stem, St. Albans Side Notched, Kanawha Stemmed, Koens-Crispin	Early Archaic, Middle Archaic, Late Archaic, Transitional Archaic, Middle Woodland, Late Woodland / Late Prehistoric
36AL62	Ohio River	20F	Chartiers Creek	Hill ridge/toe	Village including Historic Indian	Archaic	Madison, Kiski Notched, Garver's Ferry Corner Notched, Brewerton Side Notched, Levanna, Chesser Ntoched, Manker Stemmed	Late Archaic, Early Woodland, Middle Woodland, Late Woodland / Late Prehistoric
36AL124	Ohio River	20F	Chartiers Creek	Floodplain	Open habitation	Prehistoric	Early Woodland contracting stem, Garver's Ferry Corner Notched, Lamoka-like, Normanskill-like, Triangle	Late Archaic, Early Woodland, Late Woodland / Late Prehistoric
36AL480	Ohio River	20G	Ohio River	Floodplain and terraces	Open habitation (though not listed in PASS in 2001)	Not listed in PASS (as of 2001)	Brewerton Side Notched, Kiski Notched, Late Archaic Side Notched, LeCroy Bifurcated Stem, Memom / Trimble side notched	Early Archaic, Middle Archaic, Late Archaic, Middle Woodland
36BV3	Ohio River	20D	Raccoon Creek	Floodplain	Open habitation	Middle Archaic, Late Archaic, Late Woodland	Backstrum, Brewerton Corner Notched, Brewerton Side Notched, Chesser Notched, Early Woodland Stemmed, Forest Notched, Kirk Corner Notched, Kiski Notched, Late Archaic Stemmed and Stemmed Cluster, Manker Stemmed, Otter Creek	Middle Archaic, Late Archaic, Early Woodland, Middle Woodland, Late Woodland / Late Prehistoric
36BV4	Ohio River	20B	Beaver River	Terrace	Village	Woodland	Madison, St. Albans Side Notched	Early Archaic, Late Woodland / Late Prehistoric
36BV10	Ohio River	20D	Raccoon Creek	Terrace	Unknown Function Surface Scatter < 20M Radius	Early Archaic, Early Woodland	Brewerton Corner Notched, Brewerton Side Notched, Kirk Corner Notched, Kirk Stemmed, Kiski Notched, Manker Stemmed, Poplar Island	Early Archaic, Middle Archaic, Late Archaic, Middle Woodland

TABLE 3-12. Environmental and Cultural Site Characteristics from the PASS Database for the Artifact Collections Sample Sites (continued)								
Site No.	**Major Stream**	**Watershed**	**Minor Stream**	**Topographic Setting**	**PASS Site type**	**PaBHP (Subbasin 20) Named Components**	**Projectile Points in Study Collection**	**Revised Components Based on Projectile Points**
36BV11	Ohio River	20D	Raccoon Creek	Hilltop	Unknown Function Surface Scatter < 20M Radius	Middle Archaic, Early Woodland	Brewerton Corner Notched, Jack's Reef Pentagonal, Kanawha Stemmed, Madison, Manker Corner Notched, Manker Stemmed, Snook Kill	Late Archaic, Terminal Archaic, Early Woodland, Middle Woodland
36BV13	Ohio River	20D	Raccoon Creek	Terrace	Petroglyph/ Pictograph	Middle Archaic	Brewerton Corner Notched, Brewerton Side Notched, Cresap Stemmed, Garver's Ferry Corner Notched, Kirk Corner Notched, Manker Stemmed, Orient Fishtail, Otter Creek, Robbins, Snook Kill	Early Archaic, Middle Archaic, Late Archaic, Terminal Archaic, Early Woodland, Middle Woodland
36BV14	Ohio River	20D	Raccoon Creek	Floodplain	Open habitation	Middle Archaic	Backstrum, Brewerton Corner Notched, Brewerton Side Notched, Jack's Reef Corner Notched, Jack's Reef Pentagonal, Lamoka, Manker Stemmed	Early Archaic, Middle Archaic, Late Archaic, Terminal Archaic, Early Woodland, Middle Woodland
36BV21	Ohio River	20D	Raccoon Creek	Rise in Floodplain	Open habitation	Archaic, Middle Woodland	Adena Stemmed, Brewerton Corner Notched, Brewerton Side Notched, Fort Ancient, Garver's Ferry Corner Notched, Jack's Reef Pentagonal, Kiski Notched, Levanna, Madison, Manker Stemmed, Otter Creek	Early Archaic, Middle Archaic, Late Archaic, Terminal Archaic, Early Woodland, Middle Woodland
36BV22	Ohio River	20D	Raccoon Creek	Terrace	Open habitation	Middle Archaic, Late Archaic, Woodland	Adena Stemmed, Brewerton Corner Notched, Brewerton Side Notched, Early Woodland Stemmed, Kessell Side Notched, Kiski Notched, Late Archaic Stemmed, LeCroy Bifurcated Stem, Manker Corner Notched, Orient / Dry Brook, Otter Creek / Big Sandy, Robbins, Stanly Stemmed, Steubenville Lanceolate, Steubenville Stemmed	Early Archaic, Middle Archaic, Late Archaic, Terminal Archaic, Early Woodland, Middle Woodland

TABLE 3-12. Environmental and Cultural Site Characteristics from the PASS Database for the Artifact Collections Sample Sites (continued)

Site No.	Major Stream	Watershed	Minor Stream	Topographic Setting	PASS Site type	PaBHP (Subbasin 20) Named Components	Projectile Points in Study Collection	Revised Components Based on Projectile Points
36BV24	Ohio River	20D	Raccoon Creek	Floodplain	Open habitation	Middle Woodland	Adena Stemmed, Brewerton Corner Notched, Brewerton Side Notched, Chesser Notched, Cresap Stemmed, Early Woodland Stemmed, Forest Notched, Garver's Ferry Corner Notched, Hamilton Incurvate, Jack's Reef Corner Notched, Kiski Notched, LeCroy Bifurcated Stem, LeCroy Side Notched?, Madison, Manker Corner Notched, Manker Stemmed, Otter Creek / Big Sandy, Raccoon Notched, Susquehanna Broad	Early Archaic, Late Archaic, Terminal Archaic, Early Woodland, Middle Woodland, Late Woodland / Late Prehistoric
36BV26	Ohio River	20D	Raccoon Creek	Floodplain	Open habitation	Early Archaic, Middle Archaic	Brewerton Corner Notched, Brewerton Side Notched, Early Woodland Stemmed, Garver's Ferry Corner Notched, Kirk Corner Notched, Kiski Notched, Late Archaic Stemmed, LeCroy Bifurcated Stem, Otter Creek / Big Sandy, Plano Lanceolate?, Robbins, Stanly Stemmed	Paleoindian, Early Archaic, Middle Archaic, Late Archaic, Terminal Archaic, Early Woodland, Late Woodland / Late Prehistoric
36BV38	Ohio River	20D	Raccoon Creek	Stream Bench	Open habitation	Paleoindian	Adena Stemmed, Brewerton Eared Notched, Brewerton Side Notched, Cresap Stemmed, Early Woodland Stemmed, Kirk Corner Notched, Kiski Notched, Kiski Stemmed, Otter Creek / Big Sandy, Robbins, Snook Kill, Steubenville Stemmed	Paleoindian, Early Archaic, Middle Archaic, Late Archaic, Terminal Archaic, Early Woodland, Late Woodland / Late Prehistoric

Table 3.13. Study Collection Site 36AL6 (McKees Rock Mound) Artifact Type and Raw Material Summary			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
Chert, Ohio Flint Ridge (OFR)	Drill	1	
	Madison	1	
Chert, Ohio Flint Ridge (OFR) N=		**2**	**7.1**
Chert, Onondaga	Biface, Stage 3	7	
	Brewerton Eared Notched	2	
	Cresap Stemmed	4	
	Jack's Reef Pentagonal	1	
	Madison	1	
	Steubenville Stemmed	3	
Chert, Onondaga N=		**18**	**64.3**
Chert, Three Mile Creek N=	**Steubenville Stemmed**	**1**	**3.6**
Chert, unidentified	Biface, Stage 3	1	
	Cresap Stemmed	1	
	Flake, blade-like	1	
	Kiski Notched	1	
	Levanna	1	
	Scraper, end bifacial	1	
	Steubenville Stemmed	1	
Chert, unidentified N=		**7**	**25.0**
N=		**28**	**100.0**

The artifacts from 36AL6 (McKees Rock Mound) examined for this study included eight biface preforms (Appendix D, Figure D1), one biface end scraper (Figure D2), one blade-like flake (Figure D2), one drill (Figure D2), and 17 projectile points (Appendix C; Appendix D, Figures D1-D2). The latter included two Brewerton Eared Notched (Late Archaic; Figure D2), five Cresap Stemmed (Early Woodland; Figure D2), one Jack's Reef Pentagonal (Middle Woodland, Late Woodland; Figure D1), one Kiski Notched (Middle Woodland; Figure D2), one Levanna (Late Woodland / Late Prehistoric; Figure D2), two Madisons (Late Woodland / Late Prehistoric; Figure D2), and five Steubenville Stemmed (Late Archaic, Terminal Archaic; Figure D1). The projectile points suggest that the use of the site area may have been longer than recognized by Dragoo. The presence of the Brewerton Ear Notched and Madison points indicate on-site activity possibly as early as the Late Archaic and as late as the Late Woodland / Late Prehistoric. There is no particular pattern to the raw materials based on the projectile points alone (Table 3.14) though the Ohio Flint Ridge occurs as a Late Woodland / Late Prehistoric Madison and, parenthetically, as a drill also.

Table 3.14. Study Collection Site 36AL6 (McKees Rock Mound) Projectile Point Raw Materials by Time Period and Point Type				
Raw Material	**Time Period**	**Projectile Point Type**	**N=**	**% of Raw Material**
Chert, Onondaga	Late Archaic	Brewerton Eared Notched	2	
	Late Archaic, Terminal Archaic	Steubenville Stemmed	3	
	Early Woodland	Cresap Stemmed	4	
	Middle Woodland into Late Woodland, Late Prehistoric	Jack's Reef Pentagonal	1	
	Late Woodland, Late Prehistoric	Madison	1	
Chert, Onondaga N=			**11**	**64.7**
Chert, Ohio Flint Ridge (OFR) N=	**Late Woodland, Late Prehistoric**	**Madison**	**1**	**5.9**
Chert, Three Mile Creek N=	**Late Archaic, Terminal Archaic**	**Steubenville Stemmed**	**1**	**5.9**
Chert, unidentified	Late Archaic, Terminal Archaic	Steubenville Stemmed	1	
	Early Woodland	Cresap Stemmed	1	
	Middle Woodland	Kiski Notched	1	
	Late Woodland, Late Prehistoric	Levanna	1	
Chert, unidentified N=			**4**	**23.5**
N=			**17**	**100.0**

The Site 36AL19 (Blawnox) collection includes items donated by Ayers and also some items that were recovered during the 1979-1980 excavations. All of the projectile points currently present in the Carnegie collection were photographed. The 60 items examined as part of this study are summarized on Table 3.15. The items included the following projectile point types and other tool types: three Calf Creek (Early Archaic; Figure D3), one Clovis (Paleoindian; Figure D3), one Kanawha Stemmed (Early Archaic; Figure D4), one Koens-Crispin Broad (Late Archaic, Terminal Archaic; Figure D4),one Kirk Stemmed (Early Archaic; Figure D4), four LeCroy Bifurcated Stem (Early and Middle Archaic; Figure D4), one MacCorkle Stemmed (Early Archaic; Figure D4),one St. Albans Side Notched (Early Archaic; Figure D4),one St. Charles (Early Archaic; Figure D3), and four Thebes (Early Archaic; Figure D3). The projectile point temporal range from the studied collection indicates that the Blawnox Site may have hosted occupations dating from the Paleoindian through the Terminal Archaic period.

Table 3.15. Study Collection Site 36AL19 (Blawnox Site) Artifact and Raw Material Summary			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
Chert, Cochocton N=	**LeCroy Bifurcated Stem**	**2**	**3.3**
Chert, Kanawha	Calf Creek	1	
	Kirk Stemmed	1	
	Thebes	1	
Chert, Kanawha N=		**3**	**5.0**
Chert, Kanawha – like N=	**Biface, Stage 3**	**1**	**1.7**
Chert, local pebble	Biface	2	
	Biface, Stage 2	1	
	Biface, Stage 3	2	
	Drill, fragment	1	
	Flake, utilized	1	
	Scraper	1	
	Scraper, biface	1	
	Scraper, end bifacial	1	
	Scraper, endscraper	2	
	Scraper, unifacial	2	
Chert, local pebble N=		**14**	**23.3**
Chert, Onondaga	Biface, Stage 3	1	
	Drill, fragment	1	
	LeCroy Bifurcated Stem	1	
Chert, Onondaga N=		**3**	**5.0**
Chert, Onondaga – like	Drill	1	
	Drill, fragment	2	
Chert, Onondaga - like N=		**3**	**5.0**
Chert, unidentified	Biface	1	
	Biface, Stage 2	3	
	Biface, Stage 3	8	
	Calf Creek	2	
	Clovis	1	
	Core/ Scraper	1	
	Drill	1	
	Drill, fragment	3	
	Flake, blade-like	3	
	Hammerstone	1	
	Kanawha Stemmed	1	
	MacCorkle Stemmed	1	
	Scraper, endscraper	1	
	St. Albans Side Notched	1	
	St. Charles	1	
	Thebes	3	
Chert, unidentified N=		**32**	**53.3**
Jasper N=	**LeCroy Bifurcated Stem**	**1**	**1.7**
Rhyolite N=	**Koens-Crispin Broad**	**1**	**1.7**
N=		**60**	**100.0**

The projectile point raw materials (Table 3.16) are more varied than in other studied collections in general. Of particular interest is the appearance of rhyolite in a Late Archaic / Terminal Archaic context. The other rhyolite projectile point observed in the study collections was a Middle / Late Archaic Brewerton Side Notched from Site 36BV14. In all, four of the study collection sites yielded rhyolite items: 36AL19, 36BV10, 36BV14, and 36BV24, including the two points, four Stage 3 bifaces, and a primary flake. The presence of the rhyolite, in addition to jasper, Cochocton chert, and Kanawha chert could provide substance to the argument that there was either greater access to or use of so-called exotic raw materials during Archaic times in general. However, it should be kept in mind that Site 36AL19 (Blawnox) also had a robust Middle Woodland component that also contained a significant number of exotics, including Cochocton chert and Ohio Flint Ridge (George 1982:189). Thus, it could be that Blawnox's location immediately on the Allegheny River may have made it a likely recipient of imported materials at various times in prehistory.

Table 3.16. Study Collection Site 36AL19 (Blawnox Site) Projectile Point Raw Materials by Time Period and Point Type

Raw Material	Time Period	Projectile Point Type	N=	% of Raw Material
Chert, Onondaga N=	**Early Archaic, Middle Archaic**	**LeCroy Bifurcated Stem**	**1**	**5.6**
Chert, Cochocton N=	**Early Archaic, Middle Archaic**	**LeCroy Bifurcated Stem**	**2**	**11.1**
Chert, Kanawha	Early Archaic	Calf Creek	1	
		Kirk Stemmed	1	
		Thebes	1	
Chert, Kanawha N=			**3**	**16.7**
Chert, unidentified	Paleoindian	Clovis	1	
	Early Archaic	Calf Creek	2	
		Kanawha Stemmed	1	
		St. Albans Side Notched	1	
		St. Charles	1	
		Thebes	3	
	Late Archaic	MacCorkle Stemmed	1	
Chert, unidentified N=			**10**	**55.6**
Jasper N=	**Early Archaic, Middle Archaic**	**LeCroy Bifurcated Stem**	**1**	**5.6**
Rhyolite N=	**Late Archaic, Terminal Archaic**	**Koens-Crispin Broad**	**1**	**5.6**
N=			**18**	**100.2**

In addition to the projectile points, other tool types in the Site 36AL19 collection were documented. These included: 18 bifaces (Figures D5-D8); single examples of a biface endscraper (PlateD5), a biface perform (Figure D5), and a biface scraper (Figure D5); three blade-like flakes (Figure D7); a core/scraper (Figure D6); nine drill or drill fragments (Figures D5, D7-D8); three end scrapers (Figures D5-D7); a hammerstone (Figure D6); a

scraper (Figure D7); two unifacial scrapers (Figures D5-D6), and a utilized flake (Figure D8). The other items cannot be attributed to a specific time period.

The artifact assemblage from Site 36AL62, the Drew Site, is thoroughly described by Buker (1970:30-66). The 208 items from the collection reexamined as part of this current study included a variety of tools and debitage (Table 3.17).

Table 3.17. Study Collection Site 36AL62 (Drew Site) Artifact and Raw Material Summary

Raw Material	Artifact Type	N=	% of Raw Material
Chert, local pebble	Biface	1	
	Biface, Stage 1	1	
	Biface, Stage 2	18	
	Biface, Stage 2	3	
	Biface, Stage 2 fragment	1	
	Biface, Stage 3	5	
	Checked Pebble	1	
	Core	11	
	Core, bipolar	1	
	Drill, fragment proximal	1	
	Drill, tip	1	
	Flake	1	
	Flake, bipolar	2	
	Flake, decortication	2	
	Flake, primary decortication	15	
	Flake, secondary	1	
	Flake, secondary decortication	34	
	Flake, utilized	1	
	Madison, fragment	1	
	Scraper	1	
Chert, local pebble N=		**102**	**49.0**
Chert, Ohio Flint Ridge (OFR)	Drill, fragment distal	1	
	Flake, utilized	1	
	Lamellar Bladelet	1	
	Lamellar Bladelet, Proximal	1	
Chert, Ohio Flint Ridge (OFR) N=		**4**	**1.9**
Chert, Onondaga	Biface, Stage 3 fragment	1	
	Drill	1	
	Levanna, fragment proximal	1	
	Madison	8	
	Madison, fragment	4	
	Madison, fragment proximal	3	
	Unidentified projectile point, stemmed fragment	1	
Chert, Onondaga N=		**19**	**9.1**
Chert, Onondaga - like	Biface, Stage 2	1	
	Brewerton Side Notched	2	
	Flake, blade-like	1	
	Flake, secondary decortication	1	
	Madison	3	
	Triangular Preform	1	

Table 3.17. Study Collection Site 36AL62 (Drew Site) Artifact and Raw Material Summary (continued)			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
Chert, Onondaga - like N=		**9**	**4.3**
Chert, Onondaga - like (LPC)	Core	1	
	Flake, primary decortication	2	
	Flake, secondary decortication	1	
Chert, Onondaga - like (LPC) N=		**4**	**1.9**
Chert, Onondaga (LPC)	Biface, Stage 2	1	
	Biface, Stage 2 fragment	1	
	Biface, Stage 3 fragment	1	
	Flake, primary decortication	2	
	Flake, secondary decortication	1	
Chert, Onondaga (LPC) N=		**6**	**2.9**
Chert, unidentified	Biface fragment	1	
	Biface preform, fragment proximal	1	
	Biface, Stage 2	4	
	Biface, Stage 2	1	
	Biface, Stage 2 proximal	2	
	Biface, Stage 3	4	
	Brewerton Side Notched	1	
	Chesser Notched	1	
	Core	1	
	Drill	9	
	Drill	1	
	Drill, Madison	1	
	Flake, blade-like	3	
	Flake, primary	1	
	Flake, utilized	1	
	Garver's Ferry Corner Notched	1	
	Graver	1	
	Kiski Notched	3	
	Levanna, fragment proximal	1	
	Madison	10	
	Madison, fragment	3	
	Madison, fragment base	1	
	Madison, fragment proximal	5	
	Madison, preform	1	
	Manker Stemmed	1	
	Scraper, unifacial	1	
	Triangular Preform	3	
	Unidentified projectile point, fragment distal end	1	
Chert, unidentified N=		**64**	**30.8**
N=		**208**	**99.9**

The tools included 33 whole and fragmentary bifaces (Figures D9-D10, D13, D16-D23); biface preforms; 14 whole and fragmentary drills (Figures D9-D10, D12, D14-D16, D18, D23), a graver, projectile points (discussed below), a unifacial scraper, and utilized flakes. The cores and debitage included blade-like flakes; a checked pebble; a bipolar core

and undistinguished cores; primary and secondary decortication flakes, and lamellar bladelets (Figures D12, D23). Herein, blade-like flakes refer to flakes that visually are twice as long as they are wide. These items have not been struck from a prepared blade core. In contrast, the lamellar bladelets observed in this collection were struck from a polyhedral core. This tool form is diagnostic of the Middle Woodland Hopewell in the region and this temporal assignation is supported by the presence of a suite of Middle Woodland projectile points in the collection.

While the site's projectile point assemblage, as reported and as present in the collection, is clearly dominated by Late Woodland / Late Prehistoric Monongahela diagnostics (Levannas and Madisons in particular), diagnostics of earlier time periods are present. These include Brewerton Side Notched (Middle Archaic, Late Archaic), Garver's Ferry Corner Notched (Middle Woodland), Kiski Notched (Middle Woodland), Manker Stemmed (Middle Woodland), and Chesser Notched (Late Woodland / Late Prehistoric). However, there is no particular pattern to raw material used by time period (Table 3.18); rather, there is an apparent reliance on the locally available cherts including Onondaga, local pebble, and unidentified.

Table 3.18. Study Collection Site 36AL62 (Drew Site) Projectile Point Raw Materials by Time Period and Projectile Point Type

Raw Material	Time Period	Projectile Point Type	N=	% of Raw Material
Chert, Onondaga	Late Woodland, Late Prehistoric	Levanna, fragment proximal	1	
		Madison	8	
		Madison, fragment proximal	3	
		Madison, fragment proximal	4	
Chert, Onondaga N=			**16**	**31.4**
Chert, local pebble N=	**Late Woodland, Late Prehistoric**	**Madison, fragment proximal**	**1**	**2.0**
Chert, Onondaga - like	Middle Archaic, Late Archaic	Brewerton Side Notched	2	
	Late Woodland, Late Prehistoric	Madison	3	
Chert, Onondaga - like N=			**5**	**9.8**
Chert, unidentified	Middle Archaic, Late Archaic	Brewerton Side Notched	1	
	Middle Woodland	Garver's Ferry Corner Notched	1	
		Kiski Notched	3	
		Manker Stemmed	1	
	Late Woodland, Late Prehistoric	Chesser Notched	1	
		Drill, Madison	1	
		Levanna, fragment proximal	1	
		Madison	10	
		Madison, fragment proximal	5	
		Madison, fragment proximal	4	
		Madison, preform	1	
Chert, unidentified N=			**29**	**56.9**
N=			**51**	**100.1**

Buker's (1970) collection descriptions are particularly detailed as regards the ground and polished stone. This subassemblage includes a variety of discoidals, ellipsoidals, hammerstones, pendants, and other functional and decorative items. Buker (1970:37-38) noted that the majority of the projectile points in the collection were Late Woodland / Late Prehistoric triangulars but that Archaic and earlier Woodland diagnostics also were present. He ascribes these projectile points to the Laurentian Archaic, "a few late Adena or 'Robbins' Adena…", and "…some Snyder Hopewell types…" (Buker 1970:38). He also noted the presence of two bifurcates. The antler, bone, and shell artifacts in the collection represent the broad array of tool types and personal adornments known for the late period of occupation at the site. Finally, the treatment of the ceramic collection is very thorough for a short publication. In particular, the detail on appendages, castellations, and rim form is quite informative (Buker 1970:48-54).

The Mayview Depot Site (36AL124) collection at the PHMC includes materials recovered from all stages of investigation at the site. The entire collection was subjected to systematic re-categorization by the museum after the artifacts were submitted for curation. Based on the corrected artifact catalogues, the primary inadequacies in the submitted artifact inventories were insufficient material and type descriptions. The museum classified the raw materials by color and material type. The color assignments apparently were subjective. No attempt was made to correlate color with particular raw material types, as the objective of the museum's re-classification was to provide an accurate description of each bag's contents.

Overall, the collection is dominated by chipped stone material though ceramics and ground stone also are present. Much of the assemblage was recovered as a result of the Phase III systematic surface collection. A limited number of items were recovered from excavation proveniences and almost all of these represent plowzone contexts. Artifacts recovered from both natural and cultural features also are present in the collection. The features represented are numbers 1 (natural), 5, and 11 from the Phase I and II excavations, and Phase III Features 12-14, 18, 19, 20A-B, 21, 22, 25, 27, 27A-C, 28-30, 30A, 31-34, 35A-B, 40, 43, 44A-C, 45A-D, 46B, 47, 52, 54A-C, 57A, 59, 60, 61, 62A-B, 63, 64, 66, 70, 71, 72A-B, and 73-75. Much of the feature material, however, was flotation residue and these classes of artifacts, for the most part, were not submitted with the curated collection.

In total, 58 chipped stone artifacts from the Mayview Depot collection were reviewed as part of this study (Table 3.19). The items included 15 bifaces, biface fragments, or preforms; one quarry blank; 14 cores; 11 primary or secondary decortication flakes; one utilized flake; 11 whole or fragmentary projectile points; and six bifacial or unifacial tools. The fragmentary projectile points are unassignable to specific types or time periods. They are described above in Table 3.19.

Based on the proveniencing of the items, most were believed by the site's investigators to probably date to the Late Archaic/Early Woodland occupations of the site. However, at least two of the points are most commonly assigned to later periods. These include a Late Woodland / Late Prehistoric Triangle and a possible Middle Woodland Garver's Ferry Corner Notched (Table 3.20).

Table 3.19. Study Collection Site 36AL124 (Mayview Bend Site) Artifact and Raw Material Summary			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
Chert, Cochocton N=	**Triangle**	**1**	**1.7**
Chert, local pebble	Biface, Stage 2	2	
	Biface, Stage 2 with initial edging	1	
	Biface, Stage 3	1	
	Core	3	
	Flake, decortication	1	
	Flake, primary utilized (expedient) lateral margin	1	
	Flake, primary with 1 lateral edge utilized	1	
Chert, local pebble N=		**10**	**17.2**
Chert, Monongahela N=	**Core**	**1**	**1.7**
Chert, Ohio Flint Ridge (OFR) N=	**Biface fragment, lateral**	**1**	**1.7**
Chert, Ohio Flint Ridge?	Blank, quarry (Stage 1)	1	
	Core	1	
Chert, Ohio Flint Ridge? N=		**2**	**3.4**
Chert, Ten Mile – like N=	**Biface, Stage 3**	**1**	**1.7**
Chert, Ten Mile? N=	**Unidentified projectile point, straight stemmed fragment w/ tip fracture**	**1**	**1.7**
Chert, unidentified	Biface fragment	1	
	Biface, Stage 3	1	
	Blocky debris	1	
	Flake, decortication	3	
	Flake, fragment distal	1	
	Flake, secondary	1	
	Flake, utilized (expedient)	1	
	Garver's Ferry Corner Notched?	1	
	Normanskill-like	1	
	Unidentified projectile point fragment, straight stem w/ tip fracture	1	
	Unidentified projectile point fragment, straight stemmed	1	
Chert, unidentified N=		**13**	**22.4**
Chert, unidentified (patinated) N=	**Core**	**1**	**1.7**
Chert, unidentified (no cortex)	Biface fragment, lateral	1	
	Block	1	
	Early Woodland contracting stem (resharpened)	1	
	Unidentified projectile point fragment, contracting stem, weakly shouldered, proximal	1	
	Unidentified projectile point fragment, expanding stem and assymetrical blade (possible knife)	1	
	Unidentified projectile point fragment, expanding stem slightly concave base weakly shouldered	1	
Chert, unidentified (no cortex) N=		**6**	**10.3**

Table 3.19. Study Collection Site 36AL124 (Mayview Bend Site) Artifact and Raw Material Summary (continued)			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
Chert, unidentified (no cortex), Uniontown-like N=	**Biface fragment, base (no cortex)**	**1**	**1.7**
Chert, unidentified (weathered cortex)	Biface, Stage 2	1	
	Biface, Stage 2 distal	1	
	Biface, Stage 3 base with platform preparation	1	
	Core	3	
	Core, utilized along a single margin	1	
	Lamoka-like, possibly resharpened	1	
	Rock	1	
	Shatter, utilized (expedient)	2	
Chert, unidentified (weathered cortex) N=		**11**	**19.0**
Chert, Uniontown	Core	1	
	Flake, decortication	1	
	Scraper, unifacial	1	
Chert, Uniontown N=		**3**	**5.2**
Chert, Uniontown (weathered cortex) N=	**Core**	**1**	**1.7**
Metaquartzite	Flake, decortication	3	
	Scraper, end (expedient)	1	
Metaquartzite N=		**4**	**6.9**
Metaquartzite (LPC) N=	**Biface fragment, base**	**1**	**1.7**
N=		**58**	**99.7**

Table 3.20. Study Collection Site 36AL124 (Mayview Bend Site) Projectile Point Raw Materials by Time Period and Point Type				
Raw Material	**Time Period**	**Projectile Point Type**	**N=**	**% of Raw Material**
Chert, Cochocton N=	**Late Woodland, Late Prehistoric**	**Triangle**	**1**	**20.0**
Chert, unidentified	Late Archaic	Normanskill-like	1	
	Middle Woodland	Garver's Ferry Corner Notched?	1	
Chert, unidentified N=			**2**	**40.0**
Chert, unidentified (no cortex) N=	**Early Woodland**	**Early Woodland contracting stem (resharpened)**	**1**	**20.0**
Chert, unidentified (weathered cortex) N=	**Late Archaic**	**Lamoka-like, possibly resharpened**	**1**	**20.0**
N=			**5**	**100.0**

The PHMC collection from Site 36AL480 apparently includes all items recovered during Davis' 1999 Phase I and limited Phase II excavations. The catalogue process does not appear to have been finished; some bags listed as containing flake shatter hold a broad array of flake types (for example, Field Catalog #36AL480/68 from Feature 21, Unit 38, Stratum II). The collection review resulted in the re-examination of 173 artifacts (Table 3.21). The

items included two blocky debris; 55 whole or fragmentary bifaces or preforms; 32 whole or fragmentary cores; 64 flakes including primary and secondary decortication examples; 16 whole or partial projectile points; and four unifacial or bifacial flakes.

Table 3.21. Study Collection Site 36AL480 Artifact and Raw Material Summary

Raw Material	Artifact Type	N=	% of Raw Material
Chert, Kanawha N=	**LeCroy Bifurcated Stem**	**1**	**0.6**
Chert, local pebble	Biface tool, proximal	1	
	Biface tool, unknown	1	
	Biface, initial edging only	1	
	Biface, Stage 2	2	
	Biface, Stage 2 (2 refit)	1	
	Biface, Stage 2 fragment	1	
	Biface, Stage 2 lateral	1	
	Biface, Stage 2 proximal	6	
	Biface, Stage 3	1	
	Biface, Stage 3 distal	1	
	Biface, Stage 3 lateral	1	
	Biface, Stage 3 proximal	2	
	Blocky debris	1	
	Core	2	
	Core, fragment	20	
	Flake, bipolar primary	1	
	Flake, fragment distal	1	
	Flake, primary	4	
	Flake, primary decortication	2	
	Flake, primary decortication fragment	1	
	Flake, primary decortication proximal, utilized expedient	1	
	Flake, primary decortication, utilized (expedient)	1	
	Flake, primary decortiction, utilized (expedient)	1	
	Flake, primary distal	1	
	Flake, primary proximal	1	
	Flake, primary retouched (but not expedient)	1	
	Flake, primary utilized (expedient)	4	
	Flake, secondary	1	
	Flake, secondary decortication	9	
	Flake, secondary decortication, distal fragment	1	
	Flake, secondary decortication, proximal fragment	1	
	Flake, secondary decortication, utilized (expedient)	4	
	Scraper, end unifacial (retouched)	1	
Chert, local pebble N=		**78**	**45.1**
Chert, Monongahela	Flake, secondary decortication	1	
	Unidentified projectile point, stemmed small	1	
Chert, Monongahela N=		**2**	**1.2**

Table 3.21. Study Collection Site 36AL480 Artifact and Raw Material Summary (continued)			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
Chert, Monongahela (with heavy patination) N=	**Drill, on reworked unidentified side notched projectile point**	**1**	**0.6**
Chert, Ohio Flint Ridge (OFR)	Flake, fragment utilized (off late stage preform)	1	
	Flake, secondary, utilized (expedient)	1	
	Flake, utilized (expedient, no retouch)	1	
	Scraper, side (unifacial and bifacial)	1	
	Unidentified projectile point, fragment	1	
Chert, Ohio Flint Ridge (OFR) N=		**5**	**2.9**
Chert, Onondaga	Biface, Stage 2	1	
	Flake, secondary decortication	1	
	Flake, secondary decortication, utilized (expedient)	1	
	Kiski Notched	1	
	Scraper, unifacial distal	1	
	Unidentified projectile point, corner notched fragment	1	
Chert, Onondaga N=		**6**	**3.5**
Chert, Onondaga (LPC)	Biface, Stage 2	4	
	Biface, Stage 2 distal	1	
	Biface, Stage 2 proximal	1	
	Biface, Stage 2 proximal	3	
	Core, fragment	8	
	Flake, primary	2	
	Flake, primary decortication (n=4)	1	
	Flake, secondary (blade-like), expedient use	1	
	Flake, secondary decortication	3	
Chert, Onondaga (LPC) N=		**24**	**13.9**
Chert, Onondaga (no cortex)	Biface tool, proximal	1	
	Biface, midsection	1	
	Biface, Stage 2	2	
	Biface, Stage 2 fragment	1	
	Biface, Stage 3 distal	1	
	Biface, Stage 3 proximal	1	
	Biface, Stage 3 proximal	1	
	Biface, Stage 3 tip	1	
	Flake, BTF utilized	1	
	Flake, secondary, utilized (expedient)	1	
Chert, Onondaga (no cortex) N=		**11**	**6.4**
Chert, Ten Mile (no cortex) N=	**Biface, Stage 2 proximal**	**1**	**0.6**
Chert, unidentified	Biface fragment	1	
	Biface tool, fragment	1	
	Biface, Stage 2	2	
	Biface, Stage 3 distal	1	
	Biface, Stage 3 proximal	1	
	Blocky debris	1	
	Core, fragment	1	

Table 3.21. Study Collection Site 36AL480 Artifact and Raw Material Summary (continued)			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
	Flake, primary decortication	1	
	Flake, primary decortication fragment	1	
	Flake, primary decortication fragment	1	
	Flake, primary decortication, utilized (expedient)	2	
	Flake, secondary decortication	6	
	Flake, secondary decortication, utilized (expedient)	1	
	Flake, secondary, utilized (expedient)	1	
	Late Archaic Side Notched	1	
	Merom/Trimble side notched	1	
	Unidentified projectile point, side notched proximal fragment	1	
Chert, unidentified N=		**24**	**13.9**
Chert, unidentified (no cortex)	Biface, preform triangular (no cortex)	1	
	Biface, Stage 2	4	
	Biface, Stage 2 proximal	1	
	Biface, Stage 3	1	
	Biface, Stage 3	1	
	Biface, Stage 3 proximal	1	
	Brewerton Side Notched	2	
	Core, fragment	1	
	Flake, fragment distal (no cortex) utilized expedient	1	
	Unidentified projectile point, small stemmed fragment	1	
	Unidentified projectile point, stem base	1	
	Unidentified projectile point, stemmed	1	
	Unidentified projectile point, triangular base	1	
Chert, unidentified (no cortex) N=		**17**	**9.8**
Chert, Uniontown (some patination) N=	**Brewerton Side Notched (no cortex)**	**1**	**0.6**
Chert, Uniontown-like (LPC) N=	**Biface, Stage 2 proximal**	**1**	**0.6**
Jasper N=	**Unidentified projectile point, side notched**	**1**	**0.6**
N=		**173**	**100.3**

The 36AL480 projectile point collection does not provide particularly useful raw material sourcing information (Table 3.22). The presence of a single Kanawha chert LeCroy point (Early Archaic, Middle Archaic; Figure D26) indicates awareness of and possibly access to extralocal raw materials sources. This familiarity and access is reinforced by the presence of Ohio Flint Ridge items in the collection as well (see Table 3.21 above). As was the case with 36AL19 (Blawnox Site), the river's proximity to the site probably expedited the transfer of such materials.

Table 3.22. Study Collection Site 36AL480 Projectile Point Raw Materials by Time Period and Point Type				
Raw Material	**Time Period**	**Projectile Point Type**	**N=**	**% of Raw Material**
Chert, Kanawha N=	**Early Archaic, Middle Archaic**	**LeCroy Bifurcated Stem**	**1**	**14.3**
Chert, Onondaga N=	**Middle Woodland**	**Kiski Notched**	**1**	**14.3**
Chert, unidentified	Late Archaic	Late Archaic Side Notched	1	
		Merom/Trimble side notched	1	
Chert, unidentified N=			**2**	**28.6**
Chert, unidentified (no cortex) N=	**Middle Archaic, Late Archaic**	**Brewerton Side Notched**	**2**	**28.6**
Chert, Uniontown (some patination) N=	**Middle Archaic, Late Archaic**	**Brewerton Side Notched (no cortex)**	**1**	**14.3**
N=			**7**	**100.1**

The total contents of the 11 Alam sites (36BV3, 4, 10, 11, 13, 14, 21, 22, 24, 26, and 38; Carnegie Accession #32732) are summarized on Appendix C, Table C-1. Each of the site collections is briefly characterized below prior to a discussion of the studied elements from each site.

The collection (Carnegie FC E-205, E-206) from Site 36BV3 (Upper Field Shippingport Site) was recovered from surface contexts (n=447) and from an excavated pit (n=218). The surface artifacts included chipped and ground stone, a 'boar' tusk, and a musket ball. The pit yielded 110 'flint flakes', and 108 Watson ware ceramics. No ceramics are present in the surface collection. Of the items in the total collection, 64 were examined as part of this study (Table 3.23). The non-projectile point chipped stone items in the study sample included three bifaces, a biface fragment, a bipolar flake, and six drills (all on Figure D31). Of this group, only two of the items are confirmably manufactured on LPC (a biface fragment and the bipolar flake). All but one of the remaining artifacts are unidentified chert. The single exception is a drill manufactured on Ohio Flint Ridge chert. Finally, three netsinkers and a grooved hammer/maul also were documented (Figure D32).

The projectile points from the surface collection included examples from most of the periods of local prehistory (Table 3.24). These were Backstrum (Late Woodland; Figure D29); Brewerton Side Notched (Middle / Late Archaic; Figures D28-D30) and Brewerton Corner Notched (Late Archaic; Figure D28); Chesser Notched (Late Woodland; Figure D30); Early Woodland Stemmed (Plate 28); Forest Notched (Early Woodland; Figure D30); Kirk Corner Notched (Early Archaic; Plate 27); Kiski Notched (Middle Woodland; Figures D28, D30); Late Archaic Stemmed Cluster (Figures D28, D30); Manker Stemmed (Middle Woodland; Figures D28-D30); Otter Creek (Early Archaic; Plate 27), and unidentified expanded stem (Figure D30) and side notched (Figure D29) examples.

Table 3.23. Study Collection Site 36BV3 (Upper Field Shippingport Site) Artifact and Raw Material Summary			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
Chert, Kanawha	Backstrum	2	
	Brewerton Side Notched	1	
	Late Archaic Stemmed Cluster	1	
	Manker Stemmed	1	
Chert, Kanawha N=		**5**	**7.8**
Chert, local pebble	Biface fragment	1	
Chert, local pebble N=		**1**	**1.6**
Chert, Ohio Flint Ridge (OFR)	Drill	1	
	Manker Stemmed	2	
Chert, Ohio Flint Ridge (OFR) N=		**3**	**4.7**
Chert, Onondaga	Backstrum	1	
	Brewerton Corner Notched	1	
	Brewerton Side Notched	6	
	Forest Notched	1	
	Late Archaic Stemmed	1	
	Manker Stemmed	1	
	Otter Creek	3	
	Unidentified projectile point, expanded stem	1	
Chert, Onondaga N=		**15**	**23.4**
Chert, Onondaga - like (LPC)	Flake, bipolar	1	
Chert, Onondaga - like (LPC) N=		**1**	**1.6**
Chert, unidentified	Biface, Stage 2	3	
	Brewerton Corner Notched	1	
	Brewerton Side Notched	10	
	Chesser Notched	1	
	Drill	5	
	Early Woodland Stemmed	1	
	Kirk Corner Notched	1	
	Kiski Notched	3	
	Late Archaic Stemmed	1	
	Late Archaic Stemmed Cluster	2	
	Manker Stemmed	5	
	Otter Creek	1	
	Unidentified projectile point, side notched	1	
Chert, unidentified N=		**35**	**54.7**
Not identified	Hammer/maul, grooved	1	
Not identified	Ground stone, Net Sinker	3	
Not identified N=		**4**	**6.3**
N=		**64**	**100.1**

Table 3.24. Study Collection Site 36BV3 (Upper Field Shippingport Site) Projectile Point Raw Material by Time Period and Point Type				
Raw Material	**Time Period**	**Projectile Point Type**	**N=**	**% of Raw Material**
Chert, Onondaga	Early Archaic	Otter Creek	3	
	Middle Archaic, Late Archaic	Brewerton Side Notched	6	
	Late Archaic	Brewerton Corner Notched	1	
		Late Archaic Stemmed	1	
	Early Woodland	Forest Notched	1	
	Middle Woodland	Manker Stemmed	1	
	Late Woodland, Late Prehistoric	Backstrum	1	
Chert, Onondaga N=			**14**	**29.8**
Chert, Kanawha	Middle Archaic, Late Archaic	Brewerton Side Notched	1	
	Late Archaic	Late Archaic Stemmed Cluster	1	
	Middle Woodland	Manker Stemmed	1	
	Late Woodland, Late Prehistoric	Backstrum	2	
Chert, Kanawha N=			**5**	**10.6**
Chert, Ohio Flint Ridge (OFR) N=	**Middle Woodland**	**Manker Stemmed**	**2**	**4.3**
Chert, unidentified	Early Archaic	Kirk Corner Notched	1	
		Otter Creek	1	
	Middle Archaic, Late Archaic	Brewerton Side Notched	10	
	Late Archaic	Brewerton Corner Notched	1	
		Late Archaic Stemmed	1	
		Late Archaic Stemmed Cluster	2	
	Early Woodland	Early Woodland Stemmed	1	
	Middle Woodland	Kiski Notched	3	
		Manker Stemmed	5	
	Late Woodland, Late Prehistoric	Chesser Notched	1	
Chert, unidentified N=			**26**	**55.3**
N=			**47**	**100.0**

The types of projectile point raw materials (Table 3.24) again suggest the persistent use of extralocal raw material through the Archaic era and the low, but consistent use of Ohio Flint Ridge in the Middle Woodland. In general, Kanawha chert here, and in other collections, seems also to occur, though usually at levels less than five percent in any assemblage.

The Site 36BV4 (Lower Field Shippingport Site) collection (Carnegie FC E-207) includes only materials recovered from the surface of the site. The general collection contains ground stone, chipped stone, ceramics (Mayer-Oakes 1955:Plate 100), and worked and unworked bone and shell. The items documented during this study included seven Madison projectile points (Late Woodland, Late Prehistoric; Figure D33), a St. Albans Side Notched point (Early Archaic; Figure D33), six bifaces (Figure D34), a biface fragment (Figure D34), a secondary decortication flake (with pebble cortex) (Figure D34), and a utilized secondary flake (Figure D34) (Table 3.25).

Table 3.25. Study Collection Site 36BV4 (Lower Field Shippingport Site) Artifact and Raw Material Summary

Raw Material	Artifact Type	N=	% of Raw Material
Chert, Cochocton N=	**Flake, secondary**	**1**	**4.8**
Chert, local pebble	Biface, Stage 2	3	
	Biface, Stage 2 fragment	1	
	Flake, secondary decortication	1	
	Madison	7	
Chert, local pebble N=		**12**	**57.1**
Chert, unidentified	Biface, Stage 2	1	
	Biface, Stage 3	1	
	St. Albans Side Notched	1	
Chert, unidentified N=		**3**	**14.3**
Jasper-like N=	**Biface, Stage 3**	**1**	**4.8**
Not identified N=	**Ground stone, Net Sinker**	**3**	**14.3**
Sandstone N=	**Ground stone, Net Sinker**	**1**	**4.8**
N=		**21**	**100.1**

Four of the six bifaces displayed pebble cortex and two, without cortex rind, were heat treated. Four examples of side notched netsinkers were present in the collection also (Figure D35). The Madison points in this collection are the only suite of projectile points from any study collection site where all items were produced on confirmed local pebble chert (Table 3.26). The exclusive use of local pebble chert in this Madison collection implies little as local pebble chert consistently appears in all of the study collections. In the absence of data concerning the entire site's assemblage (including debitage), there is no way of determining whether or not the choice of raw material reflects selection or chance.

Table 3.26. Study Collection Site 36BV4 (Lower Field Shippingport Site) Projectile Point Raw Materials by Time Period and Point Type

Raw Material	Time Period	Point Type	N=	% of Raw Material
Chert, local pebble N=	**Late Woodland, Late Prehistoric**	**Madison**	**7**	**87.5**
Chert, unidentified N=	**Early Archaic**	**St. Albans Side Notched**	**1**	**12.5**
N=			**8**	**100.0**

The Alam collection (Carnegie FC E-210) from Site 36BV10 (Lower Baldhead Mountain Site) also was comprised of surface materials. The general collection included 144 ground stone, chipped stone, grit tempered body and rim sherds, and an assemblage of historic items. The 28 tools measured and examined for the current study included 14 projectile points (Figure D36), 11 bifaces (Figure D37), a drill fragment (Figure D37), an adze (Figure D38), and a side notched netsinker (Figure D38) (Table 3.27). Except for a single Stage 2 biface, all of the bifaces were Stage 3 items manufactured on unidentified chert, Onandaga-like chert, local pebble chert, and a rhyolite-like material. Two of the bifaces displayed heat damage.

Table 3.27. Study Collection Site 36BV10 (Lower Baldhead Mountain Site) Artifact and Raw Material Summary

Raw Material	Artifact Type	N=	% of Raw Material
Chert, local pebble	Biface, Stage 2	1	
	Biface, Stage 3	1	
Chert, local pebble N=		**2**	**7.1**
Chert, Onondaga	Brewerton Corner Notched	1	
	Brewerton Side Notched	3	
	Lamoka	2	
	Poplar Island	1	
Chert, Onondaga N=		**7**	**25.0**
Chert, Onondaga – like N=	**Biface, Stage 3**	**2**	**7.1**
Chert, Onondaga - like (LPC) N=	**Biface, Stage 3**	**1**	**3.6**
Chert, unidentified	Biface, Stage 3	4	
	Biface, Stage 3 fragment	1	
	Brewerton Corner Notched	1	
	Drill, fragment	1	
	Kirk Corner Notched	2	
	Kirk Stemmed	1	
	Kiski Notched	1	
	Manker Stemmed	2	
Chert, unidentified N=		**13**	**46.4**
Igneous N=	**Ground stone, adze**	**1**	**3.6**
Rhyolite – like N=	**Biface, Stage 3**	**1**	**3.6**
Sandstone N=	**Ground stone, Net Sinker**	**1**	**3.6**
N=		**28**	**100.0**

The projectile points from Site 36BV10 (Lower Baldhead Mountain Site) included Early Archaic Kirk Corner Notched and Stemmed; Middle and Late Archaic Brewerton Side Notched and Late Archaic Brewerton Corner Notched; Late Archaic Lamoka and Poplar Island; and Middle Woodland Kiski Notched and Manker Stemmed (Table 3.28). The projectile point raw materials used in the point manufacture continue to point to a reliance upon locally available stone through the Archaic era and into the Woodland.

Table 3.28. Study Collection Site 36BV10 (Lower Baldhead Mountain Site) Projectile Point Raw Materials by Time Period and Projectile Point Type				
Raw Material	**Time Period**	**Projectile Point Type**	**N=**	**% of Raw Material**
Chert, Onondaga	Middle Archaic, Late Archaic	Brewerton Side Notched	3	
	Late Archaic	Brewerton Corner Notched	1	
		Lamoka	2	
		Poplar Island	1	
Chert, Onondaga N=			**7**	**50.0**
Chert, unidentified	Early Archaic	Kirk Corner Notched	2	
		Kirk Stemmed	1	
	Late Archaic	Brewerton Corner Notched	1	
	Middle Woodland	Kiski Notched	1	
		Manker Stemmed	2	
Chert, unidentified N=			**7**	**50.0**
N=			**14**	**100.0**

Artifacts listed in the catalogue (Carnegie FC E-211) for Site 36BV11 (Upper Baldhead Mountain Site) include 134 ground stone, chipped stone, prehistoric ceramics, and five miscellaneous historic items (Appendix C). The elements of the collection examined for the current study (Table 3.29) included 14 projectile points (Figure D39), eight bifaces (Figure D40), a biface fragment (Figure D40), and a unifacial end scraper manufactured on LPC (Figure D40).

Table 3.29. Study Collection Site 36BV11 (Upper Baldhead Mountain Site) Artifact and Raw Material Summary			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
Chert, local pebble	Madison	3	
	Scraper, endscraper unifacial	1	
Chert, local pebble N=		**4**	**13.8**
Chert, Ohio Flint Ridge (OFR)	Manker Corner Notched	1	
	Manker Stemmed	1	
Chert, Ohio Flint Ridge (OFR) N=		**2**	**6.9**
Chert, unidentified	Biface, Stage 2	7	
	Biface, Stage 3	1	
	Biface, Stage 3 fragment	1	
	Brewerton Corner Notched	5	
	Jack's Reef Pentagonal	1	
	Kanawha Stemmed	1	
	Manker Stemmed	1	
	Snook Kill	1	
Chert, unidentified N=		**18**	**62.1**
Not identified	Ground stone, bolo	1	
	Ground stone, Net Sinker	4	
Not identified N=		**5**	**17.2**
N=		**29**	**100.0**

Two of the bifaces displayed cortical rind reminiscent of pebble cortex; a third example had so-called 'soft' cortex which results from water erosion. As observed in other collections, Middle Woodland diagnostics in the Manker series were manufactured of Ohio Flint Ridge chert (Table 3.30). At Site 36BV11 (Upper Baldhead Mountain Site), one of the Manker points also was manufactured on unidentified chert as were other point types spanning the Archaic and Woodland eras. Netsinkers and a bolo (Figure D41) also were examined. As with the other documented netsinkers, the examples from Site 36BV11 were side notched. The bolo was manufactured on a river cobble and, except for the center tie-line, is unmodified.

Table 3.30. Study Collection Site 36BV11 (Upper Baldhead Mountain Site) Projectile Point Raw Materials by Time Period and Point Type

Raw Material	Time Period	Projectile Point Type	N=	% of Raw Material
Chert, local pebble N=	**Late Woodland, Late Prehistoric**	**Madison**	**3**	**21.4**
Chert, Ohio Flint Ridge (OFR)	Middle Woodland	Manker Corner Notched	1	
		Manker Stemmed	1	
Chert, Ohio Flint Ridge (OFR) N=			**2**	**14.3**
Chert, unidentified	Early Archaic	Kanawha Stemmed	1	
	Late Archaic	Brewerton Corner Notched	5	
	Late Archaic, Terminal Archaic	Snook Kill	1	
	Middle Woodland	Manker Stemmed	1	
	Middle Woodland into Late Woodland, Late Prehistoric	Jack's Reef Pentagonal	1	
Chert, unidentified N=			**9**	**64.3**
N=			**14**	**100.0**

The Site 36BV13 (Circle on Rock Site) artifact inventory (Carnegie FC E-213) lists ground stone and an array of Archaic and Woodland points in addition to various other chipped stone tools. In total, 198 items are represented in the collection. Of this number, 21 projectile points (Figures D42-D43), 12 chipped stone tools (Figure D44), and three ground stone (Figure D45) were subjected to further examination (Table 3.31).

The projectile points, listed alphabetically, included Brewerton Corner and Side Notched (Middle, Late Archaic; Figure D42), Cresap Stemmed (Early Woodland; Figure D43), Garver's Ferry Corner Notched (Middle Woodland; Figures D42-D43), Kirk Corner Notched (Early Archaic; Figure D42), Manker Stemmed (Middle Woodland; Figure D42), Orient Fishtail (Terminal Archaic, Early Woodland; Figure D42), Otter Creek (Early Archaic; Figure D42), Robbins (Early Woodland; Figure D43), and Snook Kill (Late Archaic, Terminal Archaic; Figure D42). This suite of projectile points spans the Archaic era

and extends into the Middle Woodland (Table 3.32). The use of Ohio Flint Ridge for the manufacture of the Adena Robbins blade is typical of eastern Ohio assemblages and is common also in Early Woodland West Virginia collections. Somewhat unexpected is the presence of an OFR flake (Table 3.31), albeit utilized, as this exotic material does not commonly appear as debitage or expedient tools in area collections. The obvious exception to this is the presence of it in the Site 36AL480 collection as expedient tools.

Table 3.31. Study Collection Site 36BV13 (Circle on Rock Site)
Artifact and Raw Material Summary

Raw Material	Artifact Type	N=	% of Raw Material
Chert, Kanawha – like N=	**Biface, Stage 2**	**1**	**2.8**
Chert, local pebble N=	**Biface, Stage 2**	**2**	**5.6**
Chert, Ohio Flint Ridge (OFR)	Flake, utilized fragment	1	
	Robbins	1	
Chert, Ohio Flint Ridge (OFR) N=		**2**	**5.6**
Chert, Onondaga	Brewerton Corner Notched	2	
	Brewerton Side Notched	4	
	Kirk Corner Notched	1	
	Orient Fishtail	1	
	Snook Kill	1	
Chert, Onondaga N=		**9**	**25.0**
Chert, Onondaga - like	Flake, utilized	1	
	Flake, utilized distal fragment	1	
Chert, Onondaga - like N=		**2**	**5.6**
Chert, unidentified	Biface, Stage 2	1	
	Biface, Stage 3	2	
	Brewerton Corner Notched	1	
	Brewerton Side Notched	1	
	Cresap Stemmed	2	
	Flake, blade-like utilized	1	
	Flake, utilized fragment	1	
	Garver's Ferry Corner Notched	2	
	Manker Stemmed	1	
	Otter Creek	1	
	Robbins	1	
	Snook Kill	2	
	Uniface, fragment	1	
Chert, unidentified N=		**17**	**47.2**
Hematite N=	**Ground stone, celt**	**1**	**2.8**
Not identified	Ground stone, Mortar	1	
	Grounstone, pestle	1	
Not identified N=		**2**	**5.6**
N=		**36**	**100.2**

Table 3.32. Study Collection Site 36BV13 (Circle on Rock Site) Projectile Point Raw Material by Time Period and Point Type				
Raw Material	**Time Period**	**Projectile Point Type**	**N=**	**% of Raw Material**
Chert, Onondaga	Early Archaic	Kirk Corner Notched	1	
	Middle Archaic, Late Archaic	Brewerton Side Notched	4	
	Late Archaic	Brewerton Corner Notched	2	
	Late Archaic, Terminal Archaic	Snook Kill	1	
	Terminal Archaic, Early Woodland	Orient Fishtail	1	
Chert, Onondaga N=			**9**	**42.9**
Chert, Ohio Flint Ridge (OFR) N=	**Early Woodland**	**Robbins**	**1**	**4.8**
Chert, unidentified	Early Archaic	Otter Creek	1	
	Middle Archaic, Late Archaic	Brewerton Side Notched	1	
	Late Archaic	Brewerton Corner Notched	1	
	Late Archaic, Terminal Archaic	Snook Kill	2	
	Early Woodland	Cresap Stemmed	2	
		Robbins	1	
	Middle Woodland	Garver's Ferry Corner Notched	2	
		Manker Stemmed	1	
Chert, unidentified N=			**11**	**52.4**
N=			**21**	**100.1**

The other chipped stone tools in the Site 36BV13 (Circle on Rock Site) assemblage included six examples each of bifaces and utilized flakes of various forms. The latter included a unifacial tool fragment in addition to general utilized flakes and a utilized blade-like flake. With the exception of the uniface, all of the use wear appears to be the result of expedient use.

The slightly smaller (n=151) assemblage from Site 36BV14 (Lower McMichaels Site; Carnegie FC E-214) contains ground stone, Archaic and Woodland points, various other chipped stone tools including drills, knives, and scrapers, two limestone tempered sherds, and four historic items. The focus of the study examination was on the projectile points (n=13; Figure D46) and chipped stone tools (n=14; Figure D47) (Table 3.33). The chipped stone tools include 11 biface examples and three utilized flakes. The latter include two examples of utilized, blade-like flakes. In general, the collection's raw materials include examples of confirmed or possible extralocal types. These include the rhyolite, OFR, the Upper Mercer / Cochocton, and the Kanawha-like examples. The presence of these materials in the site's collection is not unexpected as all of the material persist as minor components throughout the study collections.

Table 3.33. Study Collection Site 36BV14 (Lower McMichaels Site) Artifact and Raw Material Summary			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
Chert, local pebble (Kanawha-like) N=	**Biface, Stage 2 fragment**	**1**	**3.7**
Chert, Ohio Flint Ridge (OFR) N=	**Jack's Reef Corner Notched**	**1**	**3.7**
Chert, Onondaga	Brewerton Corner Notched	1	
	Brewerton Side Notched	3	
	Lamoka	2	
Chert, Onondaga N=		**6**	**22.2**
Chert, Onondaga - like	Biface, Stage 2	1	
	Flake, blade-like utilized	1	
Chert, Onondaga - like N=		**2**	**7.4**
Chert, Onondaga - like (LPC)	Biface, Stage 3	1	
	Flake, blade-like utilized	1	
Chert, Onondaga - like (LPC) N=		**2**	**7.4**
Chert, Onondaga (LPC) N=	**Biface, Stage 2**	**1**	**3.7**
Chert, unidentified	Backstrum	1	
	Biface, Stage 2	1	
	Biface, Stage 3	4	
	Brewerton Corner Notched	2	
	Jack's Reef Pentagonal	1	
	Manker Stemmed	1	
Chert, unidentified N=		**10**	**37.0**
Chert, Upper Mercer / Cochocton N=	**Flake, utilized**	**1**	**3.7**
Rhyolite N=	**Brewerton Side Notched**	**1**	**3.7**
Rhyolite - like N=	**Biface, Stage 3**	**2**	**7.4**
N=		**27**	**99.9**

The projectile points in the Site 36BV14 (Lower McMichaels Site) assemblage include Backstrum; the persistent Middle and Late Archaic Brewerton Side and Corner Notched types; Late Archaic Lamoka; Middle Woodland Manker Stemmed; Middle to Late Woodland / Late Prehistoric Jack's Reef Pentangonal; and Late Woodland / Late Prehistoric Backstrum (Table 3.34). As noted above, confirmed extralocal raw materials (OFR and rhyolite) are represented in the projectile point suite. These exotic materials occur as the Middle and Late Archaic Brewerton Side Notched and the Middle to Late Woodland Jack's Reef Corner Notched.

Alam collected close to 1000 items from Sites 36BV21 (Biscan Farm #1 Site) and 36BV22 (Boyscout Camp Site). The Site 36BV21 collection (Carnegie FC E-219; n=367) contains a Middle Archaic full-grooved axe in addition to other ground stone items; an assemblage of bifacial tools including Early to Late Archaic, Early to Late Woodland, and Late Prehistoric points; a single clay tempered ceramic fragment; a hawk bill; and two musket balls. The latter seem almost ubiquitous on the sites collected by Alam and whether or not their presence implies Protohistoric components at these various sites is unknown.

Table 3.34. Study Collection Site 36BV14 (Lower McMichaels Site) Projectile Point Raw Material by Time Period and Point Type				
Raw Material	**Time Period**	**Projectile Point Type**	**N=**	**% of Raw Material**
Chert, Onondaga	Middle Archaic, Late Archaic	Brewerton Side Notched	3	
	Late Archaic	Brewerton Corner Notched	1	
		Lamoka	2	
Chert, Onondaga N=			**6**	**46.2**
Chert, Ohio Flint Ridge (OFR) N=	**Middle Woodland into Late Woodland, Late Prehistoric**	**Jack's Reef Corner Notched**	**1**	**7.7**
Chert, unidentified	Late Archaic	Brewerton Corner Notched	2	
	Middle Woodland	Manker Stemmed	1	
	Middle Woodland into Late Woodland, Late Prehistoric	Jack's Reef Pentagonal	1	
	Late Woodland, Late Prehistoric	Backstrum	1	
Chert, unidentified N=			**5**	**38.5**
Rhyolite N=	**Middle Archaic, Late Archaic**	**Brewerton Side Notched**	**1**	**7.7**
N=			**13**	**100.1**

The examined collection from Site 36BV21 (Biscan Farm #1 Site; Table 3.35) focused on the broad suite of projectile points (Figures D48-D52), a smaller assemblage of chipped stone tools and utilized flake types (Figure D52), the aforementioned full groove axe (Figure D53), and two netsinkers (Figure D53). The chipped stone tools included whole and fragmentary drills; biface preforms, Stage 2 and 3 bifaces; and utilized primary, secondary, and fragmentary flakes. The full grooved axe is used but unpolished. It appears to have been undergoing rejuvenation when discarded as its surface is roughened and pecked. In contrast, the two netsinkers, again side varieties, show little modification other than the center notching.

Table 3.35 Study Collection Site 36BV21 (Biscan Farm #1 Site) Artifact and Raw Material Summary			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
Chert, Cochocton N=	**Levanna**	**1**	**1.4**
Chert, Kanawha N=	**Brewerton Corner Notched**	**1**	**1.4**
Chert, local pebble	Biface, Stage 2	1	
	Biface, Stage 3	3	
	Flake, primary utilized	2	
Chert, local pebble N=		**6**	**8.6**

Table 3.35 Study Collection Site 36BV21 (Biscan Farm #1 Site) Artifact and Raw Material Summary (continued)			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
Chert, Ohio Flint Ridge (OFR) N=	**Garver's Ferry Corner Notched**	**1**	**1.4**
Chert, Onondaga	Biface, Stage 2	1	
	Brewerton Corner Notched	11	
	Brewerton Side Notched	9	
	Drill, fragment	1	
	Madison	2	
Chert, Onondaga N=		**24**	**34.3**
Chert, Onondaga (LPC) N=	**Biface, Stage 2**	**1**	**1.4**
Chert, unidentified	Adena Stemmed	1	
	Biface, Stage 3	2	
	Brewerton Corner Notched	4	
	Brewerton Side Notched	7	
	Drill	2	
	Drill, fragment	1	
	Flake fragment, utilized	1	
	Fort Ancient	1	
	Garver's Ferry Corner Notched	2	
	Jack's Reef Pentagonal	1	
	Kiski Notched	1	
	Levanna	1	
	Madison	4	
	Manker Stemmed	1	
	Otter Creek	2	
Chert, unidentified N=		**31**	**44.3**
Chert, Upper Mercer / Cochocton N=	**Flake, secondary utilized**	**1**	**1.4**
Jasper-like N=	**Biface, Stage 2**	**1**	**1.4**
Not identified	Ground stone, axe (grooved)	1	
	Ground stone, Net Sinker	2	
Not identified N=		**3**	**4.3**
N=		**70**	**99.9**

The projectile point assemblage (Table 3.36) from the Biscan Farm #1 Site (36BV21) is dominated by Middle and Late Archaic Brewerton Side and Corner Notched examples (n=32; Figures D48-D50). As noted below on Table 3.36, the remaining points in the collection occur in appreciably fewer numbers. The assemblage, presented in alphabetical order, includes Adena Stemmed (Figure D50), Garver's Ferry Corner Notched (Figure D50), Jack's Reef Pentagonal (Figure D50), Kiski Notched (Figure D50), Levanna (Figure D51), Madison (Figures D51-D52), Manker Stemmed (Figure D50), and Otter Creek (Figure D48)

also present. Though the projectile point assemblage is large, much of the chert was unidentified as to source (Table 3.35). However, again Ohio Flint Ridge occurs as a Middle Woodland item, as does Kanawha in the Late Archaic.

Table 3.36. Study Collection Site 36BV21 (Biscan Farm #1 Site)
Projectile Point Raw Material by Time Period and Point Type

Raw Material	Time Period	Projectile Point Type	N=	% of Raw Material
Chert, Onondaga	Middle Archaic, Late Archaic	Brewerton Side Notched	9	
	Late Archaic	Brewerton Corner Notched	11	
	Late Woodland, Late Prehistoric	Madison	2	
Chert, Onondaga N=			**22**	**44.0**
Chert, Cochocton N=	**Late Woodland, Late Prehistoric**	**Levanna**	**1**	**2.0**
Chert, Kanawha N=	**Late Archaic**	**Brewerton Corner Notched**	**1**	**2.0**
Chert, Ohio Flint Ridge (OFR) N=	**Middle Woodland**	**Garver's Ferry Corner Notched**	**1**	**2.0**
Chert, unidentified	Early Archaic	Otter Creek	2	
	Middle Archaic, Late Archaic	Brewerton Side Notched	7	
	Late Archaic	Brewerton Corner Notched	4	
	Early Woodland	Adena Stemmed	1	
	Middle Woodland	Garver's Ferry Corner Notched	2	
		Kiski Notched	1	
		Manker Stemmed	1	
	Middle Woodland into Late Woodland, Late Prehistoric	Jack's Reef Pentagonal	1	
	Late Woodland, Late Prehistoric	Fort Ancient	1	
		Madison	5	
Chert, unidentified N=			**25**	**50.0**
N=			**50**	**100.0**

The large assemblage from the Boyscout Camp Site (36BV22; Carnegie FC E-220; n=603) includes two miscellaneous historic items, two bird claws, and a broad grouping of ground and chipped stone tools. Mayer-Oakes (1955:144, Plate 82) illustrates items he classifies as "Broad-stem points…highly polished crescent bannerstone…fragment of a three-quarter groove axe…rough beveled adz…five plain adzes". The 77 items (Table 3.37) in the study collection for the site included a large grouping of projectile points, the only example of a biface with hammerstone use observed in any of the collections, a biface perform, nine whole and fragmentary bifaces, and two secondary decortication flakes (unmodified) (Figure D59). The biface/hammerstone may represent a chopper tool or a tool

used as a mallet. While multifunctional bifaces are not uncommon, such bifaces usually do not function in ways that blunt their prepared edges. In this case, part of the lateral margins and the tip have been crushed.

Table 3.37. Study Collection Site 36BV22 (Boyscout Camp Site) Artifact and Raw Material Summary

Raw Material	Artifact Type	N=	% of Raw Material
Chert, Kanawha	Biface, Stage 3	1	
	Brewerton Side Notched	2	
	LeCroy Bifurcated Stem	1	
Chert, Kanawha N=		**4**	**5.2**
Chert, local pebble	Biface, Stage 2	2	
	Biface, Stage 3 fragment	1	
	Biface/Hammerstone	1	
	Flake, secondary decortication	1	
Chert, local pebble N=		**5**	**6.5**
Chert, Ohio Flint Ridge (OFR)	Early Woodland Stemmed	1	
	Manker Corner Notched	1	
	Robbins	1	
Chert, Ohio Flint Ridge (OFR) N=		**3**	**3.9**
Chert, Onondaga	Brewerton Corner Notched	2	
	Brewerton Side Notched	4	
	Early Woodland Stemmed	1	
	Late Archaic Stemmed	4	
	Otter Creek/Big Sandy	5	
	Stanly Stemmed	2	
	Unidentified, stemmed serrated	1	
Chert, Onondaga N=		**19**	**24.7**
Chert, Onondaga – like N=	**Biface, Stage 3**	**3**	**3.9**
Chert, unidentified	Adena Stemmed	2	
	Biface, Stage 2	3	
	Brewerton Corner Notched	5	
	Brewerton Side Notched	7	
	Kessell Side Notched	1	
	Kiski Notched	2	
	Late Archaic Stemmed	2	
	Otter Creek/Big Sandy	2	
	Steubenville Lanceolate	2	
	Steubenville Lanceolate (?)	1	
	Steubenville Stemmed	13	
	Steubenville Stemmed?	1	
Chert, unidentified N=		**41**	**53.2**
Jasper N=	**Orient/Dry Brook Fishtail**	**1**	**1.3**
Quartz N=	**Flake, secondary decortication**	**1**	**1.3**
N=		**77**	**100.0**

The projectile point assemblage from Site 36BV22 (Boyscout Camp Site) contains an exceptional suite of Otter Creek/Big Sandy projectile points (Figures D54, D58) and Steubenville Stemmed and Lanceolate examples (Figure D57; Table 3.38). Again, Brewerton Side and Corner Notched points types (Figures D54-D56) are present in high numbers.

Table 3.38. Study Collection Site 36BV22 (Boyscout Camp Site)
Projectile Point Raw Materials by Time Period and Projectile Point Type

Raw Material	Time Period	Projectile Point Type	N=	% of Raw Material
Chert, Onondaga	Early Archaic	Otter Creek/Big Sandy	5	
	Middle Archaic	Stanly Stemmed	2	
	Middle Archaic, Late Archaic	Brewerton Side Notched	4	
	Late Archaic	Brewerton Corner Notched	2	
		Late Archaic Stemmed	4	
	Early Woodland	Early Woodland Stemmed	1	
Chert, Onondaga N=			**18**	**28.6**
Chert, Kanawha	Early Archaic, Middle Archaic	LeCroy Bifurcated Stem	1	
	Middle Archaic, Late Archaic	Brewerton Side Notched	2	
Chert, Kanawha N=			**3**	**4.8**
Chert, Ohio Flint Ridge (OFR)	Early Woodland	Early Woodland Stemmed	1	
		Robbins	1	
	Middle Woodland	Manker Corner Notched	1	
Chert, Ohio Flint Ridge (OFR) N=			**3**	**4.8**
Chert, unidentified	Early Archaic	Kessell Side Notched	1	
		Otter Creek/Big Sandy	2	
	Middle Archaic, Late Archaic	Brewerton Side Notched	7	
	Late Archaic	Brewerton Corner Notched	5	
		Late Archaic Stemmed	2	
	Late Archaic, Terminal Archaic	Steubenville Lanceolate	2	
		Steubenville Lanceolate (?)	1	
		Steubenville Stemmed	13	
		Steubenville Stemmed?	1	
	Early Woodland	Adena Stemmed	2	
	Middle Woodland	Kiski Notched	2	
Chert, unidentified N=			**38**	**60.3**
Jasper N=	**Terminal Archaic, Early Woodland**	**Orient/Dry Brook Fishtail**	**1**	**1.6**
N=			**63**	**100.1**

Other projectile point types in the Site 36BV22 (Boyscout Camp Site) collection include Adena Stemmed (Early Woodland; Figures D56, D58), Early Woodland Stemmed (Figure D58), a possible Kessell Side Notched (Early Archaic; Figure D56), Kiski Notched (Middle Woodland; Figure D58), Late Archaic Stemmed (Figure D56), LeCroy Bifurcated Stem (Early and Middle Archaic; Figure D56), Manker Corner Notched (Middle Woodland; Figure D58), Orient/Dry Brook Fishtail (Terminal Archaic, Early Woodland; Figure D58), Robbins (Early Woodland; Figure D58), and Stanly Stemmed (Middle Archaic; Figure D56). When compared to other sites in the study collection, there is a low incidence of the use of Ohio Flint Ridge for the manufacture of Early Woodland and Middle Woodland projectile points. One of the rare instances of jasper use also occurs as a Terminal Archaic / Early Woodland Orient / Dry Brook projectile point. The fact that this style is commonly produced on jasper in eastern and central Pennsylvania suggests that the material choice may be linked in the maker's mind with style (Weed and Wenstrom 1992).

Site 36BV24 (Outdoor Theatre Site; Carnegie FC E-222) has an extensive artifact assemblage (n=1110). The site, based on the projectile point styles mentioned in the catalogue and earlier reviews by Mayer-Oakes (1955) and Lantz (1989), hosted occupations dating to all Archaic and Woodland periods except Terminal Archaic. Mayer-Oakes (1955:154) noted that the site "has a heavy Middle Woodland component as well as a Monongahela occupation." The ground stone and chipped stone subassemblages include items such as gorget fragments and both square and expanded base drills. In addition to the lithics, the collection contains grit, chert, limestone, and shell tempered ceramics, bone fragments, Portsmith fire clay pipe fragments, and historic artifacts.

The examined collection from the Outdoor Theatre Site (36BV24; Table 3.39) includes all of the projectile points present in the Carnegie collection (Figures D60-D63) and formal and expedient tools (Figures D64-D65). The projectile points, discussed below, ranged in age from Early Archaic to Late Woodland / Late Prehistoric. The other tools documented included bifaces (Figures D64-D65), a biface perform (Figure D65), a lamellar bladelet (Figure D64), drills (Figure D65), end scrapers and a hafted scraper (Figures D64-D65), and utilized flakes (Figures D64-D65). The lamellar bladelet may date to the Middle to Late Woodland.

Table 3.39. Study Collection Site 36BV24 (Outdoor Theatre Site)
Artifact and Raw Material Summary

Raw Material	Artifact Type	N=	% of Raw Material
Chert, Cochocton	Garver's Ferry Corner Notched	1	
	Jack's Reef Corner Notched	2	
	Madison	2	
Chert, Cochocton N=		**5**	**5.0**
Chert, Kanawha N=	**Cresap Stemmed**	**1**	**1.0**
Chert, Kanawha – like N=	**Scraper, end unifacial fragment**	**1**	**1.0**
Chert, local pebble	Biface	1	
	Biface, Stage 2	1	
	Biface, Stage 3	3	
	Drill, fragment proximal	1	
	Flake, primary decortication	1	
	Flake, primary decortication utilized	1	
	Flake, secondary decortication	2	

Table 3.39. Study Collection Site 36BV24 (Outdoor Theatre Site) Artifact and Raw Material Summary (continued)			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
	Flake, secondary utilized	1	
	Scraper, endscraper	1	
Chert, local pebble N=		**12**	**12.0**
Chert, Ohio Flint Ridge (OFR)	Chesser Notched	1	
	Lamellar Bladelet	1	
	Manker Stemmed	1	
	Scraper, endscraper	1	
Chert, Ohio Flint Ridge (OFR) N=		**4**	**4.0**
Chert, Onondaga	Adena Stemmed	4	
	Biface, Stage 2	1	
	Brewerton Corner Notched	1	
	Early Woodland Stemmed	3	
	Flake, secondary utilized	1	
	Garver's Ferry Corner Notched	1	
	Hamilton Incurvate	3	
	Jack's Reef Corner Notched	2	
	Madison	10	
	Raccoon Notched	3	
Chert, Onondaga N=		**29**	**29.0**
Chert, Onondaga – like N=	**Scraper, endscraper**	**1**	**1.0**
Chert, Onondaga - like (LPC) N=	**Biface, Stage 2**	**1**	**1.0**
Chert, Onondaga (LPC)	Biface	1	
	Flake, utilized	1	
Chert, Onondaga (LPC) N=		**2**	**2.0**
Chert, unidentified	Adena Stemmed	1	
	Biface, Stage 2	1	
	Biface, Stage 3	2	
	Brewerton Corner Notched	1	
	Brewerton Side Notched	1	
	Drill	2	
	Drill	1	
	Drill, fragment proximal	1	
	Early Woodland Stemmed	2	
	Flake, BTF utilized	1	
	Forest Notched	1	
	Garver's Ferry Corner Notched	3	
	Hamilton Incurvate	3	
	Kiski Notched	1	
	LeCroy Bifurcated Stem	1	
	LeCroy Side-Notched?	1	
	Madison	8	
	Manker Corner Notched	1	
	Otter Creek/Big Sandy	2	
	Raccoon Notched	3	
	Scraper, endscraper	2	
	Scraper, hafted	1	
	Susquehanna Broad	2	
Chert, unidentified N=		**42**	**42.0**
Rhyolite – like	Biface, Stage 3	1	
	Flake, primary	1	
Rhyolite - like N=		**2**	**2.0**
N=		**100**	**100.0**

The projectile point assemblage (Table 3.40) contains several examples each of Early Woodland Adena Stemmed (Figure D60) and Early Woodland Stemmed (Figure D60); Middle Woodland Garver's Ferry Corner Notched (Figure D61) and Raccoon Notched (including two examples with re-use; Figure D62); Middle Woodland to Late Woodland / Late Prehistoric Jack's Reef Corner Notched (Figure D62); and Late Woodland / Late Prehistoric Hamilton Incurvate (Figure D63) and Madison (Figure D63). Smaller numbers of Brewerton Corner Notched (Figure D60), Chesser Notched (Figure D61), Forest Notched (Figure D60), Kiski Notched (Figure D61), LeCroy Bifurcated Stem and a possible Side Notched example (Figure D60), Manker Corner Notched and Stemmed (Figure D61), Otter Creek/Big Sandy (Figure D60), and two possible Susquehanna Broad points (Figure D60) also were present. The time periods for these minor types are presented below on Table 3.40.

Table 3.40. Study Collection Site 36BV24 (Outdoor Theatre Site)
Projectile Point Raw Materials by Time Period and Point Type

Raw Material	Time Period	Projectile Point Type	N=	% of Raw Material
Chert, Onondaga	Late Archaic	Brewerton Corner Notched	1	
	Early Woodland	Adena Stemmed	4	
		Early Woodland Stemmed	3	
	Middle Woodland	Garver's Ferry Corner Notched	1	
		Raccoon Notched	3	
	Middle Woodland into Late Woodland, Late Prehistoric	Jack's Reef Corner Notched	2	
	Late Woodland, Late Prehistoric	Hamilton Incurvate	3	
		Madison	10	
Chert, Onondaga N=			**27**	**40.9**
Chert, Cochocton	Middle Woodland	Garver's Ferry Corner Notched	1	
	Middle Woodland into Late Woodland, Late Prehistoric	Jack's Reef Corner Notched	2	
	Late Woodland, Late Prehistoric	Madison	2	
Chert, Cochocton N=			**5**	**7.6**
Chert, Kanawha N=	**Early Woodland**	**Cresap Stemmed**	**1**	**1.5**
Chert, Ohio Flint Ridge (OFR)	Middle Woodland	Manker Stemmed	1	
	Late Woodland, Late Prehistoric	Chesser Notched	1	
Chert, Ohio Flint Ridge (OFR) N=			**2**	**3.0**
Chert, unidentified	Early Archaic	Otter Creek/Big Sandy	2	
	Early Archaic, Middle Archaic	LeCroy Bifurcated Stem	1	
		LeCroy Side-Notched?	1	
	Middle Archaic, Late Archaic	Brewerton Side Notched	1	
	Late Archaic	Brewerton Corner Notched	1	
		Susquehanna Broad	2	
	Early Woodland	Adena Stemmed	1	
		Early Woodland Stemmed	2	
		Forest Notched	1	
	Middle Woodland	Garver's Ferry Corner Notched	3	

Table 3.40. Study Collection Site 36BV24 (Outdoor Theatre Site) Projectile Point Raw Materials by Time Period and Point Type (continued)				
Raw Material	**Time Period**	**Projectile Point Type**	**N=**	**% of Raw Material**
		Kiski Notched	1	
		Manker Corner Notched	1	
		Raccoon Notched	3	
	Late Woodland, Late Prehistoric	Hamilton Incurvate	3	
		Madison	8	
Chert, unidentified N=			**31**	**47.0**
N=			**66**	**100.0**

The Site 36BV24 (Outdoor Theatre Site) projectile point assemblage is of some note. This collection displays a clear demarcation between Woodland-era exotic chert use and the use of the presumably local, but unidentified cherts. With a single exception, a Late Archaic Brewerton point, all of the points manufactured of presumed exotic chert date to the Woodland periods. This possible pattern could be the result of collection bias or it could reflect Adena and Hopewell interactions during the Early and Middle Woodland periods in particular.

The much smaller catalogued collection from Site 36BV26 (Kochanioski Site; Carnegie FC E-224; n=146) contains a full array of Archaic point styles, including bifurcates, and chipped stone diagnostics from both the Early and Middle Woodland. The presence of shell tempered sherds in the assemblage suggests a Late Woodland / Late Prehistoric component as well. A tubular bead fragment also is noted in the artifact inventory. The small assemblage of documented chipped stone tools and decortication flakes (Plate 68) included bifaces, drills, endscrapers, primary and secondary decortication flakes, and projectile points (Table 3.41).

The projectile points in the examined collection (Table 3.42) are dominated by Archaic types of various styles. The collection also contains four Woodland types and a possible Paleoindian Plano Lanceolate point (Figure D66). The point is damaged and a positive identification is not possible. The Archaic assemblage includes Early Archaic Kirk Corner Notched (Figure D66), Early and Middle Archaic LeCroy Bifurcated Stem (Figure D66), Middle Archaic Stanly Stemmed (Figure D66), Middle and Late Archaic Brewerton Side Notched (Figure D66-67) and Brewerton Corner Notched (Figure D67), and Late Archaic Stemmed (Figure D67). The Woodland items include Early Woodland Stemmed (Figure D67) and Robbins (Figure D67) in addition to Middle Woodland Garver's Ferry Corner Notched (Figure D67) and Kiski Notched (Figure D67). There are no appreciable patterns between time period and raw material utilized or between point type and raw material. The Brewerton points are being produced of both exotic and local materials, perhaps suggesting the exotic materials are more readily available than might be expected.

Table 3.41. Study Collection Site 36BV26 (Kochanioski Site) Artifact and Raw Material Summary			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
Chert, Kanawha	Brewerton Side Notched	1	
	Early Woodland Stemmed	1	
	Otter Creek/Big Sandy	1	
Chert, Kanawha N=		**3**	**8.1**
Chert, Kanawha – like	Biface, Stage 2	1	
	Biface, Stage 3	1	
Chert, Kanawha - like N=		**2**	**5.4**
Chert, local pebble	Biface, Stage 2	3	
	Flake, primary decortication	1	
	Flake, secondary decortication	2	
	Scraper, endscraper	1	
Chert, local pebble N=		**7**	**18.9**
Chert, Ohio Flint Ridge (OFR) N=	**Robbins**	**1**	**2.7**
Chert, Onondaga	Brewerton Corner Notched	1	
	Brewerton Side Notched	6	
	Late Archaic Stemmed	3	
	Plano Lanceolate?	1	
Chert, Onondaga N=		**11**	**29.7**
Chert, Onondaga - like	Drill, fragment	1	
	Scraper, endscraper	1	
Chert, Onondaga - like N=		**2**	**5.4**
Chert, unidentified	Biface, Stage 3	1	
	Brewerton Side Notched	1	
	Drill	1	
	Drill, fragment	1	
	Garver's Ferry Corner Notched	1	
	Kirk Corner Notched	1	
	Kiski Notched	1	
	Late Archaic Stemmed	1	
	LeCroy Bifurcated Stem	1	
	Scraper, endscraper fragment	1	
	Stanly Stemmed	1	
Chert, unidentified N=		**11**	**29.7**
N=		**37**	**99.9**

Table 3.42. Study Collection Site 36BV26 (Kochanioski Site) Projectile Point Raw Material by Time Period and Point Type				
Raw Material	**Time Period**	**Projectile Point Type**	**N=**	**% of Raw Material**
Chert, Onondaga	Paleoindian	Plano Lanceolate?	1	
	Middle Archaic, Late Archaic	Brewerton Side Notched	6	
	Late Archaic	Brewerton Corner Notched	1	
		Late Archaic Stemmed	3	
Chert, Onondaga N=			**11**	**50.0**
Chert, Kanawha	Early Archaic	Otter Creek/Big Sandy	1	
	Middle Archaic, Late Archaic	Brewerton Side Notched	1	
	Early Woodland	Early Woodland Stemmed	1	
Chert, Kanawha N=			**3**	**13.6**
Chert, Ohio Flint Ridge (OFR) N=	**Early Woodland**	**Robbins**	**1**	**4.5**
Chert, unidentified	Early Archaic	Kirk Corner Notched	1	
	Early Archaic, Middle Archaic	LeCroy Bifurcated Stem	1	
	Middle Archaic	Stanly Stemmed	1	
	Middle Archaic, Late Archaic	Brewerton Side Notched	1	
	Late Archaic	Late Archaic Stemmed	1	
	Middle Woodland	Garver's Ferry Corner Notched	1	
		Kiski Notched	1	
Chert, unidentified N=			**7**	**31.8**
N=			**22**	**99.9**

The final site in the Alam Beaver County grouping is the McDowell Site (36BV38: Carnegie FC E-230; n=52). This site had the smallest collection in the grouping (n=52). It was specifically chosen because the catalog indicated the presence of Paleoindian and Archaic items in the assemblage. Except for a fossilized crinoid stem and the fragment of an iron spoon, all of the items in the inventoried collection are chipped stone including a "complete Paleo flinted [sic] point" and complete and fragmentary examples of side-notched, corner-notched, and expanded stem Archaic points. The documented portion of the collection (Table 3.43) included the noted Archaic projectile points (Figures D69-70) in addition to Woodland point, and bifaces, a utilized flake, and end scrapers (Figure D70). The Paleoindian point is no longer in the collection.

Table 3.43. Study Collection Site 36BV38 (McDowell Site) Artifact and Raw Material Summary			
Raw Material	**Artifact Type**	**N=**	**% of Raw Material**
Chert, Kanawha – like	Biface, Stage 2	1	
	Scraper, endscraper	1	
Chert, Kanawha - like N=		**2**	**7.7**
Chert, local pebble	Brewerton Eared Notched	1	
	Kiski Stemmed	1	
	Scraper, endscraper	1	
Chert, local pebble N=		**3**	**11.5**
Chert, Onondaga	Brewerton Eared Notched	1	
	Brewerton Side Notched	3	
	Kirk Corner Notched	1	
	Robbins	1	
	Steubenville Stemmed	2	
Chert, Onondaga N=		**8**	**30.8**
Chert, Onondaga – like N=	**Biface, Stage 3**	**1**	**3.8**
Chert, unidentified	Adena Stemmed	1	
	Biface, Stage 3	2	
	Biface, Stage 3 fragment	1	
	Brewerton Side Notched	2	
	Cresap Stemmed	1	
	Early Woodland Stemmed	1	
	Flake, utilized	1	
	Kiski Notched	1	
	Otter Creek/Big Sandy	1	
	Snook Kill	1	
Chert, unidentified N=		**12**	**46.2**
N=		**26**	**100.0**

The projectile point collection still present at the Carnegie Museum and documented for this study (Table 3.44) included both Archaic and Woodland types. The Archaic assemblage consisted of Early Archaic Kirk Corner Notched (Figure D69) and Otter Creek/Big Sandy (Figure D69); Middle to Terminal Archaic Brewerton Side Notched and Eared Notched (Figures 69-70); and Late and Terminal Archaic Snook Kill (Figure D69) and Steubenville Stemmed (Figure D69). The Woodland grouping is comprised of Early Woodland Adena Stemmed (Figure D69), Cresap Stemmed (Figure D69), Early Woodland Stemmed (Figure D69), and Robbins (Figure D69); and Middle Woodland Kiski Stemmed (Figure D69-D70). There are no exceptional patterns to the raw materials used by time period or by point type. As observed throughout the study collections, there appears to be selection for high quality materials that will meet the configuration specifications for the type under production.

Table 3.44. Study Collection Site 36BV38 (McDowell Site) Projectile Point Raw Materials by Time Period and Projectile Point Type				
Raw Material	**Time Period**	**Projectile Point Type**	**N=**	**% of Raw Material**
Chert, Onondaga	Early Archaic	Kirk Corner Notched	1	
	Middle Archaic, Late Archaic	Brewerton Side Notched	3	
	Late Archaic	Brewerton Eared Notched	1	
	Late Archaic, Terminal Archaic	Steubenville Stemmed	2	
	Early Woodland	Robbins	1	
Chert, Onondaga N=			**8**	**44.4**
Chert, local pebble	Late Archaic	Brewerton Eared Notched	1	
	Middle Woodland	Kiski Stemmed	1	
Chert, local pebble N=			**2**	**11.1**
Chert, unidentified	Early Archaic	Otter Creek/Big Sandy	1	
	Middle Archaic, Late Archaic	Brewerton Side Notched	2	
	Late Archaic, Terminal Archaic	Snook Kill	1	
	Early Woodland	Adena Stemmed	1	
		Cresap Stemmed	1	
		Early Woodland Stemmed	1	
	Middle Woodland	Kiski Notched	1	
Chert, unidentified N=			**8**	**44.4**
N=			**18**	**99.9**

Study Collection Summary

The study collections included 1041 items. Of this total, 21 were ground stone and the remainder (N=1020) were chipped stone tools or detritus. Of the tools, 434 were whole or fragmentary projectile points. The chipped stone and projectile point raw material summary is presented on Table 3.45. This summary was specifically prepared to see if the raw materials, in general, used in the manufacture of projectile points differed appreciably from those of the total collection. The comparative percentages are calculated only for the raw materials types represented in the projectile point suite.

Table 3.45. Study Collection Chipped Stone and Projectile Point Raw Material Comparison				
Raw Material	**All Items N=**	**% of All Items**	**Projectile Points only N=**	**% of Projectile Points only**
Chert, Cochocton	10	0.98	9	2.07
Chert, Kanawha	18	1.76	17	3.92
Chert, Kanawha - like	7	0.69		
Chert, local pebble	258	25.29	13	3.00
Chert, local pebble (Kanawha-like)	1	0.10		
Chert, Monongahela	3	0.29		
Chert, Monongahela (with heavy patination)	1	0.10		
Chert, Ohio Flint Ridge (OFR)	29	2.84	14	3.23
Chert, Ohio Flint Ridge?	2	0.20		
Chert, Onondaga	174	17.05	151	34.79
Chert, Onondaga - like	25	2.45	5	1.15
Chert, Onondaga - like (LPC)	9	0.89		
Chert, Onondaga (LPC)	34	3.33		
Chert, Onondaga (no cortex)	11	1.08		
Chert, Ten Mile - like	1	0.10		
Chert, Ten Mile (no cortex)	1	0.10		
Chert, Ten Mile?	1	0.10		
Chert, Three Mile Creek	1	0.09	1	0.23
Chert, unidentified	373	36.57	215	45.54
Chert, unidentified (patinated)	1	0.10		
Chert, unidentified (no cortex)	23	2.25	3	0.69
Chert, unidentified (no cortex), Uniontown-like	1	0.10		
Chert, unidentified (weathered cortex)	11	1.08	1	0.23
Chert, Uniontown	3	0.24		
Chert, Uniontown (some patination)	1	0.10	1	0.23
Chert, Uniontown (weathered cortex)	1	0.10		
Chert, Uniontown-like (LPC)	1	0.10		
Chert, Upper Mercer / Cochocton	2	0.20		
Jasper	3	0.29	2	0.46
Jasper-like	2	0.20		
Metaquartzite	3	0.29		
Metaquartzite (LPC)	1	0.10		
Quartz	1	0.10		
Rhyolite	2	0.20	2	0.46
Rhyolite - like	5	0.49		
Grand Total	1020	100.0	434	100.00

Four observations cam be made from the comparison. First, the presumably non-local stone types (Cochocton, Kanawha, OFR, Three Mile Creek, Jasper, and Rhyolite) occur most often in the collections as projectile points. Second, confirmed local pebble chert appears to be selected less often for projectile point manufacture than for the manufacture of other chipped stone types. This selection may be a function of average pebble size. Or, the observation may be spurious, as cortical rind (the hallmark of local pebble chert) is often completely removed in the tool making process. Third, Onondaga chert occurs in about equal proportions, suggesting that Onondaga is readily available, probably entering the region as glacial lag. Finally, a very high percentage of both assemblages are made on unidentified cherts. The physical characteristics of these cherts and their possible source locations are not discussed with any consistency in the reviewed literature. It would seem that an avenue for further research in the region, and at Site 36AL480 specifically, should be spectrographic examination of these cherts to establish baseline parameters for classification.

Functional Type Definitions

The focus of the collections review was on the following artifact subsets: projectile points, biface preforms, decortication flakes, and utilized flakes. These subsets were chosen for a variety of reasons. Utilized flakes were likely created on-site. Decortication flakes also may have been created on-site if the full spectrum of lithic reduction was being conducted. In contrast, projectile points and biface preforms might have been produced either on- or off-site but were considered likely to display the broadest range of raw materials in a collection.

It was not within the SOW to reanalyze collections. Rather, the idea was to focus on selected chipped stone classes that might result in identification of raw material use patterns and inconsistent uses of terminology or typologies. The raw material patterns were discussed above. As for terminology and typologies, there was little inconsistency. Perhaps the most inconsistent use of typology occurred because of region-specific point classification. Thus, types like Late Archaic Merom/Trimble were identified in Ohio and West Virginia references but not called out in Pennsylvania where the form is typically classed as Late Archaic Stemmed.

The whole and mostly whole projectile points and other bifacial tools from the 16 sites in the collection sample were subjected to metric, material, and typological description. Cores, items classifiable as primary decortication flakes (but not necessarily listed as such in the site catalogs), and utilized flakes (based on the investigator's catalogs) also were examined for material type. Cores and primary decortication flakes were not measured. Utilized flakes were measured if the item was clearly complete. A selected number of ground stone items in some of the Alam collections were chosen for illustration and recordation. This category of artifacts is routinely underreported and it was considered valuable to see the range of such artifact types present in the Alam collections in particular.

In the collection examination, the artifact type definitions presented on Table 3.46 were used.

Table 3.46 Functional Type Definitions			
Group	**Type**	**Definition**	**Reference**
Cores, flake (also core)	Free hand, Multidirectional, Discoidal	specifically prepared for the purpose of obtaining flakes as an end product. These cores contain flake scars removed in an unsystematic manner and lack a specially prepared platform	
Checked pebble	Same as Group	Raw material, usually with cortical rind, exhibiting casual flake removal. Piece is tested for material type.	
Flake	Primary decortication	Primary decortication flakes retain cortex on 100 percent of their dorsal face.	
	Secondary decortication	flakes that retain cortex on 30 to 99 percent of the dorsal face and that exhibit one or more dorsal scars from previously detached flakes.	
	Bipolar	The result of direct and indirect percussion flake removal. Bipolar knapping is commonly used to smaller and rounder stones (such as pebble and small cobbles).	Bordaz 1970
	Utilized	expedient utilization (marked by irregular edge removals) or systematic retouch. It should be noted that biface-reduction flakes are susceptible to edge damage and this damage can give the appearance of utilization (Kelly 1988:724).	
Biface	Stage 1	raw material in the form of a blank. This blank may be in the form of a cobble, nodule, or flake.	Callahan (1979, 1991)
	Stage 2	bifacially worked blank with a width to thickness ratio of 2.0 or more, where there has been edging without shaping. The edge of a Stage II biface is sinuous.	Callahan (1979, 1991)
	Stage 3	exhibit initial shaping and thinning and have a lenticular cross-section with a width to thickness ratio of 3.0 or more. For success to be achieved at this point in the reduction process, most major humps, step fractures, hinges or other defects usually have been eliminated. Flake scars meet or overlap at the center of bifaces included in Stage III.	Callahan (1979, 1991)
	Stage 4 (or perform)	exhibit a flattened cross-section with a width to thickness ratio of 4.0 or more. These bifaces are nearly in their final form and edges have been prepared for hafting elements.	Callahan (1979, 1991)

Table 3.46 Functional Type Definitions (continued)			
Group	**Type**	**Definition**	**Reference**
Blade	Blade, bladelet, blade-like	Blades made from long, relatively thin, parallel-sided flakes. Usually twice as long as wide. Bladelets are shorter and narrower; may not exceed 2 in long and ½ in wide. Blade-like flakes are similar in configuration to blades but are not prepared from polyhedral or prismatic cores.	Bordaz 1970
Drill		A tool for making perforations. "Bases are varied with straight based drills (no expansion), expanded base drills, and T-shaped drills." Drills may be hafted and, like other unifacial and bifacial tools, are sometimes created on expended or fragmented projectile points.	McMichael 1968:64
Scraper	Bifacial	End and side scrapers are usually plano-convex in cross section. Formed scrapers will have unifacial, bifacial, or unifacial/bifacial edge treatment. Scrapers also can be expedient without systematic flake removal on the edge.	Black 1967, McMichael 1968
	End		
	Unifacial		
	Unspecified		
Pecked stone	Hammerstone	Unspecialized tool usually without formal preparation. Scarring resulting from use as a hammer will be present on one or more ends. Pitted hammerstones have one or more pits on one or more sides.	McMichael 1968

Informant Interviews

As part of the data collection process, interviews were conducted with experts in the region. Five of the interviews (Joseph Baker, Christopher Bergman, Verna Cowin, Richard George, James Herbstritt), were completed in person, and the remainder were conducted on the telephone (Appendix E, Table E.1). In all cases the interviewer was Carol Weed. The in-person interviews were held in Cincinnati, Harrisburg, and Pittsburgh, and the telephone interviews were held from Weed's office in Cincinnati.

The interviews were informal, but structured to solicit information about previous research results in the study area, specific time periods and site types, specific lithic sources and types, and research avenues that should be explored by future research in the region. One of the primary goals of the interviews was to secure leads and information on site-specific artifact collections that could provide comparative data for use in the interpretation of Site 36AL480 data. The interview notes are presented following Table E.1 in Appendix E

but results pertinent to specific discussions are presented in the collections and time period discussions. Highlights of the interviews included:

- Baker (2001) offering suggestions as to which local members of the SPA might supply information on site distribution in the study basin;

- Bergman (2001, 2002) discussing the results of the Hardlines excavations at Site 36AL480 during 2000 and for clarifying questions generated by the review of Sandts Eddy (Site 36NM12) materials;

- Cowin (2001, 2002) clarifying Middle Archaic temporal divisions based on projectile point types and providing additional background to the excavations at State Road Ripple;

- George (2001) providing insight into projectile point variants that he, and others, had defined for the region. Also, additional background into the use of non-local cherts, in particular OFR;

- Herbstritt (2001) suggestion that Dr. Robert Smith (2001) might provide valuable insight into chert types for the area; and

- Nass (2001) providing suggestions as to additional sources of information concerning site distribution in the study area on the Ohio side of the river.

PREHISTORIC AND PROTOHISTORIC CONTEXTS

In the following sections, each of the area time periods is discussed. The period discussions are supported by a series of tables. These tables are based on data in the PHMC and OHPO study area databases and in the database resulting from the study collection examination. Several editorial points need to be made about data presentation and table-specific data.

- B.C./A.D. and B.P. dates are presented only if both sets of dates were listed in the original source. Period bracketing dates are presented as B.C./A.D. dates because the common references for the area use these date conventions.

- No UTM or other absolute site location data were provided by either PHMC or OHPO because of site location confidentiality concerns. Thus, if the site database did not contain information on distance to water or topographic setting that data could not be reconstructed as the location of the site was unknown.

- As regards distance to water data, many of the PHMC sites had distance to water presented as ‘0’. The use of zero apparently implies either the site was immediately adjacent to water or that the distance was not coded. For the purposes of this study, it is assumed that zero distance was 100 meters or less.

- On tables listing projectile point metric data, any bolded and italicized entry denotes measurement on a fragmented piece.

- On tables listing projectile point data, the term “OL” references Object Length.

- On tables listing projectile point data, empty cells contained no information.

Paleoindian (14,000 B.C. – 8000 B.C.)

The Paleoindian period in the study region, as elsewhere in North America, is marked by a small data pool of sites (n=84; 35 in Pennsylvania) that provides tantalizing insights into the cultural characteristics of the era. Most of the hard data concerning this stage in the study region results from the work completed at Meadowcroft Rockshelter (36WH297; Adovasio et al. 1998 for summary). Two other stratified sites with Paleoindian components are known in the general region. Lantz (1985:165), who does not reference the site designations, reports one as a rockshelter, located in Armstrong County, and the other as an open, spring site in Westmoreland County (also Boyd et al. 1998a). Neither of these sites, however, are known to have been subjected to systematic investigation.

George (1987:3, Table 1) lists a Paleoindian component at Site 36WH1017 (the Morgan Paleo Site) but does not discuss the site except to note in his Table 1 that the closest water source is a spring about 393 m (1190 ft) from the site. Site 36ME24 (the Big Bend Site), also cited by Lantz (1985:165), had yielded eight Paleoindian projectile points as of Lantz's 1985 summary. This site also has not been investigated further. Six sites (36SO60, 36SO62, 36SO63, 36SO184, 36SO185, and 36SO210) within and in the vicinity of the Meyersdale Bypass Project in Somerset County, Pennsylvania, yielded surface or mixed context Paleoindian diagnostics (Boyd et al. 1998a). Phase II testing at Site 36SO62 failed to reveal intact occupational evidence for the Paleoindian (Boyd et al. 1998a). For these reasons, significant gaps remain in all five research domains for the UOV.

For the Appalachian Plateau in general the sample of investigated sites is larger, but certainly cannot be characterized as robust. The most intensively investigated of the sites in this sample is Shawnee Minisink (Site 36MR43) in the Delaware River drainage (Dent and Kauffman 1985; Kaufmann and Dent 1982; McNett 1985). Nearby, but not on the Plateau, is Dutchess Quarry Cave in the Hudson River uplands of New York (Funk et al. 1970). Also off the Plateau and to the south of it are the early occupations of the Flint Run Complex, which are defined at the Thunderbird and Fifty sites in the Potomac drainage (Gardner 1979, 1983). To the west, and just off of the Plateau in Ohio is the Welling Site (33Co2), in Coshocton County, Ohio. To the north and northwest are a group of sites in western New York and southern Ontario. This grouping includes Holcombe in eastern Michigan (Fitting et al. 1966); Fisher (Storck 1983) and Debert (MacDonald 1968) in southern Ontario; and the Potts Site in southwestern New York (Ritchie 1957).

Cultural Chronology

Lantz' (1985) treatment of the Paleoindian period (14,000 B.C.-8000 B.C.) in conjunction with Adovasio's (1983) summary for the journal *Archaeology of Eastern North America* (AENA) Fluted Point Survey volume provides baseline documentation for the period in the study area. Lantz (1985:170) indicates that 216 Paleoindian sites are known in his larger, 23-county western Pennsylvania study region. Almost all of components in the Leetsdale sample and in the Lantz summary represent surface finds or stray Paleoindian diagnostics found in more recent cultural deposits.

As far as can be determined, no pure Paleoindian component has been defined in the region (including eastern Ohio, western Pennsylvania, southwestern New York, and the panhandle of West Virginia) since Meadowcroft Rockshelter (Site 36WH297) was investigated. In total, and within the Pennsylvania and Ohio study areas covered in this study, 84 Paleoindian components have been reported. Of this number, 35 sites occur in the Subbasin 20 PASS sample and 20 of these are located within 100 m of a permanent water source (Table 3.47).

The relative Paleoindian chronology presented on Table 3.48 is based almost exclusively on changes in biface forms and projectile point styles. The tripartite division of Early, Middle (or Mid-), and Late Paleoindian appears to have some basis in reality, as absolute dates from the eastern United States support the contention that Clovis or Clovis-like points (Early Paleoindian) pass from the record once Folsom points (Middle Paleoindian) begin to be manufactured. Similarly, the Folsom points are replaced by points of the Hardaway and Dalton series during the Late Paleoindian. Some investigators (Custer 1996) consider these latter point types to represent more general use styles and their presence indeed may herald the true onset of a diversified Archaic subsistence strategy (Custer 1984; Gardner 1983; McNett et al. 1977).

Turning to the available radiometric dates for the study area and region, the data set is limited. While the Meadowcroft Rockshelter (Site 36WH297) radiometric assays from lower and middle Stratum IIa are accepted, after much discussion, by many investigators as representing "evidence for the presence of pre-Clovis/pre-fluted point human populations east of the Mississippi River..." (Adovasio 1983:8), the radiometric results from deposits in upper Stratum IIa bracket the traditionally accepted Paleoindian onset. Adovasio et al. (1998:319-320) indicate that Meadowcroft's Miller complex "appears to represent the pioneer population in the upper Ohio Valley and, possibly, the Northeast." The Miller Lanceolate point from Meadowcroft Rockshelter (Site 36WH297) was recovered from deposits dating between "10,850$\pm$870 B.C. (12,800 B.P.) and 9350 $\pm$ 700 B.C. (11,300 B.P.)". No other absolute Paleoindian dates are known from the study area, although an early date of 10,180$\pm$100 B.P. (10,625-10,570 / 10,420-9365 B.C. on bulk sediment; see Appendix I) was obtained on organics recovered in Stratum 2Btx, Trench 4-3, at Site 36AL480 (Vento et al. 2002). This date is not associated with diagnostics or identified occupation planes.

Table 3.47. PASS (Subbasin 20) Paleoindian Components Within 100 M of Permanent River								
Site	**Site Type**	**Sub-basin 20 Watershed**	**Major Stream**	**Distance (m) to Major Stream**	**Minor Stream**	**Distance (m) to Minor Stream**	**Topographic Setting**	**Period, phase**
36AL169	Open habitation	G	Ohio River	70	Sewickley Creek	120	Floodplain	Paleoindian, late
36BT54	Open habitation	C	Ohio River	90	Beaver River	200	Terrace	Paleoindian, early
36BT73	Open unknown function	C	Slippery Rock Creek	20	Brush Creek	340	Terrace	Paleoindian, early
36BT75	Open unknown function	C	Ohio River	50	Beaver River	320	Rise in Floodplain	Paleoindian
36BT80	Open habitation	C	Ohio River	80	Beaver River	120	Terrace	Paleoindian, early
36BV26	Open habitation	D	Ohio River	60	Raccoon Creek	120	Stream Bench	Paleoindian
36BV38	Open habitation	D	Ohio River	0	Raccoon Creek	220	Stream Bench	Paleoindian
36BV67	Open unknown function >20m radius	C	Slippery Rock Creek	30	Connoquenessing Creek	60	Floodplain	Paleoindian
36BV201	Open habitation	B	Ohio River	0	Beaver River	20	Stream Bench	Paleoindian
36CW294	Isolated Find	A	Shenango River	100	Neshannock River	660	Terrace	Paleoindian, early
36GR43	Open habitation	E	Ohio River	10	Wheeling Creek	60	Terrace	Paleoindian
36LR67	Open unknown function >20m radius	A	Shenango River	60	Neshannock River	200	Terrace	Paleoindian, early
36LR77	Open unknown function >20m radius	B	Ohio River	60	Mahoning River	80	Floodplain	Paleoindian, late
36LR78	Open unknown function >20m radius	B	Ohio River	60	Mahoning River	110	Stream Bench	Paleoindian, late
36LR79	Open unknown function >20m radius	C	Slippery Rock Creek	0	Connoquenessing Creek	140	Floodplain	Paleoindian, early
36LR193	unspecified	B	Ohio River	0	Mahoning River	0	Saddle	Paleoindian, early
36ME24	Open habitation	A	Shenango River	80	Neshannock River	120	Terrace	Paleoindian, early
36WH297	Rock Shelter/ Cave	D	Ohio River	60	Raccoon Creek	400	Terrace	Paleoindian, middle
36WH1050	Open unknown function	F	Ohio River	0	Chartiers Creek	200	Hill Ridge/ Toe	Paleoindian
36WH1119	Isolated Find	F	Ohio River	0	Chartiers Creek	0	Floodplain	Paleoindian, early

Table 3.48. Accepted Paleoindian Phase Assignments Based On Projectile Point Styles And Relative Radiometric Assays		
Temporal Phase	**Projectile Point or Biface**	**Radiometric Range (based on Gardner 1983:49)**
Paleoindian, Late / Early Archaic	Hardaway, Dalton	8000-8500 B.C.
Paleoindian, Mid (or Middle)	Folsom, Folsom-like	8500-9000 B.C.
Paleoindian, Early	Plano, Clovis	9000-9500 B.C.

In the larger region, the absolute dates seem to provide a similar occupational range. Funk et al. (1969) reported a bone collagen date of 10,580 B.C. (12,530±370 B.P.) for Dutchess Quarry Cave, No. 1, but this date is suspect because of possible water contamination (Funk 1983). Further, the dated material was not in direct association with the Cumberland-like projectile point that marks the Paleoindian occupation at the cave. The Shawnee Minisink Site (36MR43) dates of 10,750±600 B.P. and 10,590±300 B.P. are certainly within an acceptable Paleoindian range; however, the dates are more in line with late Paleoindian and/or Early Archaic than the recovered Clovis point would suggest (Custer 1996; McNett 1985; Ritchie 1983). To date, the paramount issue as regards absolute dates from Paleoindian occupations has been the general lack of organic-based materials suitable for radiometric assays.

Site Settlement Patterns

It is common to begin any discussion of Paleoindian settlement patterns by noting that the Paleoindian population was small, mobile, and widely dispersed. Certainly, the population size was smaller than in succeeding Archaic and Woodland times. But, it is not necessarily likely that the population was any more mobile than the subsequent Archaic or Woodland ones.

In western New York, most of the evidence for Paleoindian presence has been discovered as surface finds, located on hills or knolls along major drainages (Ritchie 1980). Ritchie (1980) postulated that the Paleoindian settlement strategy in western New York focused on elevated locations, such as those provided by glacially deposited moraines, hilltops, and ridges. A number of the western New York sites occur on the edges of marshes and the margins of what had been lakes.

In Pennsylvania, Lantz (1985:175) concluded that most of the Paleoindian sites, including isolated finds, were occurring in the once-glaciated area of the region rather than the unglaciated segment of the Appalachian Plateau in western Pennsylvania. This conclusion, however, is not supported by the PASS (Subbasin 20) data as sites in both unglaciated and glaciated counties are represented. The OHPO (Leetsdale) database contains reference to 33 Paleoindian components. These also occur in both glaciated and unglaciated counties.

Regardless of the sites' setting relative to the glaciated versus unglaciated areas of the plateau, Lantz (1985) noted a decided preference for siting on first or second order streams,

particularly "on small headwater runs" (Lantz 1985:177). However, the study area data seems to indicate that lowland and upland settings are about equally preferred through all Paleoindian phases (Table 3.49).

Table 3.49. PASS (Subbasin 20) Paleoindian Landform, Topographic Setting, and Associated Projectile Points

Landform	Topographic Setting	Associated Projectile Points	N=	% of Base N=
Lowland	Floodplain	Clovis	2	
		Late Paleo (Plano)	1	
		Mid-Paleo (Folsom)	2	
	Terrace	Clovis	6	
		Late Paleo (Plano)	1	
		Pre-Clovis	1	
Lowland N=			**13**	**54.1**
Upland	Hill Ridge/ Toe	Clovis	1	
	Hilltop	Clovis	1	
		Late Paleo (Plano)	1	
	Middle Slopes	Clovis	2	
	Ridgetop	Clovis	1	
	Saddle	Hardaway-Dalton	1	
	Stream Bench	Clovis	2	
		Plano Lanceolate(?), (Plate D66)	1	
	Upper Slopes	Clovis	1	
Upland N=			**11**	**45.8**
Base N=			**24**	**99.9**

Overall, the available temporal data indicate that the study region was actively utilized from Clovis times (about 9500 B.C.) onward and, based on the Meadowcroft Rockshelter (Site 36WH297) data, also possibly during pre-Clovis times (Adovasio 1983; Adovasio et al. 1998). What exactly the utilization consisted of, however, remains elusive for these early, middle and late phases. The importance of the work at Meadowcroft Rockshelter (Site 36WH297) cannot be overstated in terms of environmental reconstruction and subsistence and seasonality studies. Yet, the Meadowcroft (Site 36WH297) data are from a specialized site type (a rockshelter) and the niche that rockshelter occupations filled in the larger settlement network is not necessarily completely understood.

The systematic surveys conducted in the Cross Creek drainage (Adovasio et al. 1998) were directed to issues of settlement patterns and exploitation regimes, but the resultant picture remains unfocused. The prehistoric sites identified during the 1973-1978 Cross Creek drainage survey included bivouac/transitory occupations, base camps, isolated finds, villages, and mounds. Of the 236 archaeological sites identified, 22 percent (n=52) yielded temporal diagnostics assignable to "76 discrete components." The components were separable as follows: Paleoindian (n=8), Archaic (n=35), and Woodland (n=33). Thus, while all the temporal components present at Meadowcroft Rockshelter also are represented in the areal sample, the relationship of occupations of the same time to one another remains elusive.

No Paleoindian sites in the study area have been defined as either villages or large, open campsites. Lantz (1985:173) indicates that there are three major camp sites in Warren County, however this is outside the study region though on the Plateau. Adovasio (1983) characterizes the occupations at Meadowcroft Rockshelter (Site 36WH297) as probably something like a short-term camp. Whether or not bands came together in season-specific groupings is unknown in the region. However, immediately outside of the study area Seeman (1994) reports possible evidence for such aggregation at the Nobles Pond site (Site 33ST357). At that location, in the so-called South Field segment of the site, there were clusters of chipped stone that appear to represent the residue of concurrent chipping reduction episodes. Seeman (1994) interprets the combined data as evidence for aggregated procurement behavior.

Funerary remains also are virtually unknown. Deller and Ellis (1984) reported on a possible Paleoindian crematory at the Crowfield Site (no site number known) located in southern Ontario. This site, however, lacks indications that it also served as a seasonal encampment or residential location of any type. Site type interpretations, in general, have been hindered by a virtual absence of formal features that could form bases for site function conclusions. The Debert, Fifty, Meadowcroft Rockshelter (Site 36WH297), Shawnee Minisink (Site 36MR43), and Thunderbird sites all had Paleoindian occupational surfaces but a dearth of datable features associated with those surfaces. At Shawnee Minisink (Site 36MR43), for example, three hearths were identified in addition to seven discrete chipping loci on the three occupational floors.

In the region as a whole, Gardner's (1979) site type structure should be tested for feasibility to the western Pennsylvania region. The PASS (Subbasin 20) data are not suitable for such a test because the database does not contain precise locational data. Although Custer's (1984) Paleoindian and Early Archaic settlement discussion, which builds on Gardner's site types, also may be applicable, Hay and Hamilton (1984) and Bergman et al. (1994a, 1994b) both argue that the continuity of site location reuse between Paleoindian and Early Archaic is not as strong as Custer (1984) posited. Further, Lantz' (1985) schemata for site types, very similar to Gardner's (1979) outline, does not seem as comprehensive as that of Gardner. Thus, Gardner's (1979) scheme is discussed below.

Gardner (1979) defined six Paleoindian site types: isolated point finds, quarry sites, quarry reduction sites, base camps, base camp maintenance stations (<15 km [9.3 mi] from base camps), and outlying hunting sites (15-40 km [9.3 – 28.4 mi] from base camps). The isolated point type could represent a remnant of one of any of the other site types. Quarry sites, though rarely identified, are located at rock outcrops and are marked by procurement debris (cores, rendered cores) and some initial stage reduction debris (primary and secondary decortication flakes). Gardner (1979) categorizes the quarry reduction site as located on level ground near potable water but close to the actual quarry. Additional reduction is completed at these locations and cores, decortication flakes, primary and secondary flakes, and Stage I, II, and perhaps III bifaces (following Callahan's 1979 reduction trajectory) mark the sites.

The base camp is a residential location. Gardner (1979) indicates that processing and storage features, in addition to shelters, should occur. The base camps will be located near water and ecotones, probably not too far from the quarries, and perhaps in settings with southern exposures. The lithic assemblages will include late stage biface reduction debris and an array of other tool forms implying domestic activities (scrapers, planers, etc.). It is not likely that early stage reduction debris or cores will be present in any numbers unless the base camp is positioned directly adjacent to the quarry.

The base camps are supported by maintenance stations and hunting camps. The former are within 15 km (9.3 mi) of the base camp while the latter are between 15 and 40 km (9.3 – 24.8 mi) of the base camp. The lithic assemblages from both sites are likely to be marked by a high tool to flake ratio, as the function of both sites is to process both floral and faunal resources. Gardner (1979) notes that blocky cores may be present to support the production of expedient tools. Certainly expedient tools were recovered in the Shawnee Minisink (Site 36MR43) assemblage (McNett 1985), though blocky cores were not present in the collection.

Subsistence and Seasonality Studies

Information on subsistence patterns is scarce. The most informative sources are those dealing with the Meadowcroft Rockshelter Stratum IIa (Adovasio et al. 1998 for summary and see earlier discussion herein) and the data from this stratum are presumably but not confirmably linked to the Paleoindian use of the shelter. As far as can be determined, no other Paleoindian component in the UOV has yielded subsistence remains.

In the greater region, subsistence and seasonality data have been recovered in small quantities from Site 36MR43 - Shawnee Minisink (Dent and Kauffman 1985; McNett 1985). The Shawnee Minisink (Site 36MR43) floral and faunal data suggest that a modern regime of plants and animals were present in the site area by late Paleoindian and Early Archaic times. Represented in the collection is evidence of several bean, fruit, and grass varieties. Included in the collection are blackberry (*Rubus* spp.), cherry (*Prunus* spp.), ground cherry (*Physalis* spp.), hackberry (*Celtis* spp.), poke berry (*Phytolacca americana*), and hawthorn plum (*Crataegus* spp.). The grass and green assemblage included pigweed (*Amaranth* spp.), loosefoot (*Chenopodium* spp.), wintercress (*Barbarea orthoceras*), wood sorrel (*Oxalis* spp.), and panic grass (*Panicum* spp.). In general, the assemblage, with its lack of tree nut species, suggests early to late spring occupations.

In the broader region, faunal evidence recovered from the Udora Site in extreme south-central Ontario indicates the use of both small and large mammal species. In the case of the Udora Site, the recovered bone included caribou (*Rangifer tarandus*), hare (*Lepus* spp.), and arctic fox (*Alopex lagopus*) (Storck and Spiess 1994:126-128). In the article's comparative discussion, Storck and Spiess (1994:136) state that organic residue identified as caribou blood was identified on a tool from the Shoop Site, on the Appalachian Plateau in eastern Pennsylvania.

Artifact Assemblages and Lithic Technologies

Lantz (1985:171) notes that western Pennsylvania Paleoindian sites have yielded the full spectrum of Paleoindian diagnostics, though the most common is the younger unfluted Plano points. Clovis, Folsom, Cumberland, Angostura, and area varieties such as Miller Lanceolate, McConnell Lanceolate, Stringtown Stemmed, and Sawmill Stemmed also have been recovered.

In general, Paleoindian points ranging from Clovis to Plano were typically manufactured on extralocal raw materials. Lantz (1985) identified raw materials and sources utilized by the Paleoindians as follows: Coshocton County, Ohio, Upper Mercer chert; Licking County, Ohio, Vanport chert (Ohio Flint Ridge); western New York, Onondaga, Lockport, and Pipe Creek cherts; Georgian Bay, Ontario, Amble chert; Adams and Franklin counties, Pennsylvania, yellow jasper; and smoky chalcedony possibly originating in Fulton County, Pennsylvania. The purposeful selection of high quality materials for use in the manufacture of the Paleoindian projectiles and knives is not unexpected. This pattern is common to oversized turkey tail points (Justice 1987) and also is seen in Hopewell and Adena cache blades (Justice 1987).

Lantz (1985) indicates that the late Paleoindian Plano projectile point tends to occur most commonly; however, the PASS (Subbasin 20) database lists 18 Clovis points and only three Plano points being recovered in the Pennsylvania study counties. The PASS database does not contain information on the raw materials used in the manufacture of these points. The study collections contained two Paleoindian points (Table 3.50). Both points were manufactured from chert; it is likely that both items might be Onondaga, as the 5Y4/1 color was consistently associated with that chert type on other Onondaga examples in the study collection.

Table 3.50. Study Collection Paleoindian Projectile Points and Raw Materials

Type	Site	Object Length (OL)	Blade Length	Blade Width	Thickness (Blade)	Chert Type / Color	Appendix D Figure #
Clovis	36AL19	110.11		32.38	7.85	Onandaga (5YR4/1 brownish gray)	D3
Plano Lanceolate?	36BV26	41.43	38.78	22.72	6.04	unidentified (5Y4/1 olive gray)	D66

As is well known, the Clovis point type is a fluted lanceolate. Justice (1987) characterizes the lanceolate as having parallel or slightly convex sides and a concave base. The base is commonly ground, as are the lateral edges. This is posited as a means of expediting hafting (Justice 1987). Probably one of the best descriptions of the fluted Paleoindian reduction trajectory is presented in Bonnichsen et al. (1985:Table 2, Figure 6). The steps are straightforward and the production trajectory is less convoluted than that identified by Callahan (1979) for later stemmed varieties.

Unfluted Clovis-like and lanceolate specimens may reflect the influence of the Plano tradition seen in the western United States and the upper Great Lakes region (Ritchie 1980). Evidence for the presence of the Plano tradition in the Northeast is generally scant, however.

Ritchie (1980) reports findings of projectile points, usually fragmentary, which exhibit the characteristic parallel flaking and other features described for Eden points.

The lithic assemblage recovered from Meadowcroft Rockshelter's (Site 36WH297) lower and middle Stratum IIa included "utilized flakes, diminutive blades, a variety of bifaces, a very limited number of unifaces (notably including the highly distinctive Mungai "Knife" form) and one example of the earliest dated projectile point type from the Cross Creek drainage, the Miller Lanceolate..." (Adovasio 1983:8). There is evidence, in the form of cross-mended fragments of a possible bifacial thinning flake, that a Clovis/eastern fluted point may have been manufactured during the use of what is now designated upper middle Stratum IIa. As Adovasio notes (1983:8), this possible evidence for the production of a fluted point occurs stratigraphically above the level that yielded the unfluted Miller Lanceolate point.

Adovasio (1983:8-9) notes that the Miller Lanceolate point is morphologically similar to points recovered from Paleoindian basal strata at Fort Rock Cave (Oregon), Ventana Cave (Arizona), and Levi and Bonfire rockshelters (Texas). He also considers the type at least superficially similar to the unfluted Great Plains Plainview and Milnesand types (Adovasio 1983:9), however, based on the absolute dates, the Miller Lanceolate pre-dates these and unfluted Paleoindian points in general in the eastern United States.

The Miller complex is marked by debitage resulting from a full spectrum of lithic manufacture and maintenance actions. Raw material sources include Ohio Flint Ridge, Kanawha chert, and central and eastern Pennsylvania jasper, in addition to local Monogahela sources in the Cross Creek vicinity. Adovasio (1983) reports that the Miller complex artifact assemblage also contains prismatic blades struck from cylindrical polyhedral cores; others who have examined the blades are not in agreement that they represent items removed from prismatic cores (Bergman 2002). While the cores were not present in the Meadowcroft Rockshelter Miller complex assemblage, they were recovered from the nearby Krajacic Site. The latter site also yielded prismatic blades (Adovasio 1983); in the absence of temporally diagnostic artifacts, however, these items cannot be confirmed as Paleoindian.

Research Issues – Paleoindian

Interpretation of the Paleoindian period in the study area suffers from a lack of pure components or sites. Although the investigations at Meadowcroft Rockshelter (36WH297) recovered a suite of important information from both pre-Archaic and Archaic levels, the site was, for much of its use history, a small camp or bivouac. Thus, the results obtained at Meadowcroft Rockshelter are representative of but one aspect of what is apparently a much larger settlement network. Once the PASS data are fully edited for the region, the following research questions should be addressed:

- What are the setting data for sites yielding only Paleoindian diagnostics? Is there evidence to support a conclusion that one or more of these sites are single component occupations?

- What are the site sizes for both Paleoindian sites and Paleoindian components? Are these Paleoindian manifestations distributed by size category in any meaningful way across the landscape?

- Is there any patterning when the relationship of Paleoindian projectile point types are related to topographic setting, distance to water, or other environmental variables? Does it appear that there might have been selection of specific settings during various phases of the Paleoindian?

- In the region as a whole, is Gardner's (1979) site type structure applicable?

Early Archaic (8000 B.C. – 6000 B.C.)

The transition from Paleoindian to Archaic appears to have been seamless. The differences between the two periods probably represent mere adjustments to the tool kit to accommodate an increasingly more varied array of floral and faunal resources. In the study region, the incidence of Early Archaic components is virtually the same (n=79) as the preceding Paleoindian (n=73). Of this total, 36 PASS sites with Early Archaic components occur within 100 m of a permanent river (Table 3.51).

However, two sites in the PaBHP (Subbasin 20) database are classified as Terminal Paleoindian/Early Archaic, and an additional 112 are assigned to the transition from Early Archaic to Middle Archaic based on the presence of bifurcate projectile points. Thus, the overall evidence for Early Archaic sites/components in the study area is more pronounced than for the earlier Paleoindian but still low relative to subsequent periods. The reasons for this are undoubtedly mixed but probably include degradation of sites through time and alluvial or colluvial masking. Based on the results of work to date at Site 36AL480, much of that site's use occurred during the Archaic stage; however, the use seems to have occurred beginning in the late Early Archaic based on the presence of the LeCroy Bifurcate Stem in the Phase I/II collection.

In the study area, no site report was found that documented Early Archaic features except publications detailing Meadowcroft Rockshelter (36WH297) and the Goddard Site (Site 36ME105; Koetje 1998). In the greater study region, Early Archaic features were documented at the St. Albans Site (Broyles 1971), but no work areas or features were associated with the Early Archaic (LeCroy) occupation level at Sandts Eddy (Site 36NM12; Bergman et al. 1994b:417).

Table 3.51 PASS (Subbasin 20) Early Archaic Components Within 100 M of Permanent River								
Site	**Site Type**	**Subbasin 20 Watershed**	**Major Stream**	**Distance (m) to Major Stream**	**Minor Stream**	**Distance (m) to Minor Stream**	**Topographic Setting**	**Period**
36AL255	Open habitation	G	Ohio River	80	Sewickley Creek	160	Ridgetop	Early Archaic
36AL272	Open habitation	G	Ohio River	50	Sewickley Creek	160	Terrace	Early Archaic
36AL480	Open habitation (not listed in PASS as of 2001)	G	Ohio River	0	Ohio River	0	Floodplain and terraces	Early, Middle Archaic (based on collection examination; radiocarbon dates; results of current work)
36BT160	Open unknown function	C	Slippery Rock Creek	80	Connoquenessing Creek	100	Terrace	Early Archaic
36BT204	Open habitation	C	Slippery Rock Creek	100	Connoquenessing Creek	180	Hilltop	Early Archaic
36BT227	Open habitation	A	Allegheny River	20	Other	580	Middle Slopes	Early Archaic
36BV4	Village	B	Ohio River	0	Beaver River	50	Terrace	Early Archaic (based on collection examination)
36BV11	Open surface scatter <20m radius	D	Ohio River	40	Raccoon Creek	40	Hilltop	Early Archaic (based on collection examination)
36BV14	Open habitation	D	Ohio River	60	Raccoon Creek	180	Floodplain	Early Archaic (based on collection examination)
36BV22	Open habitation	D	Ohio River	0	Raccoon Creek	290	Terrace	Early Archaic to Early, Middle Archaic (based on collection examination)
36BV26	Open habitation	D	Ohio River	60	Raccoon Creek	120	Floodplain	Early Archaic to Early, Middle Archaic (based on collection examination)
36BV38	Open habitation	D	Ohio River	0	Raccoon Creek	220	Stream Bench	Early Archaic (based on collection examination)
36BV50	Open habitation	D	Ohio River	40	Raccoon Creek	80	Floodplain	Early Archaic
36BV60	Open habitation	D	Ohio River	90	Raccoon Creek	100	Island	Early Archaic
36BV68	Open unknown function >20m radius	B	Ohio River	60	Beaver River	100	Terrace	Early Archaic
36BV72	Open surface scatter <20m radius	C	Slippery Rock Creek	60	Connoquenessing Creek	70	Floodplain	Early Archaic
36BV150	Open habitation	C	Slippery Rock Creek	60	Brush Creek	150	Floodplain	Early Archaic
36BV194	Rock Shelter/ Cave	B	Ohio River	0	Beaver River	240	Stream Bench	Early Archaic

Table 3.51 PASS (Subbasin 20) Early Archaic Components Within 100 M of Permanent River (cont.)

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36BV241	PASS coded as Historic	D	Ohio River	10	Raccoon Creek	240	Floodplain	Early Archaic
36BV255	Open surface scatter <20m radius	B	Ohio River	80	Beaver River	170	Floodplain	Early Archaic
36CW59	Open habitation	A	Shenango River	100	Neshannock River	220	Stream Bench	Early Archaic
36CW101	Open habitation	A	Shenango River	0	Not completed	160	Stream Bench	Early Archaic
36LR164	Rock Shelter/ Cave	A	Shenango River	20	Neshannock River	280	Stream Bench	Early Archaic
36ME90	Open surface scatter <20m radius	A	Shenango River	60	Neshannock River	110	Terrace	Early Archaic
36ME207	Open habitation	C	Slippery Rock Creek	0	Brush Creek	210	Saddle	Early Archaic
36WH235	Open unknown function	F	Ohio River	0	Chartiers Creek	140	Hill Ridge/ Toe	Early Archaic
36WH401	Open unknown function	D	Ohio River	0	Raccoon Creek	260	Saddle	Early Archaic
36WH501	Isolated Find	D	Ohio River	80	Raccoon Creek	220	Middle Slopes	Early Archaic
36WH1020	Open unknown function	F	Ohio River	80	Chartiers Creek	200	Saddle	Early Archaic
36WH1065	Open unknown function	F	Ohio River	60	Chartiers Creek	240	Terrace	Early Archaic
36WH1091	Open unknown function	E	Ohio River	40	Buffalo Creek	60	Stream Bench	Early Archaic
36WH1110	Open unknown function >20m radius	E	Ohio River	10	Buffalo Creek	120	Floodplain	Early Archaic
36WH1118	Lithic Reduction	F	Ohio River	100	Chartiers Creek	160	Terrace	Early Archaic
36WH1154	Open unknown function >20m radius	F	Ohio River	100	Other	160	Middle Slopes	Early Archaic
36WH1156	Open unknown function >20m radius	F	Ohio River	80	Other	170	Terrace	Early Archaic
36WH1191	Open unknown function	E	Ohio River	10	Other	180	Terrace	Early Archaic

Cultural Chronology

George (1985) assigned the Early Archaic to the period from about 8000 B.C. to 6000 B.C. Adovasio et al. (1998:5) start their Archaic sequence about 500 years earlier, and assign the Early Archaic to the period from about 8500 B.C. to 6000 B.C. (10,450 – 7950 B.P). the date range offered by George (1985), the more conservative of the two, is accepted here because of a general paucity of dates for both of the bracketing periods (Paleoindian and Middle Archaic). The diagnostic elements of the Early Archaic in the region are restricted to specific projectile point types. The projectile points assigned to the Early Archaic in the PASS (Subbasin 20) database are discussed below in the Artifact Assemblage section.

Site Settlement Patterns

With a restricted number of sites to reference, Mayer-Oakes (1955) concluded that Archaic sites tended to occur most often on "benches or terraces along both major and minor streams" (Mayer-Oakes 1955:78). Years of persistence on the part of investigators in the eastern United States has resulted in a more refined picture of at least the general Archaic settlement pattern, though sparse Early and Middle Archaic data still makes the applicability of the model to those periods in question. While some posit that the lack of Early and Middle Archaic sites simply is a function of site burial, in the study region site burial and erosion, site degradation resulting from development and agriculture, and even amateur collection of hallmark projectile points, have taken their toll on the data set.

The general Archaic settlement pattern across the Plateau appears to have consisted of macro- and microband base camps, hunting/gathering stations of various complexity, and certain specialized site types such as cemeteries and quarries (Adovasio et al. 1998; Cowin 1991; Custer et al. 1994; Funk 1991; Ritchie and Funk 1971, 1973). The base camps occurred along major and minor tributary drainages; hunting and gathering stations were more widely distributed and were not as closely tied to permanent water sources. The siting criteria for cemeteries are unclear, but factors, not surprisingly, may relate to well-drained or dry settings. Quarries and resource specific exploitation loci (for example, fish weirs) were not intentionally sited, but occurred fortuitously at the locations containing the resources.

Beginning in the Early Archaic and continuing through the Middle Archaic to the Late Archaic, the size of the macro- and microband sites appears to have been approximately the same. By the Late Archaic (post-3000 B.C.), however, site data recovered from the central and eastern Pennsylvania and Southern Tier New York river valleys indicate that expansive macroband base camps begin to appear on river terraces. These sites are significantly larger than the micro- and macroband sites of the earlier periods.

The PASS (Subbasin 20) and OHPO (Leetsdale) data seem to generally support a similar conclusion for events within the study area although the lack of a large corpus of excavated data prohibits complete substantiation and site-size data are incomplete. Of the 198 Paleoindian/Early Archaic, Early Archaic, and Early/Middle Archaic components identified in the two databases, 191 of them have site setting data coded for them. During

these combined periods, 59.6 percent of the components are located in lowland settings; the majority of these are either on floodplains or terraces. The remaining components are located in a relatively broad array of upland settings. Many of these upland locations are in close proximity to headwater streams or springs. By the Late Archaic, the percentage (64.5%) of the sites/components located in lowland settings (n=229) has increased and more sites are occurring on terraces than in earlier periods.

The PASS (Subbasin 20) data relative to site setting preferences can be examined on a finer basis (Table 3.52). Based on the setting data for sites with named projectile points, it seems that the producers of Kirk series points were taking advantage of both lowland and upland settings.

The reasons for the occupational concentration in the lowlands are not clear. It is presumed that these settings were selected because they contained sufficient high-yield resources to support groups of people for extended periods of time. The best continuous column of subsistence information for the Archaic stage in the study region is that recovered during the Meadowcroft Rockshelter investigations (Adovasio et al. 1998). Although it may be problematic to extrapolate data recovered from a rockshelter to open habitation sites, presumably there is some overlap as regards resource exploitation. The Meadowcroft subsistence and feature data suggest that the various episodes of shelter use represent the remnants of base camps, though probably not macroband camps. It is possible that some of the occupations were short term, but the investigators do not seem to believe that any occupation, with the possible exception of the Paleoindian, represents procurement (hunting/gathering) stations (Adovasio et al. 1998; Carlisle and Adovasio 1982).

Microband base camps may be found in smaller valleys, and possibly around upland water sources. Certainly, in the northern part of the study area in particular, smaller sites representing either microband or procurement stations occur adjacent to marshes or large swamps, along headwater streamheads, and near springs (Fryman 1979; Herbstritt 1980, 1981b; Knepper and Petraglia 1996; Koetje 1998; Stewart and Kratzer 1989; Witthoft 1971). The data recovery of a site like Site 36ME105 (the Goddard Site) does much to give specificity, for example, to microband residential loci (Koetje 1998). It appears, based on the data from that site, those habitation structures, in addition to processing features, should be expected at the smaller upland sites. How to distinguish this site class, however, from procurement camps on the Phase I level will take significantly more work at both site types.

Subsistence and Seasonality Studies

The Archaic pattern of seasonal resource scheduling begins in the Early Archaic, though as noted by Caldwell (1958), it reaches its peak efficiency during the Late Archaic (Caldwell 1958). Task groups dispersed from optimally located semi-permanent or permanent base camps implemented procurement strategies. Base camps remain situated along the terraces of the major stream valleys. Smaller hunting and extractive camps, focused on exploitation of more diffuse or seasonally restricted resources, are generally located in the hinterlands on small streams, adjacent to marshes or large swamps, and near large springs situated well back in the hills (Ritchie and Funk 1973; Ritchie 1980).

Table 3.52. PASS (Subbasin 20) Early Archaic Landform, Topographic Setting and Associated Projectile Points				
Landform	**Topographic Setting**	**Associated Projectile Points**	**N=**	**% of Base N=**
Lowland	Floodplain	Kirk	9	
		Kirk Corner Notched, Otter Creek	1	
		LeCroy Bifurcated Stem, Kirk Corner Notched, Otter Creek / Big Sandy	1	
		LeCroy Bifurcated Stem, LeCroy Side-Notched, Otter Creek / Big Sandy	1	
		Otter Creek	1	
	Floodplain and terraces	LeCroy Bifurcated Stem	1	
	Island	Kirk	1	
	Rise in Floodplain	Kirk	1	
		Otter Creek	1	
	Terrace	Kirk	10	
		Kirk Corner Notched, Kirk Stemmed	1	
		Kirk Corner Notched, Otter Creek	1	
		Kirk; Palmer	1	
		LeCroy Bifurcated Stem, Kessell Side Notched, Otter Creek / Big Sandy	1	
		Palmer	1	
		St. Albans Side Notched	1	
Lowland N=			**33**	**47.8**
Upland	Hill Ridge/ Toe	Kirk	4	
	Hillslope	Kirk	2	
	Hilltop	Kanawha Stemmed	1	
		Kirk	4	
		Kirk; Palmer	1	
	Middle Slopes	Kirk	3	
		Palmer	1	
	Ridgetop	Kirk	4	
	Saddle	Kirk	5	
	Stream Bench	Kirk	8	
		Kirk Corner Notched, Otter Creek / Big Sandy	1	
		Kirk, Palmer	1	
	Upland Flat	Kirk	1	
Upland N			**36**	**52.2**
Base N=			**69**	**100.0**

While procurement and processing strategies change and are modified through the Archaic stage, the few Early Archaic features that have been isolated do not seem to be appreciably different from those identified in subsequent Middle, Late, or Terminal Archaic context. At Site 36ME105 (the Goddard Site), the Early Archaic features are described as large postmolds, small postmolds, rock-lined hearths, and burned earth and ash zones (Koetje 1998:29, 35-39). The six large postmolds measured 15-20 cm in diameter and were 2-5 cm deep. Koetje (1998:35) associates the large postmold with a burned earth, shallow basin hearth (Feature 1). A second hearth, Feature 15, was described as "small, shallow, and oval in plan. It contained heat-reddened sediment, with the bottom defined by horizontally-oriented, flat rocks" (Koetje 1998:35). Virtually no organic materials were recovered from any of the features.

Subsistence and seasonality studies for the Archaic in general outside of the site-specific works and occasional summary articles do not seem to exist for the study region. The three most notable site-specific studies in the region are Meadowcroft Rockshelter (Carlisle and Adovasio 1982), Scenery Hill 1 (Site 36AL375; East et al. 1996), and Site 36ME105 (the Goddard Site; Koetje 1998). Of these, the Meadowcroft Rockshelter (Site 36WH297) investigations yielded the most comprehensive Early Archaic subsistence data. The Scenery Hill 1 (Site 36AL375) Phase I/III investigations recovered only Late Archaic data. Finally, the Site 36ME105 investigations yielded virtually no organic residue. Koetje (1998), based on chipped stone data from the Early Archaic occupation area, hypothesizes that the component occupation was brief and limited in scope.

Thus, turning to the Meadowcroft and regional data (Meltzer and Smith 1986; Neusius 1986), a picture of Early Archaic subsistence can be constructed. First, the Early Archaic component at Meadowcroft Rockshelter yielded floral and faunal materials suggestive of a continuation of Paleoindian regimes. However, the Early Archaic projectile points in the collection are hypothesized to be “more suitable to the ambush hunting of white-tailed deer” than earlier forms (Adovasio et al. 1998:22). Early Archaic sites in the Mississippi River Valley and the lower Ohio River Valley have yielded box turtle (*Terrapene* var. spp.), small rodents (mole [*Scalopus* spp.] and vole [*Microtus* spp.]), in addition to beaver (*Castor canadensis*), cottontail (*Silvilagus* spp.), muskrat (*Ondatra zibethecus*), raccoon (*Procyon lotor*), and squirrel (*Sciurus* spp.) (Meltzer and Smith 1986:17). Bone representing deer (*Odocoileus virginianus*) and elk (*Cervus canadensis*) also were recovered.

Floral assemblages at both Meadowcroft Rockshelter (Site 36WH297) and the Meltzer and Smith (1986) Mississippi River Valley and lower Ohio River valley sites included oak acorn (*Quercus* spp.), hickory nut (*Carya* spp.), black walnut (*Juglans* spp.), hackberry seeds (*Celtis occidentalis*), and persimmon seeds (*Diospyros virginianus*) in Early Archaic contexts (Meltzer and Smith 1986:17). These species were recovered from Meadowcroft Archaic levels as well (Carlisle and Adovasio 1982).

Artifact Assemblages and Lithic Technologies

Mayer-Oakes (1955:74) noted that "knowledge of this [Archaic] period is at such a rudimentary stage in this area [UOV] that it will be presented here as a complex of artifacts". He included in the complex "plain, beveled, or grooved adzes...bannerstones, stemmed and notched points, scrapers of various forms, full-grooved axes and fragments of steatite vessels" (Mayer-Oakes 1955:74). Our understanding of the Archaic has grown since the Mayer-Oakes era; increasingly sophisticated dating techniques like radiocarbon are now leading to reconsideration of the temporal placement of many of the stage’s presumed hallmarks (Raber et al. 1998). However, there still is an overall lack of excavated sites from which to draw conclusions concerning the full scope of the artifact assemblage for the period.

Chipped Stone

The changes in the Early Archaic hafted biface form from those of the Paleoindian are postulated to be in response to the supposed wider range of exploitable resources. Lanceolate projectiles are replaced by smaller notched and stemmed points, theoretically used in the pursuit of smaller game such as deer and elk. However, as the Udora Site (Storck and Spiess 1994) data indicate, large lanceolate points are co-occurring with small animals like arctic fox and hare.

Whatever the case, under traditional schemes, diagnostic Early Archaic projectile point types include Big Sandy Side Notched, Kessell Side Notched, Kirk Corner Notched, Kirk Serrated (late), Kirk Side Notched, Kirk Stemmed, LeCroy, MacCorkle Stemmed, Palmer Corner Notched, and St. Albans Side Notched. The Big Sandy forms continue into the Middle Archaic and Cowin (1991:46) assigns both it and Otter Creek to that era. Cowin (1991:46) does not present support for the assignment. However, Justice (1987:60-62) correlates Otter Creek with both Big Sandy and Raddatz Side Notched as members of his Large Side Notched Cluster and places Otter Creek in both Early and Middle Archaic contexts based on radiocarbon dates and co-occurrence with other Early Archaic diagnostic forms.

In the study area, all of these types are noted as indicative of the Early Archaic and all but the Palmer were noted in the study collections reviewed for this project. The study collections also contained examples of the following Early Archaic types: Calf Creek, Kanawha Stemmed, Kessell Side Notched, Kirk Corner Notched and Stemmed, MacCorkle Stemmed, Otter Creek, Otter Creek/Big Sandy, St. Albans Side Notched, St. Charles, and Thebes (Table 3.53). In addition, the LeCroy series projectile points begin to appear in the late Early Archaic and continue to be manufactured into the Middle Archaic period. The various projectile points are briefly reviewed below beginning with the bifurcates.

Table 3.53. Study Collection Early Archaic Projectile Point Types

Period	Type – Final	Total
Early Archaic	Calf Creek	3
	Kanawha Stemmed	2
	Kessell Side Notched	1
	Kirk Corner Notched	6
	Kirk Stemmed	2
	MacCorkle Stemmed	1
	Otter Creek	7
	Otter Creek/Big Sandy	11
	St. Albans Side Notched	2
	St. Charles	1
	Thebes	4
Early Archaic N=		**40**
Early Archaic, Middle Archaic	LeCroy Bifurcated Stem	8
	LeCroy Side-Notched?	1
Early Archiac, Middle Archaic N=		**9**

Bifurcate projectile points, like the Kirk Stemmed and the LeCroy Bifurcated Stem, initially were defined in the Southeast (Broyles 1971; Kneberg 1956) and were assigned to the Middle Archaic. Bifurcated-base points have been dated to about 6200-6800 B.C. at the St. Albans Site (no site number known; Broyles 1971) and 7400 B.C. at Sandts Eddy (Site 36NM12; Bergman et al. 1994a, 1994b. Dates such as those obtained by Bergman et al. (1994a, 1994b) at Sandts Eddy (Site 36Nm12), however, suggest that bifurcates like Lake Erie Bifurcate and Kanawha Stemmed, not to mention the somewhat more ubiquitous Kirk series and LeCroy Bifurcated Stem, developed in the late Early Archaic and continued to be manufactured into the Middle Archaic (Broyles 1971; Justice 1987).

The most common varieties in the study area seem to be representatives of the Kirk and LeCroy series. In the study area sample sites, a LeCroy point was recovered from Site 36BV292 (the Connoquenessing Site) during the Phase III data recovery (Knepper et al. 1993:82) at this relatively shallow upland terrace site. The point was manufactured on unidentified gray and brown mottled chert. Two examples were recovered from the Saddle Site (46MR95) located in on an upland ridge toe. Both of these points were manufactured of Hughes River chert. The Site 36AL480 collection contains an example manufactured on Kanawha chert (Table 3.54). This example was recovered from terrace deposits and in association with a fragment Stage 3 biface. On Table 3.54, the italicized and bolded cells for the LeCroy Bifurcated Stem from Site 36BV26 indicate that the object was fragmented and so was its stem. It is included herein because it is part of the study sample.

Table 3.54 Study Collection LeCroy Projectile Point Summary Data

Type	Site	Object Length (OL)	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Material	Appendix D Figure #
Bifurcated Stem	36AL19	31.26	19.41	31.19	18.15	4.62	Chert, Cochocton	D4
Bifurcated Stem	36AL19	33.02	25.32	26.70	14.88	6.49	Chert, Cochocton	D4
Bifurcated Stem	36AL19	35.21	27.07	22.61	12.44	4.56	Jasper	D4
Bifurcated Stem	36AL19	50.75	40.85	33.07	16.85	4.94	Chert, Onondaga	D4
Bifurcated Stem	36AL480	37.10					Chert, Kanawha	D26
Bifurcated Stem	36BV22	29.99	21.24	18.13	14.77	4.45	Chert, Kanawha	D56
Bifurcated Stem	36BV24	18.62	9.82	25.62	14.32	5.03	Chert, unidentified	D60
Side-Notched?	36BV24	30.86	23.90	20.29	10.01	4.35	Chert, unidentified	D60
Bifurcated Stem	36BV26	***33.29***	29.07	22.61	***16.42***	5.69	Chert, unidentified	D66

Of the nine LeCroy examples in the study collections (Table 3.54), all but one is manufactured of chert. Although Onondaga chert is present, it is the occurrence of both the Cochocton and Kanawha cherts that suggests importation of extralocal materials or finished

tools into the study area though, admittedly, the Kanawha chert is relatively accessible in nearby West Virginia. Two of the points (36AL19, item length 31.26 mm; 36BV24, item length 18.62 mm) exhibited evidence of resharpening and the example from 36AL480 displays lateral damage.

The LeCroy type typically exhibits a deep basal notch and the basal ears are pointed (Justice 1987:91). The LeCroy type is stylistically related to the Lake Erie Bifurcated and the latter is probably a variant (Justice 1987). The LeCroy occurs widely although sparsely as surface finds throughout the southern parts of the Northeast. The form is lightly distributed as well along the Hudson Valley and across the Southern Tier of New York. In general, it may be more common in the southern reaches of the Kanawha Section of the Plateau than in the northern areas.

The Kirk Stemmed type is a broad stemmed form with a long blade that may exhibit deep serration while the Kirk Corner Notched type exhibits a "large triangular blade with a straight or slightly rounded base and bifacially serrated edges" (Justice 1987:71). The study collection sample (Tables 3.55, 3.56) are all manufactured of chert. One of the Kirk Corner Notched from Site 36BV10 (length 25.76) has been resharpened and its tip is truncated. Both of the items from Sites 36BV13 and 36BV26 (bolded and italicized below on Table 3.56) are fragments with both displaying damage to their lengths and widths. They are included herein for the data their other attributes provide.

Table 3.55. Study Collection Kirk Stemmed Projectile Point Summary Data

Site	Object Length (OL)	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Material	Appendix D Figure #
36AL19	67.01	56.70	33.40	16.53	7.77	Chert, Kanawha	D4
36BV10	53.23	43.34	29.57	13.69	8.32	Chert, unidentified	D36

Table 3.56. Study Collection Kirk Corner Notched Projectile Point Summary Data

Site	Object Length (OL)	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Material	Appendix D Figure #
36BV10	***25.76***	15.45	25.32	22.16	5.77	Chert, unidentified	D36
36BV10	44.35	33.24	24.58	20.49	5.94	Chert, unidentified	D36
36BV13	***30.54***	***25.98***	26.79	19.44	8.22	Chert, Onondaga	D42
36BV26	***34.70***	***26.98***	20.23	14.70	6.43	Chert, unidentified	D66
36BV3	51.25	41.55	34.06	27.81	8.18	Chert, unidentified	D27
36BV38	37.27	26.80	26.26	21.49	5.90	Chert, Onondaga	D69

Calf Creek points were originally defined from examples recovered from Calf Creek Cave in Arkansas (Perino 1968:14). The type was recovered below strata containing Big Sandy and Rice points. Although Dickson (1968) and Perino (1968) both thought the type was probably assignable to the Middle Archaic, it is now assigned to both the Early Archaic and the very early Middle Archaic (Justice 1987). A broad, short, and deeply notched blade characterizes the type. The stem is pronounced and marked by the presence of smoothing or grinding in addition to perpendicular flake removals. The three examples in the study collection all were from Site 36AL19 (Table 3.57). The item on Table 3.57 that measures 50.48 mm long suffered lateral margin damage to its blade and stem.

Table 3.57. Study Collection Calf Creek Projectile Point Summary Data							
Site	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Material**	**Appendix D Figure #**
36AL19	48.02	42.29	48.23	29.94	8.80	Chert, Kanawha	D3
36AL19	50.48	42.14	***33.73***	***29.09***	7.56	Chert, unidentified	D3
36AL19	75.28	71.52	44.77	26.71	8.49	Chert, unidentified	D3

Kanawha Stemmed projectile points (Table 3.58) are described by Justice (1987:95-96) as displaying small, triangular blades with shallow, bifurcated bases. The two examples in the study collection are both fragmentary. According to Justice (1987:246) the expected length range is 19-48 mm and the width range is 19-37 mm.

Table 3.58. Study Collection Kanawha Stemmed, Kessell Side Notched, and MacCorkle Stemmed Projectile Point Summary Data								
Type	**Site**	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Material**	**Appendix D Figure #**
Kanawha Stemmed	36AL19	***32.68***	***20.46***	28.18	20.90	5.28	Chert, unidentified	D4
Kanawha Stemmed	36BV11	***41.52***	***33.81***	22.18	11.92	5.78	Chert, unidentified	D39
Kessell Side Notched	36BV22	***33.53***	***31.84***	***26.22***	25.66	5.67	Chert, unidentified	D56
MacCorkle Stemmed	36AL19	***41.62***	***31.66***	39.40	25.96	7.89	Chert, unidentified	D4

Kessell Side Notched (Table 3.58) projectile points were originally described by Broyles (1966:18) from items recovered in the Early Archaic levels at St. Albans. The type is grouped by Justice (1987:61, 67) as a member of the Large Side Notched Cluster which also includes Big Sandy, Graham Cave Side Notched, Godar, Raddatz Side Notched, and Osceola/Hemphill forms. Kessell Side Notched points are common in the Ohio River Valley with their range extending through the lower and middle portion of the valley. The single example identified in the study collection is fragmentary. Justice (1987:244) lists the length range, based on the nine St. Albans examples, as 36-48 mm; width range is 23-29 mm.

The MacCorkle Stemmed point in the study collection (Table 3.58) is typologically classified as a member of the Rice Lobed Cluster (Justice 1987:86). The type is common throughout the Midwest and Upper South and its range extends across the Southern Tier of New York and across the Hudson River into Connecticut. The example in the study collection was fragmentary. Justice (1987:246) states the length range is 40-63 mm and width is 22-35 mm.

Otter Creek / Big Sandy projectile points as defined (Bell 1960:8; Kneberg 1956:25) were assigned to the Eva phase (ca. 5000 B.C.) of the Middle Archaic period. The original distribution of the type was postulated to be western and central Tennessee, Kentucky, and northern Alabama. Bell (1960:8) noted, however, that it had obvious correlates with the Illinois Black Sand point and the Wisconsin Osceola point (Bell 1958:68). Kneberg (1956) described the point as possessing a triangular blade with excurvate side edges. The basal edge is standardly incurvate or straight and the side notches are narrow and short. The notches lie perpendicular to the long axis of the blade. Subsequent work in the Midwest and Southeast indicates that the type Otter Creek / Big Sandy dates to the Early Archaic and the early Middle Archaic (Justice 1987:60-62).

The study collection sample of Otter Creek and Otter Creek / Big Sandy examples is one of the larger groupings in the sample (Table 3.59). Typical identified raw materials include both Onondaga and Kanawha cherts. While the presence of the latter could suggest either imported raw material or dressed pieces, the proximity of Beaver County to sources in West Virginia suggests that access to the material may have been unrestricted. Several pieces, marked by bolded italics in Table 3.59, are fragmentary.

Table 3.59. Study Collection Otter Creek and Otter Creek / Big Sandy Projectile Point Summary Data

Type	Site	Object Length	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Chert Type	Appendix D Figure #
Otter Creek	36BV3	36.05	22.20	28.82	29.14	7.09	Onondaga	D27
Otter Creek	36BV3	38.80	29.93	23.87	23.05	7.20	Onondaga	D27
Otter Creek	36BV3	49.35	37.36	21.24	21.18	7.77	Onondaga	D27
Otter Creek	36BV3	49.64	38.47	27.00	22.94	8.10	unidentified	D27
Otter Creek	36BV13	42.63	30.50	25.48	21.82	7.11	unidentified	D42
Otter Creek	36BV21	30.28	19.22	19.04	21.88	7.15	unidentified	D48
Otter Creek	36BV21	39.48	30.23	22.05	*20.10*	7.04	unidentified	D48
Otter Creek/ Big Sandy	36BV22	***29.62***	***19.33***	21.01	21.66	7.76	Onondaga	D54
Otter Creek/ Big Sandy	36BV22	***31.36***	***21.59***	24.72	22.62	6.51	unidentified	D54
Otter Creek/ Big Sandy	36BV22	35.52	24.08	27.97	***26.60***	12.49	Onondaga	D54
Otter Creek/ Big Sandy	36BV22	***38.81***	***28.78***	22.69	20.12	7.53	Onondaga	D54
Otter Creek/ Big Sandy	36BV22	38.86	27.57	20.73	***13.25***	6.45	Onondaga	D58
Otter Creek/ Big Sandy	36BV22	39.42	28.99	18.14	22.06	8.80	unidentified	D54
Otter Creek/ Big Sandy	36BV22	46.03	36.64	23.49	22.79	8.95	Onondaga	D54
Otter Creek/ Big Sandy	36BV24	38.83	28.57	21.39	18.49	6.77	unidentified	D60
Otter Creek/ Big Sandy	36BV24	49.62	36.36	21.66	18.91	10.41	unidentified	D60
Otter Creek/ Big Sandy	36BV26	37.92	27.67	20.52	20.41	6.88	Kanawha	D66
Otter Creek/ Big Sandy	36BV38	27.76	18.77	24.25	24.22	7.65	unidentified	D69

St. Albans Side Notched projectile points (Table 3.60) were originally described by Broyles (1966:23-25) based on the 37 examples recovered during her St. Albans excavations. Broyles (1966; also Justice 1987:90) subdivided the type into two varieties: A and B. The only difference between the two varieties is an absence of basal grinding and a narrowing of the blade on Variety B. The study collection item from 36AL19 is a Variety A type. The example from Site 36BV4 is not classified as to variety; it is resharpened. The artifact thickness suggests it might be a Variety B, as the thickness range for that variety is 5-9 mm while the Variety A thickness range is 5-7 mm (Justice 1987:246).

Table 3.60. Study Collection St. Albans Side Notched and St. Charles Projectile Point Summary Data

Type	Site	Object Length	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Chert Type	Appendix D Figure #
St. Albans Side Notched	36AL19	35.29	26.12	22.31	18.40	4.46	unidentified	D4
St. Albans Side Notched	36BV4	35.07	26.61	16.88	14.02	7.44	unidentified	D33
St. Charles	36AL19	76.38	62.95	36.29	***25.32***	7.31	unidentified	D3

The single St. Charles point (Table 3.60) in the study collection was recovered in conjunction with other Early Archaic points. Its stem is fragmented. St. Charles points are found across the Midwest and upper South and are noted in collections as far east as the Delaware River Valley (Justice 1987:57-58). The type is lanceolate; the blade is ovate, excurvate with a convex base.

Thebes projectile points are part of the Thebes Cluster which also includes St. Charles points. Like the St. Charles, the Thebes points are deeply tanged and are characterized by Justice (1987:54) as "medium to large-sized dart points…with pronounced side or diagonal notches." All of the study collection examples were recovered from Site 36AL19 and all of them had been resharpened (Table 3.61). The item with the italicized and bolded blade width measurement suffered significant lateral damage.

Table 3.61. Study Collection Thebes Projectile Point Summary Data

Site	Object Length	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Chert Type	Appendix D Figure #
36AL19	70.50	56.95	48.89	48.03	8.97	unidentified	D3
36AL19	72.47	60.12	***41.89***	33.02	7.56	unidentified	D3
36AL19	74.38	47.35	43.67	50.77	9.30	Kanawha	D3
36AL19	91.50	67.43	35.24	40.78	10.21	unidentified	D3

Research Issues – Early Archaic

At present, the Early Archaic data set is founded largely on surface data. Few of the Early Archaic sites have been subjected to excavation beyond rudimentary Phase I levels. Nonetheless, testing of site settlement models is possible using the PASS database and, to a lesser extent, the OHPO database as well. Such a modeling endeavor for this period and subsequent ones is not just an academic exercise. The results will do much to address issues related to preferred settings, adaptive responses, and potential eligibility.

For issues related to settlement and subsistence strategies, the paramount research questions for the Early Archaic are as follows.

- What are the site distribution patterns for the terminal Paleoindian/Early Archaic, Early Archaic, and late Early Archaic / Middle Archaic?

- Are there differences in site selection that would suggest differential use of space through this period?

- Is there patterning to the distribution of site types by landform (upland vs. lowland) or by specific topographic setting (floodplain, terrace, ridge, etc.)?

Chronology and artifact assemblage questions are linked for the Early Archaic because the initial appearance of certain projectile point types remains unresolved. Thus, attention should be paid to the acquisition of absolute dates from contexts with solid projectile point associations. Potential research questions relating to the period's artifact assemblage are listed below.

- What artifact types are typically found in association with each of the projectile point types?

- Are any of these other artifact types commonly manufactured of exotic raw materials?

- Does the use of Cochocton, Kanawha, and Onondaga cherts indicate extralocal contacts, importation into the study region of raw materials or finished products, or some combination of both?

Middle Archaic (6000 B.C. – 3000 B.C.)

There is a gradual increase in identified components from the transitional Early/Middle Archaic (n=112) through the Middle Archaic (n=131). Yet, again the lack of excavated components in the study area inhibits addressing the five research themes with much specificity. Of the PASS (Subbasin 20) grouping of Middle Archaic components, 72 are located within 100 m of a permanent river (Table 3.62). On the table, most of the components are attributed solely to the Middle Archaic. However, some carry the notations "Early, Middle Archaic" and "Middle, Late Archaic". These notations indicate that one or more projectile point types in the site's collection cross-cuts time periods.

Table 3.62. PASS (Subbasin 20) Middle Archaic Components Within 100 M of Permanent River								
Site	**Site Type**	**Subbasin 20 Watershed**	**Major Stream**	**Distance (m) to Major Stream**	**Minor Stream**	**Distance (m) to Minor Stream**	**Topographic Setting**	**Period**
36AL5	Open habitation	G	Ohio River	100	Sewickley Creek	180	Island	Middle Archaic (though Dwyer and Fox 1997 do not cite component)
36AL15	Open habitation	F	Ohio River	70	Chartiers Creek	600	Floodplain	Middle Archaic
36AL46	Open habitation	F	Ohio River	60	Chartiers Creek	190	Terrace	Middle Archaic
36AL62	Village including Historic Indian	F	Ohio River	80	Chartiers Creek	360	Hill ridge/toe	Middle, Late Archaic (based on collections examination)
36AL158	Open habitation	G	Ohio River	100	Sewickley Creek	140	Lower Slopes	Middle Archaic
36AL480	Open habitation (though not listed in PASS as of 2001)	G	Ohio River	0	Ohio River	0	Floodplain and terraces	Middle, Late Archaic (based on collections examination)
36BT17	Open unknown function	C	Ohio River	30	Beaver River	300	Stream Bench	Middle Archaic
36BT126	Open habitation	C	Slippery Rock Creek	20	Connoquenessing Creek	36	Hill Ridge/ Toe	Middle Archaic
36BT129	Open habitation	C	Slippery Rock Creek	0	Connoquenessing Creek	160	Stream Bench	Middle Archaic
36BT131	Open habitation	C	Slippery Rock Creek	60	Connoquenessing Creek	400	Saddle	Middle Archaic
36BT153	PASS coded as Historic and Prehistoric	C	Slippery Rock Creek	90	Connoquenessing Creek	300	Terrace	Middle Archaic
36BT191	Open unknown function	C	Ohio River	80	Beaver River	220	Upland Flat	Middle Archaic
36BT321	Open unknown function	C	Slippery Rock Creek	0	Other	140	Stream Bench	Middle Archaic

Table 3.62. PASS (Subbasin 20) Middle Archaic Components Within 100 M of Permanent River (continued)								
Site	**Site Type**	**Subbasin 20 Watershed**	**Major Stream**	**Distance (m) to Major Stream**	**Minor Stream**	**Distance (m) to Minor Stream**	**Topographic Setting**	**Period**
36BT324	Rock Shelter/ Cave	C	Slippery Rock Creek	100	Other	420	Middle Slopes	Middle Archaic
36BV5	Open habitation	D	Ohio River	100	Raccoon Creek	220	Floodplain	Middle Archaic
36BV11	Open surface scatter <20m radius	D	Ohio River	40	Raccoon Creek	40	Hilltop	Middle Archaic
36BV12	Open surface scatter <20m radius	D	Ohio River	60	Raccoon Creek	70	Terrace	Middle Archaic
36BV14	Open habitation	D	Ohio River	60	Raccoon Creek	180	Floodplain	Middle, Late Archaic (based on collections examination)
36BV16	Open habitation	D	Ohio River	100	Raccoon Creek	220	Hill Ridge/ Toe	Middle Archaic
36BV17	Open habitation	D	Ohio River	0	Raccoon Creek	80	Hill Ridge/ Toe	Middle Archaic
36BV19	Open surface scatter <20m radius	D	Ohio River	80	Raccoon Creek	120	Terrace	Middle Archaic
36BV22	Open habitation	D	Ohio River	0	Raccoon Creek	290	Terrace	Middle, Late Archaic (based on collections examination)
36BV26	Open habitation	D	Ohio River	60	Raccoon Creek	120	Floodplain	Middle, Late Archaic (based on collections examination)
36BV36	Open habitation	D	Ohio River	80	Raccoon Creek	120	Terrace	Middle Archaic
36BV38	Open habitation	D	Ohio River	0	Raccoon Creek	220	Stream Bench	Middle, Late Archaic (based on collections examination)
36BV77	Open surface scatter <20m radius	B	Ohio River	70	Beaver River	180	Hill Ridge/ Toe	Middle Archaic
36BV107	Open habitation	D	Ohio River	100	Raccoon Creek	192	Stream Bench	Middle Archaic
36BV123	Open habitation	D	Ohio River	20	Raccoon Creek	60	Floodplain	Middle Archaic

Table 3.62. PASS (Subbasin 20) Middle Archaic Components Within 100 M of Permanent River (continued)								
Site	**Site Type**	**Subbasin 20 Watershed**	**Major Stream**	**Distance (m) to Major Stream**	**Minor Stream**	**Distance (m) to Minor Stream**	**Topographic Setting**	**Period**
36BV153	Open habitation	C	Slippery Rock Creek	60	Brush Creek	320	Floodplain	Middle Archaic
36BV159	Other Specialized Aboriginal Site	D	Ohio River	40	Raccoon Creek	220	Terrace	Middle Archaic
36BV162	Open habitation	D	Ohio River	60	Raccoon Creek	240	Floodplain	Middle Archaic
36BV190	Village (Including Historic Indian)	C	Slippery Rock Creek	80	Brush Creek	160	Floodplain	Middle Archaic
36BV210	Open habitation	D	Ohio River	100	Raccoon Creek	140	Terrace	Middle Archaic
36BV221	Open habitation	D	Ohio River	100	Raccoon Creek	160	Upland Flat	Middle Archaic
36BV263	Open habitation	C	Slippery Rock Creek	80	Brush Creek	180	Floodplain	Middle Archaic
36CW79	Open habitation	A	Shenango River	80	Not completed	380	Terrace	Middle Archaic
36CW100	Open habitation	A	Shenango River	0	Neshannock River	0	Not completed	Middle Archaic
36CW216	Open habitation	A	Shenango River	40	Neshannock River	480	Terrace	Middle Archaic
36CW322	Open habitation	A	Shenango River	80	Neshannock River	260	Terrace	Middle Archaic
36CW323	Open habitation	A	Shenango River	100	Neshannock River	120	Terrace	Middle Archaic
36GR61	Open habitation	E	Ohio River	50	Wheeling Creek	120	Terrace	Middle Archaic
36LR13	Open unknown function >20m radius	A	Shenango River	20	Neshannock River	60	Floodplain	Middle Archaic
36LR27	Open unknown function >20m radius	A	Shenango River	90	Neshannock River	350	Hill Ridge/ Toe	Middle Archaic

Table 3.62. PASS (Subbasin 20) Middle Archaic Components Within 100 M of Permanent River (continued)								
Site	**Site Type**	**Subbasin 20 Watershed**	**Major Stream**	**Distance (m) to Major Stream**	**Minor Stream**	**Distance (m) to Minor Stream**	**Topographic Setting**	**Period**
36LR185	Open habitation	C	Slippery Rock Creek	0	Other	0	Not completed	Middle Archaic
36LR193	PASS coded as Historic and Prehistoric	B	Ohio River	0	Mahoning River	0	Saddle	Middle Archaic
36ME87	Open unknown function >20m radius	A	Shenango River	0	Neshannock River	470	Terrace	Early, Middle Archaic (depending on point type)
36ME118	Open surface scatter <20m radius	A	Shenango River	20	Neshannock River	200	Terrace	Middle Archaic
36WH67	Open unknown function	F	Ohio River	50	Chartiers Creek	380	Hill Ridge/ Toe	Middle Archaic
36WH163	Open unknown function	F	Ohio River	100	Chartiers Creek	380	Hill Ridge/ Toe	Middle Archaic
36WH180	Open unknown function	F	Ohio River	40	Chartiers Creek	400	Floodplain	Middle Archaic
36WH203	Open unknown function	F	Ohio River	100	Chartiers Creek	450	Terrace	Middle Archaic
36WH403	Open unknown function	E	Ohio River	30	Buffalo Creek	170	Lower Slopes	Middle Archaic
36WH409	Open unknown function >20m radius	D	Ohio River	50	Raccoon Creek	360	Middle Slopes	Middle Archaic
36WH456	Open unknown function	F	Ohio River	40	Chartiers Creek	80	Floodplain	Middle Archaic
36WH477	PASS coded as Historic and Prehistoric	E	Ohio River	50	Wheeling Creek	55	Floodplain	Middle Archaic
36WH512	Open unknown function	D	Ohio River	100	Raccoon Creek	460	Hilltop	Middle Archaic

Table 3.62. PASS (Subbasin 20) Middle Archaic Components Within 100 M of Permanent River (continued)								
Site	**Site Type**	**Subbasin 20 Watershed**	**Major Stream**	**Distance (m) to Major Stream**	**Minor Stream**	**Distance (m) to Minor Stream**	**Topographic Setting**	**Period**
36WH603	Open unknown function	E	Ohio River	0	Buffalo Creek	400	Floodplain	Middle Archaic
36WH620	Open unknown function	F	Ohio River	80	Chartiers Creek	500	Terrace	Middle Archaic
36WH636	Open habitation	F	Ohio River	80	Chartiers Creek	200	Hill Ridge/ Toe	Middle Archaic
36WH648	PASS coded as Historic and Prehistoric	F	Ohio River	0	Chartiers Creek	100	Terrace	Middle Archaic
36WH976	Open unknown function	E	Ohio River	30	Buffalo Creek	140	Floodplain	Middle Archaic
36WH986	Open unknown function	D	Ohio River	80	Raccoon Creek	80	Terrace	Middle Archaic
36WH1022	Open habitation	E	Ohio River	30	Wheeling Creek	50	Floodplain	Middle Archaic
36WH1063	Open unknown function	F	Ohio River	100	Chartiers Creek	500	Terrace	Middle Archaic
36WH1065	Open unknown function	F	Ohio River	60	Chartiers Creek	240	Terrace	Middle Archaic
36WH1112	Open unknown function	D	Ohio River	60	Raccoon Creek	200	Upland Flat	Middle Archaic
36WH1113	Lithic Reduction	F	Ohio River	60	Chartiers Creek	200	Terrace	Middle Archaic
36WH1118	Lithic Reduction	F	Ohio River	100	Chartiers Creek	160	Terrace	Middle Archaic
36WH1135	Lithic Reduction	F	Ohio River	40	Chartiers Creek	410	Terrace	Middle Archaic
36WH1153	Open unknown function >20m radius	F	Ohio River	60	Other	340	Saddle	Middle Archaic
36WH1201	Open unknown function	F	Ohio River	10	Other	60	Lower Slopes	Middle Archaic
36WH1211	Open unknown function	F	Ohio River	60	Chartiers Creek	180	Stream Bench	Middle Archaic

Cultural Chronology

In 1985, George (1985) assigned the Middle Archaic to the period from 6000 B.C. to about 2500 B.C. Adovasio et al. (1998:5) have refined the Middle Archaic span and shortened it by almost half: 6000 – 4000 B.C. (7950 – 5950 B.P.). Cowin (1991:45) terminates the period at 3000 B.C. in order to include "…the broad-based notched forms such as Otter Creek…or Brewerton points evidencing distinctive basal and notch grinding." Radiocarbon dates cited by Herbstritt (1988) and Cowin (1991) ranging from 7425±200 B.P. (UGa-1111) to 5210±70 B.P. (Beta-40026) bracket the presence of bifurcated points early in the Middle Archaic and Brewerton Side Notched points late in the same period. For this study, Middle Archaic is assigned to the period 6000 B.C. to 3000 B.C. because of the solid dates for Brewerton Side Notched occurrence.

As noted by Cowin (1991:47), however, the number of Middle Archaic components confirmed through absolute dates in the region is small. She lists only four sites with dated Middle Archaic components in western Pennsylvania: 36AR188 (Brown Site), 36CL52 (State Road Ripple), 36SO153 (Spruce Run), and 36WH297 (Meadowcroft Rockshelter) (Cowin 1991). As others also have noted, organic materials recovered from features at the Zawatski Site in New York's Southern Tier were subjected to absolute dating. The Middle Archaic dates secured on the Brewerton Side Notched component at the Zawatski Site range from 6210±120 B.P. (DIC-355) to the previously mentioned 5210±70 B.P. (Beta-40026).

These dates serve as the opening dates for the Laurentian Tradition. The Laurentian Tradition was initially defined by Ritchie (1980:79-83) as present in “southeastern Ontario, southern Quebec, northern New England, and northern New York” (Ritchie 1980:79). Although Ritchie initially believed that the Tradition had its origins in boreal, circum-polar region of Canada, work by him and others in New York and in Pennsylvania have demonstrated that the Tradition was influenced by cultures to both the west and south of the core area. The Tradition is marked by the presence of a group of tools. Included in the assemblage are gouges, adzes, plummets, ground slate points and knives (including the ulu), chipped stone knives and ulus, bannerstones, and barbed bone points. The traditional projectile point hallmarks include side notched and broad bladed forms including Brewerton Side Notched during the middle and late periods of the Tradition (late Middle Archaic and Late Archaic). Hallmarks of the Tradition are now recognized among Archaic components in Michigan, central and northern Ohio, throughout Pennsylvania, northern New Jersey, and all of New York. The presence of a large suite of Brewerton points in the study collections clearly suggests that Laurentian Tradition influences are present in the study area.

In the absence of dated components, most of the sites classified as Middle Archaic in the study area are assigned to that period based on the presence of one or more of the following projectile point types: bifurcate, Brewerton Side Notched, Guilford, Hansford Side Notched (also called Pymatuning Side Notched), Morrow Mountain I and II, Otter Creek (also called Newton Falls Side Notched), Raddatz Side Notched, Stanly Stemmed, and medium triangle. As noted in the Early Archaic discussion, Otter Creek Side Notched also occurs in the late Early Archaic as do types in the LeCroy series. In the study collections, Brewerton Side Notched and Stanly Stemmed were the only Middle Archaic types

recognized. The various projectile point hallmarks are discussed below in the Artifact Assemblage section.

Site Settlement Patterns

In the larger study region (the Appalachian Plateau), the site settlement pattern for the Middle Archaic seems to replicate that of the preceding Early Archaic. Most of the sites identified to date appear to represent small camps or habitation loci (Cowin 1991; Funk 1991; Stewart and Cavallo 1991; Wall 1998). Another site type defined for the period includes possible specialized procurement loci (Funk 1991:15). These sites result from oyster exploitation along the lower reaches of the Hudson River.

Stewart and Cavallo (1991:23) suggest that a broader array of environmental settings may be exploited during the Middle Archaic in the mid- and lower reaches of the Delaware River valley than had been exploited in the Early Archaic. Their argument is that the Middle Archaic settlement pattern in this region indicates the first significant presence of sites across previously unexploited upland and lowland settings. This conclusion, however, cannot be supported with either western Pennsylvania data or study area data in particular. In the study area, the same lowland and upland settings used in the Early Archaic are used in the Middle Archaic (Table 3.63).

Table 3.63. PASS (Subbasin 20) Middle Archaic Landform, Topographic Setting, and Associated Projectile Points

Landform	Topographic Setting	Associated Projectile Points	N=	% of Base N+
Lowland	Floodplain	Bifurcate Points	15	
		Bifurcate Points (PASS), Brewerton Side Notched, Stanly Stemmed	1	
		Bifurcate Points, Brewerton Side Notched	3	
	Floodplain and terraces	Brewerton Side Notched	1	
	Rise in Floodplain	Bifurcate Points	2	
		Bifurcate Points, Brewerton Side Notched	1	
	Terrace	Bifrucate Points	1	
		Bifurcate Points	31	
		Bifurcate Points (PASS), Brewerton Side Notched, Stanly Stemmed	1	
		Bifurcate Points, Brewerton Side Notched	1	
		Brewerton Side Notched	1	
Lowland N=			**58**	**49.2**
Upland	Hill Ridge/ Toe	Bifurcate Points	11	
	Hill ridge/toe	Brewerton Side Notched	1	
	Hillslope	Bifurcate Points	2	
	Hilltop	Bifurcate Points	6	
	Lower Slopes	Bifurcate Points	4	
	Middle Slopes	Bifurcate Points	3	
	Ridgetop	Bifrucate Points	1	
		Bifurcate Points	4	
	Saddle	Bifurcate Points	10	
	Stream Bench	Bifurcate Points	9	
		Bifurcate Points, Brewerton Side Notched	1	
	Upland Flat	Bifurcate Points	3	
	Upper Slopes	Bifurcate Points	5	
Upland N=			**60**	**50.8**
Base N=			**118**	**100.0**

However, it is likely that the Middle Archaic settlement system outlined by Stewart and Cavallo (1991) is applicable to much of the Appalachian Plateau, including the study region, during the period. The system is comprised of three site classes: A, B, and C. Stewart and Cavallo (1991:28-29) equate their site Types A and B with site function classes developed by Custer (1984), Gardner (1987), and Ritchie and Funk (1973). The comparative data for Type A and B sites are presented on Table 3.64.

Table 3.64. Middle Archaic Site Function Classes Types A and B

Site Type (Stewart and Cavallo 1991)	Gardner (1987)	Ritchie and Funk (1973)	Custer (1984)
Type A	Base camp, staging areas	Large campsites	Macro and microband camps
Type B	Limited activity transient camp	Small open camps, quarry workshops, cave and rockshelters	Procurement sites
Type C	No equivalent: blends with Type B		

Type A sites in the Stewart and Cavallo (1991:28) system supported group activities and were located in proximity to a variety of resources. The sites of this class likely would be found in floodplain/terrace settings and they are the focal points in the settlement system. Site Types B and C are considered satellites of Type A sites. Type B sites are considered to be smaller versions of Type A sites; Type B sites represent the loci of small group activities. They may or may not represent specialized procurement loci. Type C sites are the result of individual activities.

The Stewart and Cavallo (1991) site function model can be applied to the Subbasin 20 sites (Table 3.65) resulting in a glimpse into the possible Middle Archaic settlement strategy in the region. As is suggested, habitation sites are likely to be found in all topographic settings and are clearly not restricted to riverine ones. There appears to be a slight preference for lowland settings, though, for the most part, site types occur in both lowland and upland settings.

Table 3.65. PASS (Subbasin 20) Middle Archaic Site Types Assigned to Site Function Classes with Topographic Setting Associations

Site Type	Site Function Assignment	Topographic Setting	N=
Lithic Reduction	B or C	Terrace	3
Open habitation	A or B	Floodplain	9
		Floodplain and terraces	1
		Hill Ridge/ Toe	4
		Island	1
		Lower Slopes	1
		Saddle	1
		Stream Bench	3
		Terrace	9
		Upland Flat	1
Open surface scatter <20m radius	A or B	Hill Ridge/ Toe	1
		Hilltop	1

Table 3.65. PASS (Subbasin 20) Middle Archaic Site Types Assigned to Site Function Classes with Topographic Setting Associations (continued)			
Site Type	**Site Function Assignment**	**Topographic Setting**	**N=**
		Terrace	3
Open unknown function	A or B	Floodplain	4
		Hill Ridge/ Toe	2
		Hilltop	1
		Lower Slopes	2
		Stream Bench	3
		Terrace	5
		Upland Flat	2
Open unknown function >20m radius	B or C	Floodplain	1
		Hill Ridge/ Toe	1
		Middle Slopes	1
		Saddle	1
		Terrace	1
Other Specialized Aboriginal Site	B or C	Terrace	1
Rock Shelter/ Cave	B or C	Middle Slopes	1
		Floodplain	1
Village	A	Hill ridge/toe	1
Total			**72**

While procurement and processing strategies changed through the Archaic stage, the few Middle Archaic features that have been isolated do not seem to be appreciably different from features described for other Archaic periods. The standard Middle Archaic features appear to be hearths, living floors or surfaces, and postmolds. These types are discussed below but in general the hearths are usually defined as shallow basins of variable size that may or may not contain fire-cracked rock. There is reference to fire-reddened soil patches in the absence of a basin. The living floors or surfaces are defined on the basis of artifacts clustered at common elevations or stratigraphic levels. No literature was found describing Middle Archaic features in the Subbasin 20 study area.

For the larger study region, Middle Archaic hearths are described by Kraft (1975) at Harry's Farm and by Stewart (1990) at Area D, both in the middle Delaware River Valley. Stewart and Cavallo (1991:31) note that the Area D hearths ranged from "small and shallow basin-shaped pits filled with brightly colored burned soil and organic sediments…[to] small, relatively circular clusters of fire cracked rock." Based on the distribution of artifacts within proximity to the hearths, activities were conducted within 2 to 3 m (6.5 to 9.8 ft) of each feature. The Harry's Farm Middle Archaic hearths also were either small shallow basins without FCR or the more typical FCR cluster. Similar hearths are noted by Stewart and Cavallo (1991:31-32), at the Faucett Site (Kinsey 1975), the Rockelein Site (Dumont and Dumont 1979), and Upper Shawnee Island (Stewart et al. 1991).

Middle Archaic features resulting from at least two forays were identified at the Sandts Eddy Site (36NM12), also on the Delaware River (Bergman et al. 1994b). All of the features were found in and on Stratum IX at the site and they included two possible hearths

(Features 9 and 93-8B), a possible hearth/trash pit (Feature 93-9), and a living floor (Feature 93-7/8). Features 93-8B and 93-9 are within Feature 93-7/8. The Feature 9 hearth was oval-shaped and measured 117 by 45 by 20 cm (46 by 18 by 8 in). It was filled with dense charcoal subsequently dated to 7080±60 B.P. (Beta-51500). The excavated portion of the living floor measured at least 4 m^2 (43 ft^2) and was marked by dense concentrations of cores, flakes, and cobble tools. A sufficient quantity of hazelnut was recovered from the living floor for radiocarbon dating. The radiocarbon date was 7330±60 B.P.

Subsistence and Seasonality Studies

Ritchie (1980) suggests an emphasis on gathering and processing seed and nut foods because of an increased incidence of nutting stones, mortars, pestles, manos, and metates by the late Middle Archaic with the onset of the Laurentian Tradition (Funk 1991). Certainly, the later levels at Meadowcroft Rockshelter (36WH297) yielded various types of ground stone and the Emil Alum collections, though not restricted to Archaic components, contain a variety of netsinkers and ground stone (Appendix D) that may support this increased incidence. The Site 36AL480 Davis Phase I/II assemblage, which presumably resulted from investigation of some portion of the Archaic occupation at that site, however, lists no ground stone, although netsinkers are noted in the catalog.

Cowin (1991) supports the likely presence of ground and pecked stone in the period, but notes the lack of single components upon which to define the assemblage characteristics. Elsewhere, ground and pecked stone in a broad variety appear during the period. Stewart and Cavallo (1991) note the presence of adzes, anvils, choppers, netsinkers, and teshoas at various sites in the Delaware drainage, and Funk (1991) notes the same type of items in New York, but only after the onset of the Laurentian Tradition in the late Middle Archaic. Ritchie (1980:79) defines the Laurentian Tradition on the basis of a suite of diagnostic traits including:

> "the gouge; adz; plummet; ground slate points and knives, including the semi-lunar form or ulu, which occurs also in chipped stone; simple forms of bannerstone; a variety of chipped-stone projectile points, mainly broad-bladed and side-notched forms; and the barbed bone point."

While Ritchie's (1980) Laurentian Tradition artifact suite does not contain ground stone per se, he does note that the suite in general is adapted to local conditions in order to process most fully a broad-spectrum of floral and faunal species.

The increased number and variety of ground and pecked stone items in the Middle Archaic over the preceding periods is consistently cited as a result of broad spectrum resource utilization. This argument presupposes that once the nut resources, in particular, were routinely harvested and processed, the need for hammerstones, milling tools, and other processing items became apparent. It is not altogether clear, however, that earlier Paleoindian and Early Archaic peoples did not rely on nut foods also as nut species have certainly been recovered in those contexts. Finally, it is difficult to imagine that the presence

of netsinkers in Middle Archaic assemblages supports a contention that this is the first time fish or eels were harvested.

The site settlement system posited for the Middle Archaic period could clearly operate within a seasonal round. The presence of sites in both lowland and upland settings suggests that the population was cognizant of the variable resources of both settings and most likely exploited them depending on seasonal availability. This hypothesize certainly seems to be supported by the distribution of Middle Archaic components over the Subbasin 20 landscape (see Table 3.65 above).

Artifact Assemblages and Lithic Technologies

The lack of single component or separable Middle Archaic components inhibits the discussion of the period's hallmark and/or typical artifact assemblage characteristics. Further, discussion of characteristic lithic technologies for the period is limited by the small Subbasin 20 database. The larger regional database provides the basis for much of the discussion below.

Chipped Stone

Middle Archaic types include the rare Guilford and Morrow Mountain I and II point styles found primarily in the lower UOV south of the West Virginia panhandle and the scarce Raddatz Side Notched, recovered primarily in Ohio and West Virginia rather than Pennsylvania. The most common Middle Archaic point style is the Stanly Stemmed (George 1985:183; Justice 1987). As noted above, medium triangulars (Stewart and Cavallo 1991), Big Sandy II points (Kneberg 1956), and Otter Creek / Big Sandy forms (Ritchie 1971) also appear during the Middle Archaic. Finally, Brewerton Side Notched points appear relatively late in the period and are a hallmark of the Laurentian Tradition. While bifurcate types continue into the Middle Archaic, as discussed above, they seem to first appear in Early Archaic times.

Overall, the Middle Archaic projectile point and artifact assemblage characteristics are not well defined especially in the UOV and there are several overlapping point styles that either first appear in the Early Archaic or continue into the Late Archaic. The Middle Archaic projectile point types identified in the study collections are listed on Table 3.66 and these and other Middle Archaic types are discussed below.

Table 3.66. Study Collection Middle Archaic Projectile Point Types

Period	Type	N =
Middle Archaic	Stanly Stemmed	3
Middle Archaic, Late Archaic	Brewerton Side Notched	78

A feature containing Brewerton Side Notched points at the Brown Site (36AR188) on the Allegheny River yielded a corrected ^{14}C date of 4140±240 B.C. George and Davis (1986:19) suggest that the point type "persisted with little change for at least two millennia in the Upper Ohio Valley." The 36AR188 feature date, and a date of 3680±115 B.C. obtained

at the Zawatski Site (30CA69) on a Brewerton Side Notched component, support the type's origin in the late Middle Archaic, though its sister types, Brewerton Corner Notched and Brewerton Eared Notched, are apparently Late Archaic hallmarks. Younger dates also confirm its presence in Late Archaic contexts in Pennsylvania, West Virginia, and New York (George and Davis 1986:19-20).

The 78 Brewerton Side Notched points in the study collection clearly outnumber the corner notched (n=41) and eared notched (n=4) examples. The seemingly significant difference in the totals actually may reflect the longer temporal span of the side notched varieties over the other two styles. The summary data for the Brewerton Side Notched examples in the study collection are presented on Table 3.67. The bolded and italicized measurements on the table below indicate artifacts that have been resharpened or fragmented. These measurements should not be used if indices are being created for comparative purposes.

Table 3.67. Study Collection Brewerton Side Notched Projectile Point Summary Data

Site	Object Length	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Material	Appendix D Figure #
36AL62	25.5	17.6	17.6	19.4	7.0	Chert, Onondaga - like	D14
36AL62	27.8		18.0		7.0	Chert, Onondaga - like	D14
36AL62	31.7	25.1	17.8	20.5	6.7	Chert, unidentified	D16
36AL480	32.50					Chert, unidentified (no cortex)	D26
36AL480	41.30					Chert, unidentified (no cortex)	D26
36AL480	36.60					Chert, Uniontown (some patination)	
36BV3	26.04	18.51	15.99	17.71	5.79	Chert, unidentified	D29
36BV3	27.96	11.01	20.51	18.05	7.34	Chert, unidentified	D28
36BV3	28.38	18.72	19.69	18.79	7.08	Chert, Onondaga	D29
36BV3	29.32	22.10	15.70	16.80	5.38	Chert, unidentified	D29
36BV3	29.44	16.68	21.21	20.28	6.78	Chert, unidentified	D29
36BV3	30.55	23.42	22.24	17.19	7.06	Chert, unidentified	D28
36BV3	31.73	23.20	22.33	18.98	7.06	Chert, Onondaga	D29
36BV3	32.29	25.54	30.75	18.88	7.09	Chert, unidentified	D28
36BV3	32.42	23.60	25.78	19.05	7.32	Chert, Onondaga	D28

Table 3.67. Study Collection Brewerton Side Notched Projectile Point Summary Data (cont.)							
Site	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Material**	**Appendix D Figure #**
36BV3	32.73	24.75	16.30	16.09	5.15	Chert, Onondaga	D29
36BV3	34.05	25.18	28.56	21.54	7.95	Chert, unidentified	D28
36BV3	34.20	25.56	19.89	18.20	7.07	Chert, unidentified	D29
36BV3	35.31	25.95	18.42	13.92	6.87	Chert, unidentified	D28
36BV3	40.53	29.74	23.81	15.78	5.99	Chert, Kanawha	D30
36BV3	41.53	35.24	24.37	17.32	7.85	Chert, unidentified	D28
36BV3	44.12	33.71	20.21	22.45	9.47	Chert, Onondaga	D29
36BV3	44.97	35.19	21.94	16.74	9.17	Chert, Onondaga	D28
36BV10	***25.33***	***17.48***	18.81	20.54	6.34	Chert, Onondaga	D36
36BV10	40.38	29.50	20.39	19.64	8.39	Chert, Onondaga	D36
36BV10	40.62	29.69	21.24	***17.95***	7.55	Chert, Onondaga	D36
36BV13	***25.41***	***15.07***	19.85	17.76	6.28	Chert, unidentified	D42
36BV13	27.68	17.14	22.62	14.86	6.31	Chert, Onondaga	D42
36BV13	32.34	22.78	23.60	19.49	8.19	Chert, Onondaga	D42
36BV13	33.78	27.18	21.73	18.24	7.87	Chert, Onondaga	D42
36BV13	44.25	35.25	20.62	18.22	6.49	Chert, Onondaga	D42
36BV14	29.87	20.02	18.57	17.25	6.20	Chert, Onondaga	D46
36BV14	33.61	26.78	18.36	12.00	6.37	Chert, Onondaga	D46
36BV14	34.39	27.66	20.03	14.42	6.23	Chert, Onondaga	D46
36BV14	34.96	27.90	17.38	16.09	5.85	Rhyolite	D46
36BV21	***23.68***	***12.64***	15.44	***18.85***	5.38	Chert, unidentified	D48
36BV21	24.42	16.21	16.18	20.13	8.09	Chert, unidentified	D48
36BV21	***24.73***	***16.05***	18.62	18.79	5.76	Chert, unidentified	D48
36BV21	25.93	17.64	16.70	19.02	5.53	Chert, unidentified	D48
36BV21	27.31	20.06	18.63	19.10	6.83	Chert, Onondaga	D48
36BV21	27.93	20.67	20.19	19.91	5.62	Chert, Onondaga	D50
36BV21	28.23	20.09	18.13	21.26	5.65	Chert, Onondaga	D48
36BV21	30.03	19.71	17.85	20.31	6.90	Chert, Onondaga	D48

Table 3.67. Study Collection Brewerton Side Notched Projectile Point Summary Data (cont.)							
Site	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Material**	**Appendix D Figure #**
36BV21	31.24	22.49	14.61	15.55	6.80	Chert, unidentified	D48
36BV21	***31.24***	***21.49***	18.98	20.32	5.95	Chert, Onondaga	D48
36BV21	31.33	23.30	17.86	20.45	6.10	Chert, unidentified	D48
36BV21	31.51	22.01	16.61	***16.88***	6.41	Chert, Onondaga	D50
36BV21	***31.60***	***23.00***	20.29	18.34	7.39	Chert, Onondaga	D50
36BV21	32.05	23.73	21.63	23.58	6.52	Chert, unidentified	D49
36BV21	35.63	28.74	27.40	18.03	6.14	Chert, Onondaga	D49
36BV21	35.89	26.81	25.24	18.90	6.27	Chert, Onondaga	D49
36BV22	26.11	18.44	22.25	19.00	6.64	Chert, Onondaga	D54
36BV22	***28.23***	***19.40***	23.16	21.89	7.59	Chert, Kanawha	D54
36BV22	33.67	25.45	21.27	19.84	7.34	Chert, unidentified	D54
36BV22	35.58	27.53	22.54	21.94	7.51	Chert, unidentified	D54
36BV22	36.53	29.93	20.44	10.51	8.93	Chert, Kanawha	D56
36BV22	***38.18***	***27.43***	19.77	18.03	7.47	Chert, unidentified	D54
36BV22	39.06	28.67	23.59	***18.01***	6.24	Chert, unidentified	D54
36BV22	39.09	30.68	22.96	18.23	7.11	Chert, unidentified	D56
36BV22	40.53	31.84	21.80	19.47	6.24	Chert, Onondaga	D54
36BV22	40.60	32.12	18.69	16.65	8.29	Chert, Onondaga	D54
36BV22	42.03	33.07	21.16	18.71	7.74	Chert, Onondaga	D54
36BV22	***45.04***	***33.17***	24.13	18.64	6.72	Chert, unidentified	D54
36BV22	47.82	28.26	25.19	18.07	7.14	Chert, unidentified	D54
36BV24	29.10	19.49	17.57	17.49	5.71	Chert, unidentified	D60
36BV26	19.32	11.05	14.93	17.96	5.68	Chert, Onondaga	D66
36BV26	***19.57***	***12.63***	16.08	17.59	6.07	Chert, Onondaga	D66
36BV26	***25.32***	***16.95***	16.44	16.38	6.09	Chert, Onondaga	D66
36BV26	26.11	19.81	15.52	17.07	4.99	Chert, Onondaga	D66
36BV26	29.97	23.48	16.40	17.43	5.32	Chert, Onondaga	D66
36BV26	31.79	23.08	21.04	21.20	6.25	Chert, unidentified	D66

Table 3.67. Study Collection Brewerton Side Notched Projectile Point Summary Data (cont.)							
Site	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Material**	**Appendix D Figure #**
36BV26	39.23	27.83	27.21	21.45	8.56	Chert, Kanawha	D66
36BV26	39.56	60.21	19.83	***10.38***	8.28	Chert, Onondaga	D67
36BV38	28.24	21.10	22.54	24.91	6.49	Chert, Onondaga	D69
36BV38	32.38	***24.99***	21.56	20.02	7.01	Chert, unidentified	D69
36BV38	32.66	25.35	23.87	***19.71***	7.49	Chert, Onondaga	D69
36BV38	35.10	16.02	16.01	17.95	6.45	Chert, unidentified	D69
36BV38	36.35	27.45	20.44	26.94	7.16	Chert, Onondaga	D69

The Morrow Mountain I and II types and Raddatz Side Notched points are absent from the study collections. Morrow Mountain I and II points may have an ancestral relationship to various Late Archaic straight and contracting stem types including the Savannah River Cluster (Justice 1987:105). Both Morrow Mountain I and II varieties developed in the deep South but are present through the lower and middle Ohio River Valley. The types appear in low numbers as far northeast as Neville in New Hampshire (Justice 1987:107). Raddatz Side Notched points are assigned by Justice (1987:68) to the Middle Archaic and they are part of the Large Side Notched Cluster that also contains the earlier Big Sandy type.

The Stanly Stemmed type is the hallmark form on the Pennsylvania side of the study area. Its representation in the study collections, however, is virtually negligible (n=3; Table 3.68) and in the larger PASS (Subbasin 20) database it is not listed at all. The reason for the absence is not known as the type distribution encompasses much of the study area extending eastward across the unglaciated Appalachian Plateau. In the study collections, only one of the three examples was within the size range for the type listed in Justice (1987:246). The size range is 40-80 mm (1.5 – 3.1 in) length and 25-45 mm (.9 – 1.7 in) width. The shortness of the item from Site 36BV26 did not appear to be the result of reworking.

Table 3.68. Study Collection Stanly Stemmed Projectile Point Summary Data							
Site	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Material**	**Appendix D Figure #**
36BV22	37.76	31.20	30.03	15.21	6.64	Chert, Onondaga	D56
36BV22	42.87	34.23	29.84	19.82	7.60	Chert, Onondaga	D56
36BV26	28.88	16.08	16.66	12.18	4.99	Chert, unidentified	D66

Other Artifact Classes

The inability to discriminate Middle Archaic occupational debris from that left by earlier or later inhabitants at the same site results in a muddy picture of other artifact classes associated with the time period in Subbasin 20. In New York, Funk's (1988, 1991) early Middle Archaic South Hill phase sites are marked by the presence of hammerstones and pitted stones. Funk (1988, 1991) classifies the South Point phase as a Proto-Laurentian manifestation and links it with other Large Side Notched Cluster cultures.

The subsequent Laurentian Tradition, discussed earlier, is also marked by a variety of ground and pecked stone. Included in this tradition are both ground slate and chipped stone ulus, bannerstones, plummets, gouges, and adzes (Ritchie 1980). With the possible exception of the ulus, however, all of these items continue to be manufactured into the subsequent Late Archaic.

Research Issues – Middle Archaic

A series of research questions for the Middle Archaic and based on the PASS (Subbasin 20) and study collection data alone are presented below. The research questions are focused on two areas: settlement systems and artifact assemblage.

As was the case with the Early Archaic, the Middle Archaic period has developed settlement models (Custer 1984, Gardner 1987, Ritchie and Funk 1973, Stewart and Cavallo 1991) which should be tested for applicability against the PASS database. The preliminary test conducted herein suggests that employment of the Stewart and Cavallo (1991) model results in a more well-defined impression of the Middle Archaic setting-selection processes. By using the PASS UTM and site-size data, further refinement of the model in the study region is possible. Research avenues pertinent to this issue and settlement strategies in general include the following.

- The Stewart and Cavallo (1991) model of Middle Archaic site distribution posits three site types (A, B, and C). Does an examination of the PASS (Subbasin 20) site-specific locational data and site-size data support the applicability of their model to the area?

- Would a re-examination of the PASS (Subbasin 20) site type data, reclassifying the sites based on sizes and assemblage characteristics, result in an appreciably different picture of site-settlement strategies in the area than is generated by the current, broad categories?

The study collection data for the Middle Archaic suggests that manufacture of projectile points during the period may have been restricted because of raw material type. Middle Archaic points were often shorter than their expected length range. It is extremely difficult, if not impossible, to determine if a chipped stone tool has been manufactured from local pebble cherts. In the case of the shorter-than-expected Middle Archaic tools, the question is raised:

- Are certain tool forms diminutive because they are being manufactured from pebbles and cobbles in restricted size classes?

Both Herbstritt (personal communication 2001) and George (personal communication 2001) believe that reliance on local pebble cherts is greater than the record might suggest and that a means of determining this is by examining tool sizes rather than attempting to identify remnant cortical rind. The Middle Archaic, and that from subsequent periods as well, suggests that there is a consistent pattern in size reduction.

The elements of the Middle Archaic tool assemblage other than projectile points are not well understood in the study area. The dominance of Brewerton projectile points in area collections suggests that Laurentian Tradition ground and pecked stone, in addition to barbed bone points, may appear in some numbers. The questions pertinent to this topic are as follows.

- One of the Laurentian Tradition hallmark artifact types is the ground slate or chipped stone ulu (semi-lunar knife). What is the distribution of this artifact type in the UOV and does it co-occur with Brewerton projectile points?

- If Laurentian Tradition ground and pecked stone is not co-occurring in Brewerton projectile point contexts what types of ground and pecked stone artifacts are appearing and are they indicative of particular cultural groups?

Late Archaic (3000 B.C. – 1000 B.C.)

Late Archaic presence, based almost exclusively on diagnostic projectile points, has been documented at 410 sites in the Ohio and Pennsylvania portions of the study area. Of the total, 36 sites in the PASS (Subbasin 20) sample are located within 100 m of a permanent river (Table 3.69).

Cultural Chronology

George's (1985) discussion of the Archaic period assigns the Late Archaic to the period from about 2500 B.C. to 1000 B.C. based on the radiocarbon assays available at the time. Adovasio et al. (1998:5) lengthen the period and assign the Late Archaic to the timeframe from 4000 B.C. to 1700 B.C. (5950 – 3650 B.P.). Cowin (1991) terminates the Middle Archaic at 3000 B.C. because of the first appearance of the Brewerton Side Notched projectile points in combination with the onset of Laurentian Tradition influences in the region. Her argument is persuasive, and the Late Archaic beginning date is likely closer to 3000 B.C. than the posited dates of either 2500 B.C. or 4000 B.C. Thus, the 3000 B.C. date should be used as the hallmark.

Table 3.69. PASS (Subbasin 20) Late Archaic Components Within 100 M of Permanent River								
Site	**Site Type**	**Subbasin 20 Watershed**	**Major Stream**	**Distance (m) to Major Stream**	**Minor Stream**	**Distance (m) to Minor Stream**	**Topographic Setting**	**Period**
36AL6	Earthworks	F	Ohio River	60	Chartiers Creek	520	Rise on floodplain	Late Archaic (based on collection examination and PASS)
36AL362	Open unknown function	G	Ohio River	10	Sewickley Creek	10	Terrace	Late and Terminal Archaic
36AL480	Open habitation (though not listed in PASS as of 2001)	G	Ohio River	0	Ohio River	0	Floodplain and terraces	Late Archaic (based on collection examination)
36BT2	Rock Shelter/ Cave	C	Slippery Rock Creek	40	Connoquenessing Creek	280	Terrace	Late Archaic
36BT16	Open unknown function	C	Ohio River	70	Beaver River	360	Stream Bench	Late Archaic
36BT25	Open habitation	C	Slippery Rock Creek	80	Connoquenessing Creek	400	Lower Slopes	Late Archaic
36BT44	Open unknown function	C	Slippery Rock Creek	0	Connoquenessing Creek	300	Upland Flat	Late Archaic
36BT172	Open habitation	C	Slippery Rock Creek	0	Connoquenessing Creek	350	Saddle	Late and Terminal Archaic
36BT209	Open unknown function	A	Allegheny River	40	Other	270	Stream Bench	Late Archaic
36BT228	Open unknown function	C	Slippery Rock Creek	100	Brush Creek	250	Terrace	Late Archaic
36BT230	Unknown	C	Slippery Rock Creek	200	Connoquenessing Creek	100	Stream Bench	Late Archaic
36BT236	Open habitation	C	Slippery Rock Creek	40	Connoquenessing Creek	200	Lower Slopes	Late Archaic
36BT239	Open habitation	C	Slippery Rock Creek	20	Connoquenessing Creek	100	Middle Slopes	Late and Terminal Archaic
36BT240	Open habitation	C	Slippery Rock Creek	0	Connoquenessing Creek	30	Stream Bench	Late Archaic
36BV11	Open surface scatter <20m radius	D	Ohio River	40	Raccoon Creek	40	Hilltop	Late Archaic (based on collection examination)
36BV14	Open habitation	D	Ohio River	60	Raccoon Creek	180	Floodplain	Late Archaic (based on collection examination)
36BV22	Open habitation	D	Ohio River	0	Raccoon Creek	290	Terrace	Late Archaic (based on collection examination and PASS)
36BV26	Open habitation	D	Ohio River	60	Raccoon Creek	120	Floodplain	Late Archaic (based on collection examination)

Table 3.69. PASS (Subbasin 20) Late Archaic Components Within 100 M of Permanent River (continued)								
Site	**Site Type**	**Subbasin 20 Watershed**	**Major Stream**	**Distance (m) to Major Stream**	**Minor Stream**	**Distance (m) to Minor Stream**	**Topographic Setting**	**Period**
36BV38	Open habitation	D	Ohio River	0	Raccoon Creek	220	Stream Bench	Late Archaic (based on collection examination)
36BV194	Rock Shelter/ Cave	B	Ohio River	0	Beaver River	240	Stream Bench	Late and Terminal Archaic
36LR85	Open unknown function >20m radius	C	Slippery Rock Creek	60	Connoquenessing Creek	220	Floodplain	Late and Terminal Archaic
36LR161	Open unknown function >20m radius	A	Shenango River	60	Neshannock River	140	Terrace	Late and Terminal Archaic
36M85	Open unknown function >20m radius	A	Shenango River	60	Neshannock River	180	Terrace	Late and Terminal Archaic
36WH171	Open habitation	F	Ohio River	70	Chartiers Creek	270	Saddle	Late and Terminal Archaic
36WH313	Open habitation	D	Ohio River	20	Other	40	Floodplain	Late and Terminal Archaic
36WH314	Open habitation	D	Ohio River	20	Other	300	Floodplain	Late and Terminal Archaic
36WH374	Lithic Reduction	D	Ohio River	5	Raccoon Creek	330	Ridgetop	Late and Terminal Archaic
36WH389	Open unknown function	D	Ohio River	0	Raccoon Creek	400	Ridgetop	Late and Terminal Archaic
36WH566	Open habitation	D	Ohio River	20	Other	100	Terrace	Late Archaic
36WH611	Open unknown function	E	Ohio River	80	Buffalo Creek	330	Stream Bench	Late and Terminal Archaic
36WH1063	Open unknown function	F	Ohio River	100	Chartiers Creek	500	Terrace	Late and Terminal Archaic
36WH1111	Open unknown function	D	Ohio River	90	Other	100	Middle Slopes	Late Archaic
36WH1155	Open unknown function >20m radius	F	Ohio River	20	Other	80	Terrace	Late Archaic
36WH1162	Lithic Reduction	F	Ohio River	40	Chartiers Creek	160	Floodplain	Late Archaic
36WH1194	Open unknown function	F	Ohio River	10	Other	100	Middle Slopes	Late Archaic
36WH1195	Open unknown function	F	Ohio River	60	Other	100	Lower Slopes	Late and Terminal Archaic

The beginning and end dates for the period also coincide with that proposed by Custer (1996) for the eastern Appalachian Plateau in Pennsylvania and the upper Delmarva peninsula. In the upper Delaware Valley, Kraft (1972) places the terminus of the Late Archaic at about 750 B.C. based on dates for Orient Fishtails which he assigns to a terminal expression of the period. Finally, Ritchie (1980) terminates the Late Archaic at about 1300 B.C. and creates a "Transitional Stage" from about 1300 B.C. to 1000 B.C. to accommodate his Frost Island and Orient phases. The latter coincides with Kraft's (1972) Orient Fishtail Tradition.

In the study area, the Late Archaic is not broken into phases in either the Pennsylvania or Ohio sections. However, Mayer-Oakes (1955) did define the so-called Panhandle Archaic in northern West Virginia and occupations assignable to this phase have been identified in Pennsylvnaia. This Late Archaic manifestation is defined on the co-occurrence of a group of traits including mussel and seasonal fish harvesting and Steubenville projectile points. East et al. (1996) identified a Panhandle Archaic occupation at Scenery Hill 1 (Site 36AL375) based on the presence of Steubenville Variant points. The excavations at this upland bench site, however, did not recover evidence of either mussel or fish exploitation. Panhandle Archaic sites, a subset within Late Archaic and Terminal Archaic, are differentiated from sites of either of those periods by a dominance of mussel and fish debris in addition to tools, including barbed fish hooks and netsinkers that were probably used in mussel and fish harvesting.

Site Settlement Patterns

The pattern of seasonal resource scheduling begun during the Early Archaic is considered to have reached its peak efficiency during Late Archaic (Caldwell 1958). The PASS (Subbasin 20) data suggest that Caldwell's (1958) model of optimal foraging cycles is probably applicable, though the Late Archaic components tend to be slightly concentrated in both the lowland and upland river valleys (Table 3.70). The distribution of Late Archaic components (as represented by sites yielding diagnostic projectile points) seems to reinforce the idea that lowland, or at least river margin localities, are preferred over other settings.

Using Caldwell's model of task group dispersion from optimally located base camps is not dissimilar to Stewart and Cavallo's (1991) Middle Archaic model. In Caldwell's (1958) model, the semi-permanent or permanent base camps implement the procurement rounds. Base camps remain situated along the terraces of the major stream valleys. Smaller hunting and extractive camps focused on exploitation of more diffuse or seasonally restricted resources are generally located in the hinterlands on small streams, adjacent to marshes or large swamps, and near large springs situated well back in the hills (Ritchie and Funk 1973; Ritchie 1980).

Table 3.70. PASS (Subbasin 20) Late Archaic Landform, Topographic Setting, and Associated Projectile Points				
Landform	**Topographic Setting**	**Associated Projectile Points**	**N=**	**% of Base N=**
Lowland	Floodplain	Brewerton Corner Notched, Lamoka	1	
		Brewerton Corner Notched, Late Archaic Stemmed,	1	
		Brewerton Corner Notched, Late Archaic Stemmed, Late Archaic Stemmed Cluster	1	
		Brewerton Corner Notched, Susquehanna Broad	1	
		Steubenville/Fox Creek	6	
	Floodplain and terraces	Merom/Trimble Side Notched	1	
	Rise in Floodplain	Brewerton Corner Notched	1	
		Koens Crispin / Savannah River	1	
	Rise on floodplain	Brewerton Eared Notched, Steubenville Stemmed, Steubenville/ Fox Creek (PASS)	1	
	Terrace	Brewerton Corner Notched, Lamoka, Poplar Island	1	
		Brewerton Corner Notched, Snook Kill	1	
		Koens Crispin / Savannah River	1	
		Late Archaic Stemmed, Steubenville/Fox Creek (PASS), Steubenville Lanceolate, Steubenville Stemmed	1	
		Steubenville/Fox Creek	5	
Lowland N=			**23**	**52.3**
Upland	Hill Ridge/ Toe	Koens Crispin / Savannah River	1	
		Lehigh/Snook Kill	1	
		Steubenville/Fox Creek	1	
	Hilltop	Brewerton Corner Notched, Snook Kill	1	
		Steubenville/Fox Creek	1	
		Steubenville/Fox Creek; Koens Crispin/Savannah River	1	
	Lower Slopes	Koens Crispin / Savannah River	1	
	Middle Slopes	Steubenville/Fox Creek	1	
	Ridgetop	Steubenville/Fox Creek	3	
	Saddle	Steubenville/Fox Creek	2	
	Stream Bench	Brewerton Eared Notched, Snook Kill, Steubenville Stemmed	1	
		Koens Crispin / Savannah River	1	
		Lehigh/Snook Kill	1	
		Steubenville/Fox Creek	4	
	Upland Flat	Steubenville/Fox Creek	1	
Upland N=			**21**	**47.7**
Base N=			**44**	**100.0**

The range of features expected at either semi-permanent or permanent base camps are exemplified by those defined at Scenery Hill 1 (36AL375). There, the Late Archaic features included amorphous, ovoid, circular, and slab-lined basins; rock concentrations; and a rock-filled cylinder (East et al. 1996). All of the features had been truncated by plowing. Therefore, they were extremely hard to identify at the plowzone/B horizon interface, and were not definable until encountered as concentrations of rock fragments or carbonized organics in the subsoil (East et al. 1996:110). East et al. (1996:124), considering the features and associated artifact assemblage, interpret the occupation at the site as the remnants of a base camp with defined activity areas utilized during single time periods. They also note that outlying artifact concentrations to the main concentration may represent "additional short-duration, ephemeral occupations, or localized activity areas" (East et al. 1996:124).

Subsistence and Seasonality Studies

Evidence for the floral and fauna being exploited by the Late Archaic peoples has been recovered from feature contexts in the study area and in nearby regions. In the study area, bifacial tools have been subjected to protein residue studies and these have resulted in the acquisition of heretofore unavailable faunal data. Knepper and Petraglia (1993:127-128, Table 8-12) report that Late Archaic projectile points recovered from Site 36BV292 (the Connoquenessing Site) yielded evidence of protein residues from the following serum groups: chicken, deer, dog, and guinea pig. The chicken group encompasses chicken, grouse, turkey, pheasant, and quail; European-introduced chicken would not have been present but evidence of the other species has been recovered in bone form from other Late Archaic sites (Knepper and Petraglia 1993). The deer group includes both deer and moose. Deer is most commonly recovered in bone form; moose does not commonly occur in faunal assemblages in the eastern United States. The dog group encompasses dog, fox, and wolf, any of which could have been hunted or present in a hunting area. The guinea pig group includes beaver, porcupine, and red squirrel. Any of the North American representatives could have been hunted as sources of fur, quills, bone, or meat.

The floral assemblages recovered from the features at Site 36AL375 (Scenery Hill 1) included hickory (*Carya ovata*) and black walnut (*Juglans nigra*) nutshell and a single carbonized bedstraw (*Galium* spp.) seed also was recovered. East et al. (1996:110) discount the latter as "introduced accidentally from plants growing nearby." Similarly, the Connoquenessing Site (36BV292) Late Archaic ethnobotanical remains recovered from Feature 51, discussed earlier and summarized on Table 3.5, indicate possible use of hickory (*Carya ovata*), butternut (*Juglans cinera*), and black walnut (*Juglans nigra*) (Knepper et al. 1993). The utilization of these nut and grass species, also exploited in both earlier and later periods, reinforces the idea that the Late Archaic peoples were practicing season-specific resource exploitation.

In the region, the southern New York data indicate that both hunting and fishing were occurring. This conclusion is based on the presence of unmodified bone, projectile points, atlatl weights (in Brewerton period contexts), and barbed bone harpoons (Ritchie 1980:94). Ritchie (1980:94) noted that no true fishhooks had been recovered as of his writing. In the Finger Lakes region, a Late Archaic midden yielded a broad suite of faunal remains

including dog, gray wolf, black bear, raccoon, otter, bobcat or lynx, woodchuck, gray squirrel, muskrat, beaver, porcupine, white-tailed deer, and elk. Avian species included turkey, ruffed grouse, passenger pigeon, in addition to duck. Fish included both northern pike and bullhead and three varieties of turtles were present (Ritchie 1980:107). These included box, wood, and snapping turtles.

Artifact Assemblages and Lithic Technologies

As with earlier Archaic periods, the recovered Late Archaic artifact assemblages are comprised primarily of chipped, ground, and pecked stone objects. Some shell, bone, and antler recovery also has occurred but the recovery rate for these artifact classes is low.

Indicative of the range of artifact classes at transitional Late Archaic to Terminal Archaic sites is the assemblage recovered at Scenery Hill 1 (36AL375). The large chipped stone debitage collection from that site was comprised of 29,501 items consisting of non-diagnostic shatter; primary, secondary, and tertiary core trimming; and biface thinning flakes. Also recovered were 306 cores, the aforementioned Steubenville projectile points, a non-diagnostic projectile point, 139 bifaces, and 41 specialized implements (East et al. 1996:101). These items, in total, were manufactured predominately on Monongahela chert (94.7%), with Kanawha, Ten Mile Run, Uniontown, Flint Ridge, Upper Mercer, Brush Creek, Onondaga, and LPC cherts also recovered. Also noted as occurring among the chipped stone items were ones made of chalcedony, sandstone, siltstone, and hematite (East et al. 1996:102-103). The incidence of Monongahela chert use seems high but the site was located near to a source location. As seems apparent in the study collections examined, the incidence of non-local cherts (exemplified by types such as Kanawha and Flint Ridge), less than 10 percent, is in keeping with other collections.

Chipped Stone

Late Archaic chipped stone raw materials were not significantly different from those utilized in the preceding or subsequent periods. Reports detailing Late Archaic assemblages or individual artifacts indicate that the following chert types were being utilized: Brush Creek, Delaware, Flint Ridge (as import), Kanawha, Monongahela, Plum Run, Ten Mile Run, Upper Mercer, and Zaleski (East et al. 1996; Petraglia et al. 1992b). The cherts are being recovered as glaciofluvial pebble and cobbles, as quarried floatstone, or as imported blanks. Chipped stone items made of chalcedony, sandstone, siltstone, and hematite also were noted among the assemblages (East et al. 1996:102-103).

In the chipped stone assemblages for the period, diagnostic non-projectile point traits are not common. East et al. (1996:135) called out notched flakes in the Panhandle Archaic assemblage at Scenery Hill 1 (Site 36AL375). These “expedient flake tools [are interpreted as] for working small diameter (6 mm – 12 mm, 0.24 in – 0.48 in) objects, possibly for preparing wood foreshafts or for shaping bone or antler tools” (East et al. 1996:135). As such, they may not be indicative of the period but rather functional activities conducted at the site.

By the Late Archaic, a variety of projectile points are differentially represented across the region and within the study area. The types include Ashtabula Broad, Brewerton Eared, Side and Corner Notched; Koens-Crispin Broadspears; Lamoka (early), Steubenville/Fox Creek (late), Susquehanna Broadspears, and again, medium triangulars (Church and McDaniel 1992; Miller 1994) (Table 3.71). Also present are types such as Late Archaic Side Notched, and Late Archaic Stemmed and Stemmed Cluster. True exotic types are difficult to discriminate and such distinction seems to hinge on the use of non-local raw materials in their manufacture or in their incidence level. 'Non-local' or uncommon types reported and in the study collection include Merom / Trimble points (36AL480; also 46MR95, Church and McDaniel 1992:41), Normanskill-like (36AL124), Poplar Island (36BV10), and Snook Kill (36BV11, 36BV13).

The Ashtabula Broad point was defined by Mayer-Oakes (1955:62) and Justice (1987:167-169) classifies the type as a "morphological correlate of the Susquehanna Broad". The Ashtabula type tends to have longer stems than Susquehanna Broadspears and some classify it as a crude variant. No Ashtabula Broad projectile points were identified in the study collections though Susquehanna Broads were defined.

Table 3.71. Study Collection Late Archaic Projectile Point Types

Period	Type - Final	N=
Late Archaic	Brewerton Corner Notched	41
Late Archaic	Brewerton Eared Notched	4
Late Archaic, Terminal Archaic	Koens-Crispin Broad	1
Late Archaic	Lamoka	4
Late Archaic	Lamoka-like (possibly resharpened)	1
Late Archaic	Late Archaic Side Notched	1
Late Archaic	Late Archaic Stemmed	12
Late Archaic	Late Archaic Stemmed Cluster	3
Late Archaic	Merom/Trimble	1
Late Archaic	Normanskill-like	1
Late Archaic	Poplar Island	1
Late Archaic, Terminal Archaic	Snook Kill	5
Late Archaic, Terminal Archaic	Steubenville Lanceolate and Lanceolate-like	3
Late Archaic, Terminal Archaic	Steubenville Stemmed	21
	Susquehanna Broad	2
Total		**101**

As noted in the Middle Archaic discussion, the Brewerton complex may begin late in the Middle Archaic based on evidence from southern New York (Funk 1983, 1993). The type was initially considered a hallmark of the Archaic Laurentian Tradition but its distribution has been determined to be wider than that of the tradition (Knepper and Petraglia 1993:219). There are three Brewerton styles: Eared Notched, Side Notched, and Corner Notched.

The large collection of Brewerton points present in the Alum collections from Beaver County are illustrative of the differences observed in the Brewerton family of points. The Brewerton Side Notched form was discussed in the earlier Middle Archaic summary. The technical data for the Brewerton Corner and Eared Notched forms are presented on Table 3.72. The italicized and bolded cells indicate dimension measurements taken on fragmented elements.

Table 3.72. Study Collection Brewerton Corner Notched and Eared Notched Projectile Point Summary Data								
Type	**Site**	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Material**	**Appendix D Figure #**
Brewerton Corner Notched	36BV3	39.11	28.47	26.08	15.50	6.20	Chert, unidentified	D28
Brewerton Corner Notched	36BV3	48.67	39.57	28.55	19.62	6.84	Chert, Onondaga	D28
Brewerton Corner Notched	36BV10	34.45	26.69	20.15	19.80	7.40	Chert, Onondaga	D36
Brewerton Corner Notched	36BV10	38.39	27.30	24.09	18.01	7.57	Chert, unidentified	D36
Brewerton Corner Notched	36BV11	28.04	19.12	18.69	14.78	6.01	Chert, unidentified	D39
Brewerton Corner Notched	36BV11	30.15	22.16	19.99	14.63	6.56	Chert, unidentified	D39
Brewerton Corner Notched	36BV11	31.64	24.11	26.32	19.27	6.56	Chert, unidentified	D39
Brewerton Corner Notched	36BV11	33.34	27.30	19.96	12.77	5.63	Chert, unidentified	D39
Brewerton Corner Notched	36BV11	36.11	30.62	23.26	***16.95***	5.31	Chert, unidentified	D39
Brewerton Corner Notched	36BV13	***27.95***	***19.10***	25.21	20.71	7.94	Chert, unidentified	D42
Brewerton Corner Notched	36BV13	28.56	21.55	19.83	15.80	6.24	Chert, Onondaga	D42
Brewerton Corner Notched	36BV13	32.81	21.98	24.42	19.18	7.14	Chert, Onondaga	D42
Brewerton Corner Notched	36BV14	25.61	18.77	17.85	14.69	5.46	Chert, unidentified	D46
Brewerton Corner Notched	36BV14	28.84	22.41	22.79	16.12	4.93	Chert, Onondaga	D46
Brewerton Corner Notched	36BV14	41.57	36.95	29.04	18.19	7.37	Chert, unidentified	D46
Brewerton Corner Notched	36BV21	26.23	16.81	16.09	18.17	5.62	Chert, Onondaga	D48
Brewerton Corner Notched	36BV21	27.72	18.49	16.31	19.24	4.87	Chert, Onondaga	D48
Brewerton Corner Notched	36BV21	***27.78***	***21.57***	***22.85***	17.53	5.65	Chert, Onondaga	D48
Brewerton Corner Notched	36BV21	29.08	18.53	21.13	19.81	6.36	Chert, unidentified	D48
Brewerton Corner Notched	36BV21	29.79	23.11	17.24	16.84	5.46	Chert, Onondaga	D48
Brewerton Corner Notched	36BV21	30.96	23.20	26.84	16.23	6.05	Chert, Onondaga	D50
Brewerton Corner Notched	36BV21	33.81	23.46	22.97	17.75	8.12	Chert, Onondaga	D50
Brewerton Corner Notched	36BV21	33.97	28.53	24.48	15.65	6.14	Chert, Onondaga	D48

Table 3.72. Study Collection Brewerton Corner Notched and Eared Notched Projectile Point Summary Data								
Type	**Site**	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Material**	**Appendix D Figure #**
Brewerton Corner Notched	36BV21	***33.98***	***24.51***	24.48	16.11	6.43	Chert, Kanawha	D50
Brewerton Corner Notched	36BV21	34.01	26.08	24.31	16.55	7.65	Chert, unidentified	D49
Brewerton Corner Notched	36BV21	34.32	26.20	20.64	16.99	5.75	Chert, unidentified	D48
Brewerton Corner Notched	36BV21	34.91	25.93	24.63	17.98	7.89	Chert, Onondaga	D49
Brewerton Corner Notched	36BV21	35.64	25.82	24.60	16.99	6.98	Chert, Onondaga	D49
Brewerton Corner Notched	36BV21	35.86	26.09	20.65	15.35	7.09	Chert, Onondaga	D48
Brewerton Corner Notched	36BV21	39.42	31.24	29.15	***13.65***	7.31	Chert, Onondaga	D49
Brewerton Corner Notched	36BV21	39.75	29.12	23.79	17.96	6.30	Chert, unidentified	D49
Brewerton Corner Notched	36BV22	28.92	21.11	23.78	17.85	6.51	Chert, unidentified	D55
Brewerton Corner Notched	36BV22	31.17	24.92	22.54	14.65	8.38	Chert, unidentified	D55
Brewerton Corner Notched	36BV22	33.43	22.82	22.82	16.47	7.19	Chert, Onondaga	D55
Brewerton Corner Notched	36BV22	34.34	25.61	26.03	18.09	7.22	Chert, unidentified	D55
Brewerton Corner Notched	36BV22	36.92	28.53	25.55	15.36	7.05	Chert, Onondaga	D55
Brewerton Corner Notched	36BV22	40.99	31.79	33.18	23.03	7.48	Chert, unidentified	D55
Brewerton Corner Notched	36BV22	41.81	36.42	31.88	17.03	6.61	Chert, unidentified	D55
Brewerton Corner Notched	36BV24	33.31	28.99	28.91	18.75	7.88	Chert, unidentified	D60
Brewerton Corner Notched	36BV24	36.50	27.57	25.30	8.10	7.80	Chert, Onondaga	D60
Brewerton Corner Notched	36BV26	30.75	23.38	21.99	15.69	5.68	Chert, Onondaga	D67
Brewerton Eared Notched	36AL6	28.8	20.6	14.2	19.0	3.9	Chert, Onondaga	D2
Brewerton Eared Notched	36AL6	30.8	22.4	18.9	19.7	6.2	Chert, Onondaga	D2
Brewerton Eared Notched	36BV38	27.1		17.7		5.9	Chert, local pebble	D70
Brewerton Eared Notched	36BV38	31.68	23.71	16.61	19.41	6.76	Chert, Onondaga	D69

Two side notched Brewertons recovered from the Thorpe Site in western Pennsylvania exhibit the common asymmetrical notching to the hafting area (George 1998:10). The group of five Brewerton Side Notched points from Site 36BV292 (the Connoquenessing Site) had all been reworked and Petraglia et al. (1992b:237) suggest that the points may actually have been "scavenged for use during a later period". The points were manufactured of Delaware, Onondaga, and Zaleski cherts. At the Saddle Site (46MR95), 11 Brewerton points were recovered. Included in that sample were nine side notched varieties and two eared notched. All but one of the side notched varieties exhibited basal grinding though this preparation was all but absent from the eared notched specimens. Of the 11 points in the grouping, five were manufactured of Hughes River chert; five, including both eared notched items, were Upper Mercer chert, and one was made on local pebble chert (Church and McDaniel 1992:40).

Broadspears have been recovered but do not seem to be prevalent. Petraglia et al. (1992b:237) note a broadspear fragment from the Connoquenessing Site (36BV292) manufactured on Onondaga chert. They note, however, that the artifact's width (26 mm [1 in]) and thickness (6mm [0.2 in]) might be more indicative of a later Raccoon Notched point. Broadspears are listed as occurring at only one site in the PASS Subbasin 20 database (Site 36ME86). Several broadspear varieties were identified in the study collections.

Table 3.73 presents the metric and raw material data for the Koens-Crispin Broad and the Susquehanna Broad; Snook Kill points were also recovered and they are discussed later in this section. The Koens-Crispin Broad is classified by Justice (1987:159-163) as within the Genesee Cluster (Justice 1987:159-163) and it is related to the Snook Kill point. The Susquehanna Broad is closely related to the Ashtabula type and they are likely variants of the same broad-blade theme (Justice 1987:167). The italicized and bolded measurements indicate the artifact was re-sharpened.

Table 3.73. Study Collection Koens-Crispin Broad and Susquehanna Broad Projectile Point Summary Data

Type	Site	Object Length	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Material	Appendix D Figure #
Koens-Crispin Broad	36AL19	103.69	80.07	52.48	19.93	7.80	Rhyolite	D4
Susquehanna Broad	36BV24	33.16	24.03	16.58	15.94	6.11	Chert, unidentified	D60
Susquehanna Broad	36BV24	***41.84***	***29.72***	23.67	13.94	5.42	Chert, unidentified	D60

Lamoka points were defined initially in New York and are diagnostic of the Late Archaic in that state (Ritchie 1971, 1980). The type is more common outside of the study area than in it but it does occur with some frequency. In the PASS Subbasin 20 database, there are no Lamoka entries. However, two examples of the type were recovered at the Saddle Site (46MR95). One was manufactured of Hughes River chert and the other of local pebble chert.

In the study collections (Table 3.74), four definite examples were identified. A fifth, from Site 36AL124, is classified as a Lamoka-like point that may have been re-sharpened. It is listed herein for reference; no metric data was taken on it because the re-sharpening was extensive. James Herbstritt (personal communication 2001) noted that it also might be categorized as a Manker Stemmed and it might have been heat treated. The four definite Lamoka points are all manufactured on Onondaga chert. The Lamoka-like example is manufactured on a 10YR4/2 dark yellowish brown unidentified chert. The piece retained some weathered cortex that did not appear to be stream worn.

Table 3.74. Study Collection Lamoka and Lamoka-Like Projectile Point Summary Data

Type	Site	Object Length	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Material	Appendix D Figure #
Lamoka	36BV10	33.15	21.50	14.49	14.52	7.23	Chert, Onondaga	D36
Lamoka	36BV10	37.94	25.55	15.41	12.01	7.71	Chert, Onondaga	D36
Lamoka	36BV14	33.50	22.53	20.31	12.35	10.49	Chert, Onondaga	D46
Lamoka	36BV14	39.76	28.35	21.19	12.35	10.02	Chert, Onondaga	D46
Lamoka-like, possibly resharpened	36AL124	No metrics taken on the object because of condition.					Chert, unidentified	D24

Late Archaic Side Notched, Late Archaic Stemmed, and Late Archaic Stemmed Cluster points (Table 3.75) are grouped in a generalized category of relatively wide-stemmed and narrow bladed varietals. In the study collection, examples were recovered from a small number of the sites (36AL480, 36BV3, 36BV22, and 36BV26). The italicized and bolded measurements were taken on a fragmented piece. Justice (1987) assigns the Late Archaic Stemmed Cluster to the lower Ohio Valley, centered in southern Illinois, northwestern Kentucky, and eastern Missouri. However, points easily assignable to the cluster occur up through the middle and upper Ohio River valley (George personal communication 2001).

Table 3.75. Study Collection Late Archaic Stemmed Cluster – Like Projectile Point Summary Data

Type	Site	Object Length	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Chert Type	Appendix D Figure #
Side Notched	36AL480	34.00					unidentified	D26
Stemmed	36BV3	31.28	21.38	16.03	12.40	7.46	unidentified	D30
Stemmed	36BV3	44.08	28.92	21.17	16.00	11.71	Onondaga	D30
Stemmed	36BV22	32.11	23.04	19.99	16.82	7.01	Onondaga	D56
Stemmed	36BV22	35.75	29.23	21.68	17.09	6.23	Onondaga	D56
Stemmed	36BV22	39.68	31.75	19.78	17.43	7.14	Onondaga	D56

Table 3.75. Study Collection Late Archaic Stemmed Cluster – Like Projectile Point Summary Data (cont.)								
Type	**Site**	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Chert Type**	**Appendix D Figure #**
Stemmed	36BV22	39.92	30.65	20.28	14.91	8.47	unidentified	D56
Stemmed	36BV22	41.48	31.33	24.90	15.05	7.43	Onondaga	D56
Stemmed	36BV22	42.61	35.21	23.67	14.24	8.22	unidentified	D56
Stemmed	36BV26	35.05		23.68	17.74	10.00	Onondaga	D67
Stemmed	36BV26	35.29	22.75	18.05	13.48	7.93	Onondaga	D67
Stemmed	36BV26	37.97	28.05	23.58	13.44	7.61	Onondaga	D67
Stemmed	36BV26	50.18	37.85	21.48	14.92	7.50	unidentified	D67
Stemmed Cluster	36BV3	35.29	27.36	20.70	12.60	7.27	unidentified	D28
Stemmed Cluster	36BV3	40.99	33.65	21.70	12.31	7.82	Kanawha	D28
Stemmed Cluster	36BV3	42.57	35.74	21.42	15.31	8.96	unidentified	D28

The minor, Late Archaic types identified in the study collections included Merom / Trimble, Normanskill-like, Poplar Island, and Snook Kill (Table 3.76). Merom / Trimble points, members of the Merom Cluster (Justice 1987:130-132), were originally defined as hallmarks of the Riverton culture in western Indiana and southern Illinois. The types, however, have a much broader distribution than that illustrated by Justice (1987:132, Map 56) and the type is confirmed as present through southern Ohio and northern West Virginia along the Ohio River valley. Normanskill points are part of the Lamoka Cluster and were originally defined in New York as a Laurentian Tradition hallmark (Ritchie 1980). Poplar Island points are assigned to the late Late Archaic and continue into the Terminal Archaic. Justice (1980) noted their appearance as late as the Early Woodland. The Snook Kill type is Late Archaic and was originally defined in New York (Ritchie 1980). The type is common throughout New York and Pennsylvania. Of the complete examples in the study collection, one is short (length = 40.71mm) and the others fall just within the type length range (50.8-111.8 mm). The pieces with the bolded and italicized measurements were re-sharpened.

Table 3.76. Study Collection Merom/Trimble, Normanskill-like, Poplar Island, and Snook Kill Projectile Point Summary Data								
Type	**Site**	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Chert Type**	**Appendix D Figure #**
Merom/ Trimble	36AL480	27.20					unidentified	
Normanskil – like	36AL124						unidentified	
Poplar Island	36BV10	60.12	46.74	31.07	14.21	7.96	Onondaga	D36
Snook Kill	36BV11	54.84	44.31	38.29	17.71	9.00	unidentified	D39
Snook Kill	36BV13	***25.34***	***20.76***	***22.30***	10.61	9.40	unidentified	D42
Snook Kill	36BV13	40.71	29.95	32.90	11.34	9.64	Onondaga	D42
Snook Kill	36BV13	50.20	34.36	36.58	15.81	9.15	unidentified	D42
Snook Kill	36BV38	***49.79***	***41.81***	32.48	14.46	9.55	unidentified	D69

Steubenville Stemmed points occur with some regularity at Late Archaic sites in the region. The PASS (Subbasin 20) database contains reference to 26 examples recovered from the following site types: open habitation, village, rockshelter, isolated find, unknown function (both less than and greater than 20 m (66 ft) radius). The study collection sample (n=24; Table 3.77) was restricted to only two of the sample sites (36AL6 and 36BV22). On Table 3.77, italicized and bolded measurements were taken on re-sharpened or fragmented pieces. For the Steubenville Lanceolate examples, the Object and Blade lengths are the same and the type has no stem.

Table 3.77. Study Collection Steubenville Projectile Point Summary Data

Type	Site	Object Length (OL)	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Chert Type	Appendix D Figure #
Lanceolate	36BV22	49.73		23.71		6.03	unidentified	D57
Lanceolate	36BV22	52.10		13.51		7.30	unidentified	D57
Lanceolate (?)	36BV22	44.60		24.12		6.22	unidentified	D57
Stemmed	36AL6	45.8	30.1	26.3	21.1	6.2	Onondaga	D1
Stemmed	36AL6	49.2	36.9	23.0	19.8	9.3	Three Mile Creek	D1
Stemmed	36AL6	52.6	39.2	26.7	22.4	7.3	unidentified	D1
Stemmed	36AL6	65.3	51.0	28.7		9.3	Onondaga	D1
Stemmed, fragment	36AL6			34.7	27.7	7.0	Onondaga	D1
Stemmed	36BV22	35.89	26.82	21.58	17.17	7.47	unidentified	D57
Stemmed	36BV22	39.07	29.65	24.38	20.00	6.30	unidentified	D57
Stemmed	36BV22	***39.39***	***25.06***	28.64	22.85	6.70	unidentified	D57
Stemmed	36BV22	39.90	25.93	25.40	21.34	7.15	unidentified	D57
Stemmed	36BV22	40.49	31.06	25.17	***21.04***	6.11	unidentified	D57
Stemmed	36BV22	41.16	27.39	22.94	20.86	6.99	unidentified	D57
Stemmed	36BV22	41.82	32.35	23.26	16.28	7.25	unidentified	D57
Stemmed	36BV22	41.85	31.62	24.24	20.17	5.93	unidentified	D57
Stemmed	36BV22	***45.15***	***60.00***	33.18	21.27	7.67	unidentified	D57
Stemmed	36BV22	46.00	36.03	21.96	19.39	6.58	unidentified	D57
Stemmed	36BV22	***47.47***	***32.06***	29.31	21.81	6.06	unidentified	D57
Stemmed	36BV22	48.19	35.39	27.63	18.52	8.25	unidentified	D57
Stemmed	36BV22	50.31	38.22	27.67	21.77	7.02	unidentified	D57
Stemmed	36BV38	46.30	33.94	23.04	16.75	7.54	Onondaga	D69
Stemmed	36BV38	48.45	39.24	26.57	17.41	7.29	Onondaga	D69
Stemmed?	36BV22	39.59	28.72	24.64	18.13	8.02	unidentified	D57

George (1998:10) notes that 16 percent of the Steubenville points in a sample of 62 that he examined displayed "slightly contracting stems" and the 95 percent of the examined sample did not have basal grinding on their incurvate bases. The lack of the basal grinding departs from the type's typical configuration as Steubenville points commonly exhibit this characteristic. East et al. (1996), reporting on Scenery Hill 1 (36AL375) classified the seven

projectile points recovered during the Phase III data recovery investigations as Steubenville Stemmed or Steubenville Lanceolate forms. Mayer-Oaks (1955) considered these point types to be diagnostic of his Panhandle Archaic phase. Based on the small comparative sample, East et al. (1996:102) assigned the type to the Late Archaic/Terminal Archaic.

Other Artifact Classes

The suite of non-chipped stone artifacts assignable to the Late Archaic includes bone and shell tools, ground stone, and pecked stone. Mayer-Oakes (1955) presents a detailed outline of the typical Archaic grouping of these tool types but he does not separate out items indicative of particular Archaic periods. He does illustrate a suite of tools for the Panhandle Archaic and these include bone awls and points, an antler point, bannerstones, and ¾ grooved adzes. The latter have pointed polls (Mayer-Oakes 1955). Interestingly, none of these non-chipped stone hallmarks were recovered from the Scenery Hill 1 Site (36AL375) which represents one of the few Panhandle Archaic sites excavated outside of the this phase's West Virginia heartland.

The most detailed presentations for Late Archaic non-chipped stone tool assemblages are those developed by Ritchie (1980) and Kraft (1972) for Southern Tier New York and the Delaware drainage, respectively, and by Adovasio et al. (1982) for the Paintsville Reservoir just outside of the study region to the southwest. In the Late Archaic, and continuing into the Terminal Archaic and Early Woodland as well, there appears to be an explosion of ground and pecked stone forms. This may be an outgrowth of the Laurentian Tradition or it may be in response to a pattern of broad-spectrum resource utilization. What is known is that specialized tool forms, such as full-grooved (Brewerton phase) and ¾-grooved axes (Brewerton phase, Delaware River Archaic), appear in quantity. Formed and expedient netsinkers also appear as do quantities of fire-cracked boiling stones (Ritchie 1980; Kraft 1973). The latter will occur in feature form as platforms (Weed and Wenstrom 1992).

An examination of Ritchie (1980), Kraft (1972), nad Adovasio et al. (1982) lends more specificity to the discussion. Ritchie (1980:99-104) notes the presence of various ground stone, bone and antler tools on Middle and Late Archaic Brewerton phase sites. The assemblage includes notched netsinkers, copper gorges, barbed bone points, and double-pointed bone implements which he calls leister points though leister points traditionally have three prongs. Also included among the ground stone objects are cylindrical and conical pestles, mortars, and mullers.

Kraft (1972:336-337), in defining his Delaware Valley Archaic complex, assigns several ground stone types to both Late Archaic and Terminal Archaic contexts. The ground stone assemblage includes mullers, bannerstones (including bi-pinnate and tie-on forms), celts, and ¾ grooved axes.

Adovasio et al. (1982), for Paintsville Reservoir, and Vento et al. (1980), for Dameron Rockshelter (Site 15JO23A) within the Paintsville Reservoir study area, detail the ground stone and bone tools recovered from Late Archaic contexts. What is perhaps most notable about the assemblages are their non-descript nature. The ground stone includes

pitted stones, mortars, discoidals, pestles, and mullers. The bone tools include both scrapers and awls.

Research Issues – Late Archaic

A series of research questions for the Late Archaic and based on the PASS (Subbasin 20) and study collection data alone are presented below. The research questions are focused on three areas: settlement systems, subsistence patterns, and artifact assemblage.

Unlike the previous two Archaic periods, there appears to have been only minimal attention paid to developing a site settlement model for the Late Archaic period. Caldwell's (1958) foraging model is applicable, but the data suggests that Stewart and Cavallo's (1991) Middle Archaic model might be applicable to the Late Archaic as well. As was the case for the Middle Archaic, by using the PASS UTM and site-size data, the usefulness of these models in defining a Late Archaic settlement model can be tested. Research avenues pertinent to this issue and settlement strategies in general are listed below.

- Caldwell's (1958) model of Archaic site distribution and Stewart and Cavallo's (1991) model of Middle Archaic site distribution both may be applicable to Late Archaic settlement in the study region. Does an examination of the PASS (Subbasin 20) site-specific locational and site-size data support the applicability of these models to the area?

- Would a re-examination of the PASS (Subbasin 20) site type data, reclassifying the sites based on size and assemblage characteristics, result in an appreciably different picture of site settlement strategies in the area than is generated by the current, broad categories?

- Subsistence data for the Late Archaic in the study area is not plentiful. The recovered floral and faunal specimens indicate that exploitation patterns were much the same as for preceding periods. If this is the case, then the paramount questions concerning subsistence should focus on any changes in subsistence approaches from those of preceding periods. Research questions relevant to this issue are listed below.
- Feature configuration at Late Archaic sites does not appreciably differ from those of preceding periods though the data sets are small. Does this suggest that food preparation and storage was unchanged from earlier periods?

- It is hypothesized that certain species such as chenopodium and amaranth might represent so-called semi-domesticates and that the appearance of these species in Late Archaic contexts herald cultural receptiveness to horticulture. These species are not prevalent, however, in the limited number of Late Archaic floral assemblages documented to date in the study area. Did other species in the study area serve the same hypothesized role? If yes, what species were selected?

The study collection data for the Middle Archaic suggested that Middle Archaic projectile points were smaller in the study area than in other regions because of raw material

restrictions. However, this possible pattern does not appear to continue in the Late Archaic, though there is no definitive difference in the types of raw materials being used for chipped stone tool manufacture. Possible research questions focused on this issue are presented below.

- Are chipped stone raw material sources being used that were not exploited during the preceding Archaic periods? If yes, which sources are they?

- Although the Late Archaic study collection specimens fit the size ranges for the types, is this standard for other Late Archaic projectile points in the study region?

Terminal Archaic (overlap, 1250 B.C. – 750 B.C)

In the PASS (Subbasin 20) and Ohio (Leetsdale) sample, there were 43 Terminal Archaic components defined. Of this total, 12 sites are located within 100 m of a permanent river (Table 3.78). These 12, based on diagnostic projectile points in their collections date either to the Terminal Archaic or to the Terminal Archaic, Early Woodland continuum. As noted earlier in the Late Archaic summary (Table 3.69), an additional 15 sites had diagnostic projectile points which are known to occur in both the Late Archaic and Terminal Archaic periods. The projectile point styles that overlap from Late Archaic to Terminal Archaic are the broadspears while the Late Archaic to Early Woodland continuum is defined by the presence of Perkiomen projectile points. While ceramics do occur in the Terminal Archaic in the greater study region, Terminal Archaic types like fiber tempered and Marcey Creek steatite tempered never occur in quantity at any site in Subbasin 20. Overall, there is an obvious continuum from Late Archaic into Early Woodland based on projectile point distributions alone. In the following sections, the implications of the continuum are discussed.

Table 3.78. PASS (Subbasin 20) Terminal Archaic Components Within 100 M of Permanent River

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36AL480	Open habitation	G	Ohio River	0	Ohio River	0	Floodplain and terraces	Terminal Archaic (fieldwork and collection examination)
36BT50	Open unknown function	C	Ohio River	80	Beaver River	120	Terrace	Terminal Archaic
36BT78	Open habitation	C	Ohio River	20	Beaver River	220	Lower Slopes	Terminal Archaic
36BT162	Open unknown function	C	Ohio River	20	Beaver River	500	Hill Ridge/ Toe	Terminal Archaic
36BT198	Open unknown function	C	Ohio River	10	Beaver River	240	Floodplain	Terminal Archaic
36BV22	Open habitation	D	Ohio River	0	Raccoon Creek	290	Terrace	Terminal Archaic, Early Woodland (collection examination)
36BV197	Open habitation	B	Ohio River	50	Beaver River	160	Terrace	Terminal Archaic, Early Woodland

Table 3.78. PASS (Subbasin 20) Terminal Archaic Components Within 100 M of Permanent River (continued)

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36CW340	Open surface scatter <20m radius	A	Shenango River	0	Neshannock River	0	Not completed	Terminal Archaic
36CW367	Open habitation	A	Shenango River	60	Neshannock River	220	Hill Ridge/ Toe	Terminal Archaic
36ME23	Open surface scatter <20m radius	A	Shenango River	80	Neshannock River	100	Terrace	Terminal Archaic
36WH274	Village (Including Historic Indian)	F	Ohio River	0	Chartiers Creek	80	Terrace	Terminal Archaic, Early Woodland
36WH1195	Open unknown function	F	Ohio River	60	Other	100	Lower Slopes	Terminal Archaic

Cultural Chronology

The beginning and end dates for a Terminal Archaic construct in the region are nebulous at best. The dates chosen above are an amalgam of the Kraft (1972) and Ritchie (1980) dates for terminal or transitional Archaic expressions in the Delaware River valley and New York. As noted below, the Terminal Archaic dates in the region do not afford a clear picture of the period's time range. Thus, the amalgam dates represent a conservative estimate based on regional events.

Dates assigned to the Terminal Archaic and the Terminal Archaic/Early Woodland in Subbasin 20 literature include radiocarbon assays obtained at 36AL375 (Scenery Hill 1), 36AL480, 36BV292 (Connoquenessing Site), 36LR11 (Chambers Mound), and 36WH297 (Meadowcroft Rockshelter) (Appendix I). This suite of dates ranges between 3640 B.C. (36WH297, Sample SI-1685) to 1190 B.C. (36AL480, Sample Beta 141373).

With two exceptions, all of the so-called Terminal Archaic dates overlap those of the Late Archaic period. This overlap emphasizes the ill-defined transition between these two periods. The situation is no less defined for the Terminal Archaic and Early Woodland transition. In this case, the Terminal Archaic/Early Woodland components in the data suite presented in Appendix I predate the recognized onset of the Early Woodland by almost 200 years.

Based on the literature, it appears that the chronological problems are directly linked to a lack of definitive hallmarks for the period and a small suite of dates upon which to base interpretations. The work completed at 36AL480 between 2001 and 2003 has addressed these two issues and the results are discussed in later chapters.

Site Settlement Patterns

The PASS (Subbasin 20) site distribution data (Table 3.79) were used to determine if site setting preferences differed between the Late Archaic, Terminal Archaic, and Early Woodland. The temporal assignments, as elsewhere in this discussion, were based on the diagnostic projectile points. As regards the Early Woodland, only the sites that shared common projectile point types with Terminal Archaic were considered.

Based on the resultant data (Table 3.79), there does not appear to be a difference in preferred settings between the three time periods, though Terminal Archaic sites do appear in Hill Ridge/Toe settings and Late Archaic do not; this difference, however, is considered insignificant.

Table 3.79. PASS (Subbasin 20) Summary of Late Archaic, Terminal Archaic, and Early Woodland Landform and Topographic Setting by Period

Landform	**Topographic Setting**	**Period**	**N=**	**% of Base N=**
Lowland	Floodplain	Late and Terminal Archaic Late Archaic Terminal Archaic	3 3 1	
	Floodplain and terraces	Late Archaic Terminal Archaic	1 1	
	Rise on floodplain	Late Archaic	1	
	Terrace	Late and Terminal Archaic	4	
		Late Archaic	5	
		Terminal Archaic	2	
		Terminal Archaic, Early Woodland	3	
Lowland N=			**24**	**51.1**
Upland	Hill Ridge/ Toe	Terminal Archaic	2	
	Hilltop	Late Archaic	1	
	Lower Slopes	Late and Terminal Archaic Late Archaic Terminal Archaic	1 2 2	
	Middle Slopes	Late and Terminal Archaic	1	
		Late Archaic	2	
	Ridgetop	Late and Terminal Archaic	2	
	Saddle	Late and Terminal Archaic	2	
	Stream Bench	Late and Terminal Archaic Late Archaic	2 5	
	Upland Flat	Late Archaic	1	
Upland N=			**23**	**48.9**
Grand N=			**47**	**100.0**

The PASS (Subbasin 20) data also were examined for associations between landform and topographic setting by period and associated projectile point styles (Table 3.80). Because of the overlap of temporally distinct markers between the three periods in the study area, there is no way to discern whether the sites in the sample are Late Archaic, Terminal Archaic, or Early Woodland based solely on the projectile points in the suite below. Of interest in this examination by landform, however, is the overwhelming presence of this suite of sites in lowland settings.

Table 3.80. PASS (Subbasin 20) Co-period Projectile Points by Landform and Topographic Setting

Landform	Topographic Setting	Co-Periods	Associated Projectile Points	N=	% of Base N=
Lowland	Floodplain	Late Archaic, Terminal Archaic	Susquehanna; Broadspears	1	
		Terminal Archaic, Early Woodland	Perkiomen	1	
	Rise in Floodplain	Late Archaic, Terminal Archaic	Susquehanna	2	
		Terminal Archaic, Early Woodland	Perkiomen	1	
	Terrace	Late Archaic, Terminal Archaic	Susquehanna	4	
		Terminal Archaic	Orient Fishtail	1	
			Orient/Dry Brook Fishtail	1	
		Terminal Archaic, Early Woodland	Perkiomen	3	
Lowland N=				**14**	**87.5**
Unknown	Not completed	Late Archaic, Terminal Archaic	Susquehanna	1	
Unknown N=				**1**	**6.25**
Upland	Hilltop	Terminal Archaic, Early Woodland	Perkiomen	1	
Upland N=				**1**	**6.25**
Grand N=				**16**	**100.0**

As noted for the Late Archaic period, the dispersion of sites across the landscape does appear to be patterned. In the case of the Terminal Archaic components, there seems to be a decided preference for siting in the lowlands. Because of the small number of sites in the PASS (Subbasin 20) data set, however, the pattern cannot be confirmed.

Equally ill-defined are either house or feature types that are clearly assignable only to the Terminal Archaic. Of the study group of sites, no sites had house features. Further, only features at Scenery Hill 1 (36AL375) were assigned to Terminal Archaic. These features included amorphous, ovoid, circular, and slab-lined basins; rock concentrations; and a rock-filled cylinder (East et al. 1996). All of the features had been truncated by plowing. Therefore, they were extremely hard to define at the plowzone/B horizon interface, and were not definable until encountered as concentrations of rock fragments or carbonized organics in the subsoil (East et al. 1996:110). East et al. (1996:124), considering the features and associated artifact assemblage, interpret the occupation at the site as the remnants of a base camp with defined activity areas for both Late Archaic and Terminal Archaic. They also note that outlying artifact concentrations to the main concentration may represent "additional short-duration, ephemeral occupations, or localized activity areas" (East et al. 1996:124).

Subsistence and Seasonality Studies

Floral and faunal assemblages directly attributable to the Terminal Archaic in the study area are uncommon. In the near vicinity, Coppock (1998:97) notes that the single Terminal Archaic feature at Site 36SO220 yielded nutshell, raspberry/blackberry, sumac, bedstraw, and plum seeds. At Scenery Hill 1, both hickory and black walnut were recovered from pit features (East et al. 1996). The implications of these botanical remains as regards to seasonality are discussed only on a general level by the authors and in each case the feature contents are interpreted as late summer / early fall residues.

Artifact Assemblages and Lithic Technologies

As with earlier Archaic periods, the Terminal Archaic artifact assemblages defined to date are comprised primarily of chipped, ground, and pecked stone objects. Some shell, bone, and antler recovery also has occurred but the occurrence of these artifact classes is low. Unlike Terminal Archaic assemblages recovered from sites further to the east or even in New York, there is little steatite present in the assemblages. Nine steatite pieces, representing no more than two vessel fragments, were recovered from Site 36AL480 (Vento 2004). No confirmed fiber tempered or steatite tempered ceramics were identified in the study collections though the presence of both ceramic wares are known from the Allegheny Plateau in general.

Chipped Stone

The Terminal Archaic projectile point assemblage is comprised of projectile point types which began to be manufactured in the Late Archaic and types which will continue to be manufactured into the Early Woodland (Table 3.81). The Late Archaic grouping, discussed in the earlier section, includes: Koens-Crispin Broad, Snook Kill, Steubenville Lanceolate and Stemmed, and Susquehanna Broad. Four styles first appear during Terminal Archaic and each continues to be made into Early Woodland times. These include Bare Island, Dry Brook Fishtail, Orient Fishtail, and Perkiomen. None of these latter types seem to occur in appreciable numbers in the UOV though their incidence increases appreciably as one moves east across the Appalachian Plateau toward the Susquehanna and Delaware river drainages.

Table 3.81. Study Collection Terminal Archaic Projectile Point Types

Period	Type	Total
Late Archaic, Terminal Archaic	Koens-Crispin Broad	1
	Snook Kill	5
	Steubenville Lanceolate and Lanceolate-like	3
	Steubenville Stemmed	21
	Susquehanna Broad	2
Terminal Archaic, Early Woodland	Orient Fishtail	1
	Orient / Dry Brook Fishtail	1

Dry Brook and Orient fishtails were both defined in the Delaware River Valley (Kraft 1972:430-433) and are present into New England, through the Mid-Atlantic, and into western Pennsylvania (Table 3.82). The types are both assigned to the Late Archaic to Early Woodland Fishtail Tradition which is marked in the Delaware Valley by the co-occurrence of fishtails, soapstone bowl, Marcey Creek ceramics, Vinette 1 grit-tempered pottery, and Interior/Exterior Cordmarked pottery. The two examples in the study collection include a jasper specimen which is one of the common materials used in the Delaware River Valley for the manufacture of the type.

Table 3.82. Study Collection Fishtail Projectile Point Summary Data

Type	Site	Object Length	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Material	Appendix D Figure #
Orient Fishtail	36BV13	44.03	30.96	18.62	11.72	6.52	Chert, Onondaga	D42
Orient/Dry Brook Fishtail	36BV22	44.63	29.57	19.03	14.03	5.93	Jasper	D58

Perkiomen points are noted in the PASS (Subbasin 20) database, but did not occur in any of the study collections.

Other Artifact Classes

Recognized hallmarks of the Terminal Archaic in the Appalachian Plateau and Mid-Atlantic regions include ceramics (fiber tempered, steatite tempered Marcey Creek, and sand tempered Thom's Creek), steatite bowls, and stone bowls.

Unlike other areas of the Appalachian Plateau, in particular to the south, the UOV does not seem to host significant evidence of either Marcey Creek or Marcey Creek-like steatite-tempered pottery or variations on the Thom's Creek sand-tempered series (Sassaman 1993). Thom's Creek, common to the Mid-Atlantic region is usually found in contexts post-dating Marcey Creek levels and is, in the Mid-Atlantic, assigned to the terminal Late Archaic and Early Woodland.

Although occasional reference is made to fiber-tempered ceramics (Davis 1998) in the region, the identification is more descriptive than temporal. The early ceramic series in the region, Fayette Thick, is not comparable to Vinette 1 which is the Fishtail Tradition hallmark associated with Fishtail points. In turn, Fayette Thick is a true Early Woodland manifestation and it does not appear until the onset of that period.

The presence of steatite in raw or manufactured form is not common in the study basin. There is no steatite listed in the PASS (Subbasin 20) database. Vento (2004) reports on fragments of two steatite bowl from Areas 2 and 3 at 36AL480. Mayer-Oakes (1955) illustrates examples from his UOV study region. At Site 36SO220, Coppock (1998:97) reports pieces of steatite which he assigns to the Terminal Archaic component at the site. It should be noted here, however, that George (personal communication 2001) notes the use of steatite for plummets in the Early Woodland and Middle Woodland in the area. Thus, steatite presence in the region spans several time periods.

Research Issues – Terminal Archaic

At this juncture, the single research issue for this period is, What are its hallmark characteristics? The suite of artifacts considered typical of the Terminal Archaic elsewhere in the Appalachian Plateau region do not exist as an identifiable entity in the study region. Therefore, the development of the trait list for the period, supported by radiocarbon assays, is critical to supporting an argument that the temporal construct should be used at all in the area. Research avenues pertinent to this issue are listed below.

- Terminal Archaic sites do not appear to be sited in settings which differ from those utilized during the preceding Late Archaic or the subsequent Early Woodland. Do Terminal Archaic sites occupy any niche not previously exploited? If such a niche exists, is it used exclusively in the Terminal Archaic?

- Terminal Archaic radiocarbon dates consistently overlap the dates of the earlier and later periods. In the absence of defined beginning and ending markers for the period, should it be distinguished as a period at all in the region?

- Terminal Archaic sites cannot be distinguished as such on the basis of artifacts alone. Terminal Archaic hallmarks defined outside of the study area are found only in small numbers, if at all, within the study area. In the virtual absence of hallmarks such as steatite and other stone bowls and Marcey Creek steatite tempered ceramics, for example, what artifacts should be used as Terminal Archaic indicators?

- In other areas of the Appalachian Plateau in New York, Pennsylvania, and West Virginia, the Terminal Archaic period is distinguished by definable suites of artifacts and site layouts. What reasons could be posited for the lack of such a defined transition in the study area?

Early Woodland (1000 B.C. – A.D. 100)

The Early Woodland period is marked by two significant additions to the cultural milieu: widespread use of ceramics and the introduction of mound architecture. While ceramics began to appear in the Terminal Archaic, their widespread use did not occur until Early Woodland times. Even at this period, however, some Early Woodland sites (for example, the Thorpe Site [36AL285]) do not have ceramics and the artifact type appears to be restricted to specific site types including hamlets, seasonal camps, and villages. Mound architecture, introduced via the Adena cultural incursion into the southern reaches of the study area, is not widespread. Mounds as a mortuary element increase in numbers going downstream along the Ohio River and are more common in Ohio and West Virginia at this period than in Pennsylvania. In the following section, these and other elements of the Early Woodland are explored further.

Cultural Chronology

Mayer-Oakes (1955:8) and Cowin (1985) both assign the Early Woodland to the period from 1000 B.C. to 100 B.C. Some radiocarbon dates suggest that the period should be extended at least as late as A.D. 100 (Appendix I). Both the available dates and the diagnostic hallmarks of the period are discussed below.

In general, the absolute dates bracket the Early Woodland between about 3030 and 1900 B.P. (1290 B.C. to A.D. 100; Appendix I). Dated Early Woodland components at sites such as Boarts (36LR36), Georgetown (36BV29), Lock No. 3 (36AL2), Mayview Depot (36AL124), Mayview Bend (36AL125), Meadowcroft (36WH297), Ohioview (36BV9), and Thorpe (36AL285) all fall within this range. At the Thorpe Site (36AL285), the single radiocarbon date (1900±60 B.P. [A.D. 50; Beta-33947]; Appendix I) is considered by George (1998:23) to be acceptable. His acceptance of the date supports the contention that the end date for the period should be extended to A.D. 100. The date was obtained on materials not in direct association with the suite of Forest Notched points recovered from the site.

The artifact hallmarks for the period include projectile points, a knife form, and, for the first time, ceramics. The chipped stone tools include Adena Stemmed and Adena knives, Cresap Stemmed, Forest Notched, and contracting stem points. These are discussed below as are Adena Plain, Fayette Thick, Half Moon Cordmarked, and McKees Rock Plain ceramics.

Site Settlement Patterns

In the northern reaches of the study region, including southern New York and central and eastern Pennsylvania, Early Woodland Meadowood and Middlesex phase sites are present. Both of these phases are important, not because of their influence upon the study area but because they are the result of Adena trade contacts and, in the case of Middlesex, actual populations moving through the study area.

The Meadowood phase, defined by Ritchie (1980) initially as the Point Peninsula 1 Focus of the Early Woodland, is present in north, west, and central New York, though its hallmark projectile point, a Meadowood point, occurs throughout New York. The Meadowood culture is marked by true cemeteries comprised of multiple burials located away from habitation loci. Other site types defined include habitation and specialized work stations. Meadowood cultural ties appear to be to the west, and the artifact assemblage for the culture contains copper tools, striped slate gorgets and birdstones, and Wyandotte [Harrison County] chert cache blades. In addition, Vinette 1 pottery, the side-notched Meadowood points, and a suite of ground and pecked stone artifacts mark Meadowood habitation sites.

The Middlesex phase remains defined primarily as a mortuary complex linked with Adena. Ritchie (1980) originally believed that Middlesex manifestations represented an Adena ceremonial overlay onto the indigenous culture base. By the 1960s, however, researchers including Ritchie (1980) had concluded that actual resident Adena populations had moved into eastern New York, Pennsylvania, Delaware, and New Jersey where they

mingled with resident populations. Middlesex phase artifacts are illustrative of the close ties that were maintained with the Adena Ohio Valley heartland, and recovered types have included artifacts manufactured of Ohio pipestone and Ohio Flint Ridge chert, Wyandotte (Harrison County) chert, and Ohio banded slate (Ritchie 1980:202). As was the case with Meadowood, Middlesex sites have yielded classic turkey tail cache blades in addition to the smaller teardrop blades; blocked-end tubular pipes; copper objects, including celts and awls; gorgets; and birdstones (Ritchie 1980:202).

Middlesex and Meadowood sites, as such, exist only on the peripheries of the study area. The Adena artifact types which mark both phases are present in the study area, however, as are elements affiliated with the indigenous Terminal Archaic/Early Woodland population. The presence of a cohesive core population apparently did not restrict movement of Adena-linked traits through the study region. It is postulated Dragoo (1963), George (1998), and Ritchie (1980) that Adena traits were passed up the Allegheny drainage to New York and up the Monongahela east toward Maryland and the Mid-Atlantic region. In the latter case, Adena bands may actually have moved, also.

Based on the PASS (Subbasin 20) data, most of the Early Woodland sites and components assigned to a functional type seem to be open lithic scatters. Stratified floodplain and terrace sites, like Site 36AL480, are included in this suite. The other major site types are the mounds and earthworks documented throughout all portions of the study area, but slightly more common in Ohio and West Virginia than in Pennsylvania (Dragoo 1963). As noted on Table 3.83, the 54 Early Woodland sites within 100 m of a permanent river include the full array of regional site types: earthworks and burial mounds, isolated finds, open habitation (scatters of various sizes), rockshelters/caves, and villages.

Table 3.83. PASS (Subbasin 20) Early Woodland Components Within 100 M of Permanent River

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36AL6	Earthworks	F	Ohio River	60	Chartiers Creek	520	Rise on floodplain	Early Woodland (based on PASS and collections examination)
36AL62	Village including Historic Indian	F	Ohio River	80	Chartiers Creek	360	Hill ridge/toe	Early Woodland
36AL65	Open habitation	F	Ohio River	90	Chartiers Creek	520	Floodplain	Early Woodland
36AL245	Open habitation	G	Ohio River	80	Sewickley Creek	110	Hill Ridge/ Toe	Early Woodland
36AL252	Open habitation	A	Allegheny River	0	Not completed	350	Stream Bench	Early Woodland
36AL321	Open unknown function	F	Ohio River	25	Chartiers Creek	250	Terrace	Early Woodland

Table 3.83. PASS (Subbasin 20) Early Woodland Components Within 100 M of Permanent River (continued)

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36AL480	Open habitation (though not listed in PASS in 2001)	G	Ohio River	0	Ohio River	0	Floodplain and terraces	Early Woodland
36BT45	Open unknown function >20m radius	C	Ohio River	90	Beaver River	400	Terrace	Early Woodland
36BT50	Open unknown function	C	Ohio River	80	Beaver River	120	Terrace	Early Woodland
36BT102	Open habitation	C	Slippery Rock Creek	80	Connoquenessing Creek	100	Terrace	Early Woodland
36BT237	Open habitation	C	Slippery Rock Creek	100	Connoquenessing Creek	400	Middle Slopes	Early Woodland
36BT320	Open habitation	C	Slippery Rock Creek	0	Other	0	Not completed	Early Woodland
36BV22	Open habitation	D	Ohio River	0	Raccoon Creek	290	Terrace	Early Woodland (based on collections examination)
36BV26	Open habitation	D	Ohio River	60	Raccoon Creek	120	Floodplain	Early Woodland (based on collections examination)
36BV36	Open habitation	D	Ohio River	80	Raccoon Creek	120	Terrace	Early Woodland
36BV38	Open habitation	D	Ohio River	0	Raccoon Creek	220	Stream Bench	Early Woodland (based on collections examination)
36BV78	Village (Including Historic Indian)	D	Ohio River	100	Raccoon Creek	160	Floodplain	Early Woodland
36BV153	Open habitation	C	Slippery Rock Creek	60	Brush Creek	320	Floodplain	Early Woodland
36BV210	Open habitation	D	Ohio River	100	Raccoon Creek	140	Terrace	Early Woodland
36BV254	Open habitation	B	Ohio River	20	Beaver River	30	Floodplain	Early Woodland
36BV263	Open habitation	C	Slippery Rock Creek	80	Brush Creek	180	Floodplain	Early Woodland
36BV265	Open habitation	B	Ohio River	100	Beaver River	140	Ridgetop	Early Woodland
36CW239	Isolated Find	A	Shenango River	80	Neshannock River	660	Terrace	Early Woodland
36CW322	Open habitation	A	Shenango River	80	Neshannock River	260	Terrace	Early Woodland
36GR52	Village (Including Historic Indian)	E	Ohio River	10	Wheeling Creek	40	Floodplain	Early Woodland

Table 3.83. PASS (Subbasin 20) Early Woodland Components Within 100 M of Permanent River (continued)

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36GR110	Rock Shelter/ Cave	E	Ohio River	15	Wheeling Creek	60	Hillslope	Early Woodland
36GR120	Open habitation	E	Ohio River	60	Wheeling Creek	250	Terrace	Early Woodland
36GR123	Open habitation	E	Ohio River	20	Wheeling Creek	100	Floodplain	Early Woodland
36GR144	Open habitation	E	Ohio River	20	Wheeling Creek	140	Hillslope	Early Woodland
36LR193	PASS coded as Historic and Prehistoric	B	Ohio River	0	Mahoning River	0	Saddle	Early Woodland
36LR222	Open habitation	C	Slippery Rock Creek	0	Other	0	Not completed	Early Woodland
36ME137	Open unknown function >20m radius	C	Slippery Rock Creek	40	Brush Creek	260	Rise in Floodplain	Early Woodland
36ME155	Open unknown function >20m radius	C	Slippery Rock Creek	20	Brush Creek	450	Terrace	Early Woodland
36WH171	Open habitation	F	Ohio River	70	Chartiers Creek	270	Saddle	Early Woodland
36WH176	Open unknown function	F	Ohio River	0	Chartiers Creek	220	Terrace	Early Woodland
36WH181	Open habitation	D	Ohio River	100	Raccoon Creek	115	Hill Ridge/ Toe	Early Woodland
36WH274	Village (Including Historic Indian)	F	Ohio River	0	Chartiers Creek	80	Terrace	Early Woodland
36WH309	Open habitation	F	Ohio River	80	Chartiers Creek	400	Stream Bench	Early Woodland
36WH344	Open unknown function	D	Ohio River	0	Raccoon Creek	10	Terrace	Early Woodland
36WH387	Open unknown function	E	Ohio River	0	Buffalo Creek	320	Floodplain	Early Woodland
36WH421	Open unknown function >20m radius	D	Ohio River	0	Raccoon Creek	420	Stream Bench	Early Woodland
36WH424	Open unknown function	E	Ohio River	0	Buffalo Creek	140	Floodplain	Early Woodland
36WH475	Open unknown function	D	No translation for 353	70	Raccoon Creek	120	Terrace	Early Woodland
36WH485	Burial Mound	E	Ohio River	90	Wheeling Creek	180	Stream Bench	Early Woodland

Table 3.83. PASS (Subbasin 20) Early Woodland Components Within 100 M of Permanent River (continued)

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36WH605	Open unknown function >20m radius	E	Ohio River	0	Wheeling Creek	200	Stream Bench	Early Woodland
36WH637	Open habitation	F	Ohio River	80	Chartiers Creek	120	Hill Ridge/ Toe	Early Woodland
36WH715	Open habitation	E	Ohio River	0	Buffalo Creek	200	Terrace	Early Woodland
36WH842	Open habitation	E	Ohio River	0	Wheeling Creek	650	Stream Bench	Early Woodland
36WH913	Open unknown function >20m radius	E	Ohio River	0	Wheeling Creek	100	Floodplain	Early Woodland
36WH963	Open unknown function	B	Monon gahela River	80	Tenmile Creek	200	Saddle	Early Woodland
36WH1011	Open unknown function	B	Monon gahela River	75	Tenmile Creek	250	Saddle	Early Woodland
36WH1024	Open habitation	E	Ohio River	0	Wheeling Creek	300	Floodplain	Early Woodland
36WH1087	Village (Including Historic Indian)	E	Ohio River	90	Buffalo Creek	80	Terrace	Early Woodland
36WH1191	Open unknown function	E	Ohio River	10	Other	180	Terrace	Early Woodland

The Early Woodland site types in the larger sample (n=85; Table 3.84) are dispersed over the landscape in both lowland and upland settings. The larger sites, characterized here as villages, earthworks, and sites > 20 m in radius, seem to occur most frequently in lowland or stream valley settings. If this holds true in other western Pennsylvania drainage basins as well, then it is likely that the general Early Woodland settlement network in the region was focalized in the lowlands, supporting a dispersed system of satellite camps and special function sites.

The site distribution pattern is not particularly clarified by examining the relationship of projectile point type by landform and topographic setting (Table 3.85). The lack of discrimination is due to the limited variety in the Early Woodland projectile point types in the area sample. In this case, 83 of the sites in the larger Pennsylvania sample had projectile points listed in the database. The distribution of projectile points by landform and topographic setting is virtually identical to that seen by examining the relationship of site type to landform and topographic setting. This pattern redundancy seems to support the conclusion that most settings were being exploited throughout the Early Woodland period.

Table 3.84. PASS (Subbasin 20) Early Woodland Landform, Topographic Setting, and Site Type Summary				
Landform	**Topographic Setting**	**Site Type**	**N=**	**% of Base N=**
Lowland	Floodplain	Open habitation	11	
		Open unknown function	2	
		Open unknown function >20m radius	1	
		Village	2	
	Floodplain and terraces	Open habitation	1	
	Rise on floodplain	Earthworks	1	
		Open habitation	1	
		Open unknown function >20m radius	2	
	Terrace	Isolated Find	1	
		Open habitation	9	
		Open unknown function	8	
		Open unknown function >20m radius	2	
		Petroglyph/ Pictograph	1	
		Village	2	
Lowland N=			**44**	**51.8**
Upland	Hill Ridge/ Toe	Open habitation	5	
		Open unknown function	3	
		Village	1	
	Hillslope	Open habitation	2	
		Rock Shelter/ Cave	1	
	Hilltop	Open habitation	3	
		Open surface scatter <20 radius	1	
		Open unknown function	1	
	Middle Slopes	Open habitation	1	
	Ridgetop	Open habitation	2	
		Open unknown function	4	
	Saddle	Open habitation	3	
		Open unknown function	2	
		Open unknown function >20m radius	1	
	Stream Bench	Burial Mound	1	
		Open habitation	4	
		Open unknown function	1	
		Open unknown function >20m radius	2	
	Upland Flat	Open unknown function	1	
	Upper Slopes	Open habitation	1	
		Open unknown function	1	
Upland N=			**41**	**48.2**
Base N=			**85**	**100.0**

Table 3.85. PASS (Subbasin 20) Early Woodland Landform, Topographic Setting, and Projectile Point Summary				
Landform	**Topographic Setting**	**Associated Projectile Points**	**N=**	**% of Base N=**
Lowland	Floodplain	Adena (Stemmed)	12	
		Adena Stemmed, Cresap Stemmed, Early Woodland Stemmed, Forest Notched	1	
		Early Woodland contracting stem	1	
		Early Woodland Stemmed, Forest Notched	1	
		Early Woodland Stemmed, Robbins	1	
	Rise on Floodplain	Adena (Stemmed), Fort Ancient	3	
		Adena (Stemmed), Cresap Stemmed	1	

Table 3.85. PASS (Subbasin 20) Early Woodland Landform, Topographic Setting, and Projectile Point Summary (continued)				
Landform	**Topographic Setting**	**Associated Projectile Points**	**N=**	**% of Base N=**
	Terrace	Adena (Stemmed)	18	
		Adena (Stemmed); Meadowood	1	
		Adena Stemmed, Early Woodland Stemmed	1	
		Cresap Stemmed, Robbins	1	
		Meadowwood	2	
Lowland N=			**43**	**51.8**
Upland	Hill Ridge/ Toe	Adena (Stemmed)	9	
	Hillslope	Adena (Stemmed)	3	
	Hilltop	Adena (Stemmed)	5	
	Middle Slopes	Adena (Stemmed)	1	
	Ridgetop	Adena (Stemmed)	5	
	Saddle	Adena (Stemmed)	7	
	Stream Bench	Adena (Stemmed)	7	
		Adena Stemmed, Cresap Stemmed, Early Woodland Stemmed, Robbins	1	
	Upland Flat	Adena (Stemmed)	1	
	Upper Slopes	Adena (Stemmed)	1	
Upland N=			**40**	**48.2**
Base N=			**83**	**100.0**

The Early Woodland site types listed above include several specialized forms not previously seen in the area. The least common, but perhaps most interesting, is the Adena burial mounds. This mound type occurs in the upper Ohio River drainage, but is more common as one moves downstream past the West Virginia counties and into the upper middle Ohio River drainage. Mound sites like 36AL6 (McKees Rock Mound), Peters Mound, and Crall Mound, were present in the Pittsburgh vicinity but were effectively eradicated by urban development. The major main stem sites, for example Half Moon and Cresap mounds, were only slightly less impacted by historic developments. Sites such as 36WH276 (Meadows Mound), in a more rural, and thus less impacted setting, were present outside of the main stem valleys. Overall, the Adena mounds occur in both valley and upland settings, but, as noted above, are more common in the southern reaches of the study area than in the northern areas.

McKees Rock Mound, investigated in the late 1800s, appears to have been constructed on the remnant of Late Archaic occupations and the mound itself was modified and reused by subsequent Middle Woodland Hopewell-influenced occupants. The presence of two Madison projectile points in the mound artifact collection suggests that Late Woodland / Late Prehistoric use of the site area also occurred. Dragoo (1963:135) reports that McKees Rock Mound was the largest mound in its immediate vicinity but that "several smaller mounds" were present within 10 mi of it.

Almost all of these mounds were destroyed by historic period actions. Dragoo (1963:135) notes that while Adena moundbuilders seemed to have focused their settlement attention in the region on the Monongahela River valley area, they also entered the Allegheny and Beaver valleys as well. Their presence in the latter two basins, however, is

marginal compared to that in the Monongahela Valley and its tributary valleys and uplands and, as noted above, it appears that the Allegheny and Beaver drainage valleys served as conduits for artifacts and ideas rather than Adena populations per se.

Although the majority of Adena mounds are earth construction, Dragoo (1963:136) reports the presence of smaller stone mounds in the region also of Adena origin. He cites the Pollock's Hill Mound and the Linn Mound, both in the Monongahela Valley, as examples of the type. The mound type apparently is most common farther to the south in the Cheat River drainage of West Virginia and the style also continues to appear to the east in the Youghiogheny River drainage and into the Maryland Piedmont.

Meadows Mound is an example of one of the smaller earth mounds. Meadows Mound is located on a floodplain terrace surrounded on three sides by Chartier's Creek tributaries (Maurer 1975:45). Maurer (1975) based his descriptive summary on informant information which indicates that the mound was about 1.52 m (5 ft) in height and about 15.24 m (50 ft) across. By the time of his interviews (1970), plowing and uncontrolled excavations had reduced the mound height to about 61 cm (24 in). Other earth mounds in the immediate study area include Peters Creek Mound and Crall Mound. Peters Creek Mound was located at the confluence of Peters Creek with the Monongahela. The site was reported to be about 24.4 m (80 ft) in diameter and about 1.8 m (6 ft) in height prior to plowing. The Crall Mound was located in Monongahela City. It measured 18.2 m (60 ft) in diameter and is reported to have been about 2.7 m (9 ft) in height (Dragoo 1963:160). This mound, though of earth construction, appears to have been related to several stone mounds in the nearby vicinity.

The relationship of the sites to non-mound sites is not well understood yet. Mound construction appears to be Adena-related. Adena traits such as Adena Stemmed points and Half-Moon Cordmarked ceramics, also are present and occur at both mound and non-mound sites. However, village and hamlet sites, smaller camps, and specialized procurement locations, display characteristics that are similar, if not identical, to earlier Archaic manifestations. Adena, as a cultural entity, is marked by the hallmarks noted above in conjunction with other traits (Webb et al. 1974). Webb and Snow (Webb et al. 1974) assigned certain tobacco pipe forms, earthworks, and wooden houses to Adena as well and Dragoo (1963) added to and modified their original listings. Adena, once postulated by Webb and Snow (Webb et al. 1974) as having originated in Mexico or Central America, clearly seems to have originated in the greater middle and upper Ohio River drainage basin. Adena appears to represent a cultural coalescence focused on ceremonial architecture and perhaps supported by early horticulture. Burial mounds and ceremonial artifacts are not new to the region as both occurred in Middle Archaic and Late Archaic contexts in New York and Michigan. Adena, however, bring both together with earthworks (not as defensive structures), ceramics, and other artifact classes. Whether or not the ceremonial aspects of Adena culture simply overlay onto the indigenous Archaic base in the study region is, as noted above, still not particularly clear. Dragoo (1963) postulates actual movement of peoples into the region. This may be the case. But, the distribution of the mound sites suggests that at least that aspect of Adena culture was areally restricted to the southern portion of the study area outside of the glaciated plateau.

Villages and hamlets continue to appear in the Early Woodland in both upland and riverine settings including terraces and benches. Many of these sites are multicomponent. The Drew Site (36AL62), a multicomponent occupation, was located on the T1 terrace above Chartier's Creek, about 21 m (70 ft) above the creek and at an elevation of about 265 m (870 ft) above sea level. The Household Site (36WM61) is located on a level terrace above the Youghiogheny River. The site area is bounded by springs on both the northwest and southeast sides. The Howell Site (36AL100), located on an upland bench, was situated "2.5 kilometers east of the Youghiogheny River and 4.5 kilometers west of the Monongahela River." Adjacent to Rock Run, a tributary to the Youghiogheny, the Howell Site (36AL100) is classified by Henderson (1978) as a village. Similarly, the Thorpe Site (36AL285) also was situated on an upland hill bench "approximately 4 km southeast of the Monongahela River, and 1 km northwest of the Youghiogheny River" (George 1998:1).

House, Structure, and Feature Forms

Regionally, the Early Woodland is the first period where house and structure forms have been defined. George (1998:4-7) defined five houses (Houses 1-5), a possible sweathouse (Structure 1), and an assortment of features at the Thorpe Site (36AL285) . The Thorpe Site houses were relatively tightly packed within the investigated area and George (1998:4) postulated that each house might represent a single-season use of the site area, implying repeated re-use of the same setting but abandonment of each house annually. The house forms were not standardized and included oval (Houses 1 and 5), round (House 3), and "rectanguloid" (Houses 2 and 4; George 1998:4-5) shapes. They ranged in length from 2.30 m to 5.15 m wide (7.5 to 16.9 ft) and from 4.00 m to 5.15 m (13.1 to 16.9 ft) long (George 1998:5, Table 1; see Appendix F). All of the houses were marked by the presence of at least one hearth and most of these were not centered in the structure but offset. The hearth locations may be in response to the location of postulated doors. Four of the five houses exhibited interruptions in their exterior postmold lines, and George (1998:4) postulates that these postmold gaps may represent door locations.

The possible sweathouse (Structure 1) at the Thorpe Site is the only one identified as such in the excavation literature reviewed for this study. Relatively square (Table 3.FEA), the structure was outlined by 12 irregularly spaced postmolds in an oval (or subrectangular) shape. George (1998:5, 7) interprets a shallow, elongated pit identified in the western half of Structure 1 as a possible hearth.

George (1978) discussed the sweathouse as a structure type both in the region and ethnographically. He noted, following review of his own Ryan Site (George 1974) and Gnagey Site postmold pattern data, that 3 m (10 ft) to 2.4 m (8 ft) oval to square structures were present at both sites. He concluded that the characteristics of these structures are very similar to ethnographically reported sweathouses. As such, these structures are small relative to houses on the same sites, have one or more interior hearths, may be within a larger structure or appended to it, and may have slanted entryways. In the larger region, George notes that so-called 'turtle pits' at a site in Cattaraugus County, New York, have been interpreted by Dragoo and Lantz (1973) as sweathouses.

Several feature types have been identified at Early Woodland sites with the most common being either postmolds, including central posts, or hearths of various forms (Appendix F). The literature contains reference to earth ovens; hearths (basin-shaped, irregular); postmolds (large, standard), and pits (basin shaped). Before discussing the various types, a contextual overview is warranted.

The above-mentioned features are usually not found in isolation but rather are either associated with structures or as elements within common work spaces within hamlets/camps. At the Thorpe Site (36AL285), cultural features included eight basin-shaped hearths, four large postmolds, two hearth/postmold combinations, two irregularly shaped hearths, single examples of an earth oven, and an elongated, shallow pit (George 1998). The depth of the plowzone at the Thorpe Site (36AL285) was between 20 and 23 cm (8 and 9 in) and this depth should be considered when interpreting the relative depths of the features discussed below.

Earth ovens are not prevalent. George (1998) defined a single example at the Thorpe Site. This feature (Feature 4) was basin-shaped, relatively shallow (20 cm [8 in]), and slightly more than a half-meter in diameter (58 cm [23 in]). The feature contents included burnt sandstone fragments, an ash layer, and charcoal flecking. No ethnobotanical remains were recovered from the feature and its function as an earth oven is speculative.

The reported hearths are most commonly basin shaped though irregular forms also are known. The seven Early Woodland hearths at the Thorpe Site ranged in width from 20 to 79 cm (8 to 31 in) with an average width of 44.5 cm (17.5 in). Their lengths were not much greater; the range was from 23 to 86 cm (9 to 34 in) and the average length was 48.8 cm (19 in). As the Thorpe Site is a plowzone site, the hearth depth measurements should be considered in light of the plowzone depth noted above. The hearths ranged in depth from 1.3 cm (0.5 in) to 16.5 cm (6.5 in). Hearth contents were almost exclusively restricted to wood charcoal, burnt stone or reddened earth, and occasional chipped stone items. The latter do not appear to have been intentionally left in the hearth and none of these items are reported as heated or burned.

Postmolds have been isolated at Early Woodland sites. The majority of the postmolds tend to be relatively modest in size. George (1998:5) reports that the house- and structure-associated postmolds at the Thorpe Site range from 5.7 cm to 6.3 cm (2.2 to 2.5 in) in diameter and averaged between 7.5 to 8.6 cm (2.9 to 3.4 in) in depth. Also noted at Thorpe were significantly larger postmolds, that George (1998:6-7) interprets as central support posts for the houses. These posts ranged from 19 to 26 cm (7.5 to 10 in) in diameter.

Subsistence and Seasonality Studies

Less than 20 Early Woodland sites in the PASS (Subbasin 20) database are reported to have yielded either floral or faunal remains in undisturbed contexts. As far as could be determined based on the database entries, the floral remains were all unidentified wood

charcoal. The bone also was unidentified. Thus, the PASS (Subbasin 20) provide no subsistence data for the period.

In the study sample, only King's (1998:20) discussion of the Early Woodland Thorpe Site (36AL285) and Adovasio et al.'s (2003) summary of Meadowcroft Rockshelter (36WH297) data provide period-specific data. King (1998) reported a combined total of 0.2 gr of hickory nutshell from Features 2 and 7, in addition to a single maize kernel (from Feature 7). Wood charcoal also was found at the site. King (1998:20) noted the presence of ragweed (*Ambrosia artemisiifolia*), chenopod (*Chenopodium* spp.), and blackberry/raspberry (*Rubus* spp.), but because of their fresh appearance, attributes them to the modern period. The hickory nutshell and maize kernel provide little substantive subsistence or seasonality data. Presumably, if the interpretation is correct that Early Woodland economies are grounded in Archaic hunting/gathering and incipient Woodland horticulture, then a typical Early Woodland floral assemblage would consist of species such as hickory, walnut, and acorn accompanied by fruits such as blackberry/raspberry, semi-domesticates like chenopod, and early domesticates such as squash.

The presence of the maize kernel at the Thorpe Site (36AL285) is somewhat unexpected. However, Adovasio et al. (2003) report both squash seeds (*Cucurbita spp.*) and 16-row popcorn (*Zea mays*) from 36WH297 (Meadowcroft Rockshelter) in Early Woodland contexts. The squash seeds were found in association with Half Moon Cordmarked ceramics. Adovasio et al. (2003:75) note that the Early and Middle Woodland floral assemblages are effectively the same as those recovered from Late and Terminal Archaic contexts at the site. The only difference is the presence of domesticates which, it is noted, form a small part of the overall floral assemblage.

Artifact Assemblages and Lithic Technologies

As outlined by Mayer-Oakes (1955:78-80) and Dragoo (1963:170-174), artifacts diagnostic of the Early Woodland period include both Adena and non-Adena influenced artifact types and classes. It needs to be kept in mind that two Early Woodland groups are present in the study area during the Early Woodland period. The first represents the indigenous population. This group is following patterns established in the preceding Archaic and, in the absence of ceramics, is almost indistinguishable from their Archaic antecedents. The second group is representative of the Adena culture. The Adena are more common in the Ohio and West Virginia portions of the study area than in Pennsylvania. The corpus of Adena artifact traits is in pronounced contrast to those of the indigenous population. The Adena artifacts eventually are accepted and replicated by the resident population, however.

Chipped Stone

The projectile points diagnostic of the period include both Adena and non-Adena affiliated types and varieties. The former includes stemmed and unstemmed Adena blades, Cresap Stemmed, Kramer, and Robbins blades (stemmed and unstemmed), in addition to Early Woodland Stemmed Cluster varietals. The non-Adena points include Forest Notched

and contracting stem points. The study collections contained representatives of all of the named types except for Kramer (Table 3.86).

Table 3.86. Study Collection Early Woodland Projectile Point Types		
Period	**Type – Final**	**Total**
Early Woodland	Adena Stemmed	9
	Cresap Stemmed	9
	Early Woodland Stemmed	11
	Forest Notched	2
	Robbins	5
Early Woodland Total		**36**

Adena Stemmed points have tapered stems with oval bases. The lanceolate shaped blades are usually weakly shouldered. The type is linked with the Adena and it has been recovered from multiple Adena mound sites (Dragoo 1963). The study collection sample (Table 3.87) consisted of nine items; three of these were fragments (Site 36BV21, point measuring 28.79 mm; Site 36BV24, items measuring 37.56 and 38.84 mm). The only identified chert was Onondaga. All of the whole Adena Stemmed items in the study collection sample have lengths under the type average. Justice (1987:253) reports the average as 76.5 mm with a range of 34-150 mm. Whether or not there is a correlation between the use of LPC and shortened object or blade length is easily hypothesized. Investigation of this possibility should be examined more closely as a possible means of discriminating the use of LPC in the absence of cortical rind.

Table 3.87. Study Collection Adena Stemmed Projectile Point Summary Data							
Site	**Object Length (OL)**	**Blade Length**	**Blade Width (BW)**	**Stem Width (SW)**	**Thickness (Blade)**	**Material**	**Report Plate #**
36BV21	***28.79***	***23.52***	24.94	18.01	10.28	Chert, unidentified	D50
36BV22	36.38	19.05	18.05	16.31	7.99	Chert, unidentified	D58
36BV22	40.43	30.38	22.85	17.21	6.78	Chert, unidentified	D56
36BV24	35.55	20.48	26.06	15.91	8.46	Chert, Onondaga	D60
36BV24	***37.56***	***23.17***	20.15	14.43	7.71	Chert, Onondaga	D60
36BV24	***38.84***	***23.21***	18.17	14.68	10.45	Chert, Onondaga	D60
36BV24	44.33	31.67	20.86	14.63	9.44	Chert, Onondaga	D60
36BV24	46.78	33.89	27.34	15.32	5.19	Chert, unidentified	D60
36BV38	52.98	40.62	24.36	11.49	8.08	Chert, unidentified	D69

Cresap Stemmed projectile points were originally defined by Dragoo (1963) at the Cresap Mound in West Virginia where they occurred in contexts predating Adena Stemmed and Robbins points. In the study collection sample sites (Table 3.88), the type examples are consistently shorter than the type range (62-107 mm; Justice 1987:253). While not noted among the study collection samples, the Cresap Stemmed example in the Thorpe Site (36AL285) collection was reworked, apparently several times, and was manufactured of "light gray Flint Ridge chalcedony" (George 1998:10). George (1998:10) believes the point was reworked as a scraper and he bases this conclusion on grinding on the stem sides, asymmetrical flaking on the lateral edges, and bluntness at the distal end. The five Cresap Stemmed points in the McKees Rock Mound (Site 36AL6) collection are manufactured of an Onondaga or Onondaga-like chert (RCC 5Y4/1 brownish gray), suggesting purposeful selection for either that material or that color by the point makers.

Table 3.88. Study Collection Cresap Stemmed Projectile Point Summary Data

Site	Object Length	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Material	Appendix D Figure #
36AL6	40.4	25.7	21.0	17.7	8.2	Chert, Onondaga	D2
36AL6	42.6	26.8	21.8	13.4	8.8	Chert, Onondaga	D2
36AL6	43.8	26.8	21.8	17.4	10.5	Chert, Onondaga	D2
36AL6	46.8	34.9	25.2	12.7	5.5	Chert, unidentified	D2
36AL6	48.5	31.4	22.5	15.1	10.0	Chert, Onondaga	D2
36BV13	44.59	28.32	21.44	16.27	9.85	Chert, unidentified	D43
36BV13	58.71	39.08	31.66	21.36	11.14	Chert, unidentified	D43
36BV24	47.83		18.22	16.48	9.45	Chert, Kanawha	D60
36BV38	37.30	19.17	19.57	15.60	8.22	Chert, unidentified	D69

Early Woodland Stemmed (EWS) cluster points are varietals. The cluster suite includes Kramer, Cresap Stemmed, and Robbins points. These point types can be discriminated but their varietals often have blended characteristics and are best classified under the rubric Early Woodland Stemmed (Justice 1987: 184-188). In the study collections (Table 3.89), EWS examples were noted in six assemblages.

The Forest Notched assemblage (n=11 whole, 1 fragment) recovered at the Thorpe Site (36AL285) represents one of the largest recovered at a single site in the area. George (1998:8) reported that 59 other Forest Notched examples had been recovered from 17 additional sites in western Pennsylvania. The study collection sample included two Forest Notched points (Table 3.90).

Table 3.89. Study Collection Early Woodland Stemmed Cluster Projectile Point Summary Data								
Type	**Site**	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Material**	**Appendix D Figure #**
Early Woodland contracting stem (reworked)	36AL124	No metrics					Chert, unidentified (no cortex)	D24
Early Woodland Stemmed	36BV3	29.20	19.58	15.05	7.96	5.87	Chert, unidentified	D28
Early Woodland Stemmed	36BV22	44.44	23.83	23.19	16.28	8.82	Chert, Ohio Flint Ridge (OFR)	D58
Early Woodland Stemmed	36BV22	48.22	35.17	23.10	15.54	7.23	Chert, Onondaga	D58
Early Woodland Stemmed	36BV24	29.30	17.21	16.82	14.71	6.59	Chert, unidentified	D60
Early Woodland Stemmed	36BV24	30.75	19.92	19.16	15.19	7.21	Chert, unidentified	D60
Early Woodland Stemmed	36BV24	34.64	23.24	25.02	10.26	9.28	Chert, Onondaga	D60
Early Woodland Stemmed	36BV24	***37.02***	17.52	16.42	13.15	6.52	Chert, Onondaga	D60
Early Woodland Stemmed	36BV24	***40.32***	25.79	21.95	11.51	9.05	Chert, Onondaga	D60
Early Woodland Stemmed	36BV26	***42.08***	***28.24***	27.23	12.90	11.25	Chert, Kanawha	D67
Early Woodland Stemmed	36BV38	50.90	43.62	21.15	15.68	5.91	Chert, unidentified	D69

Table 3.90. Study Collection Forest Notched Projectile Point Summary Data							
Site	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Material**	**Appendix D Figure #**
36BV3	54.91	31.08	23.65	18.34	10.05	Chert, Onondaga	D30
36BV24	40.26	25.94	21.04	13.22	8.36	Chert, unidentified	D60

The study collection items are both complete and they appear to be within the size averages for the larger 17-site assemblage but are larger than Thorpe Site (Table 3.91; all measurements in mm).

Table 3.91. Forest Notched Projectile Point Size Comparison					
Sample	**Average Length**	**Average Width**	**Average Stem Width**	**Average Thickness**	**Reference**
17-site collection (n=59)	46.8	23.5	13.3	8.2	George 1998:23
Thorpe Site (n=11)	36.9	19.6	Not noted	8.1	George 1998:8

George (1998) completed a relatively detailed comparative study of the entire set of these points, including those from the Thorpe Site (36AL285), and concluded that the Thorpe sample overall was slightly smaller than the regional sample. The average difference in length was 9.9 mm (0.99 cm; 0.38 in) while the average difference in width and thickness was 3.9 cm (0.39 mm; 0.15 in) and a mere 0.1 mm (no conversion made) respectively. The Thorpe Site Forest Notched grouping, like the regional sampling, was manufactured from materials likely to be found locally. Included in the named chert varieties were Delaware, Onondaga, and Uniontown (George 1998:8). George (1998:10) notes that none of the examples from the regional sample, and probably the Thorpe sample as well, were manufactured of Upper Mercer or Flint Ridge cherts. This suggests to him that Forest Notched indeed does represent a Pennsylvania variant of the Ohio-origin Ashtabula point.

Contracting stemmed points occur with some frequency at Early Woodland sites. Two examples were recovered at the Thorpe Site (George 1998:10). Neither of the points exhibited extensive use wear and both of the points may represent late stage bifaces rather than completed projectile points. None of the points in the study collection conformed to the examples noted by George (1998).

Robbins blades are found throughout the Adena home territory which basically is the Ohio River drainage basin from eastern Illinois into the New York Southern Tier (Dragoo 1963; Justice 1987). The type is typically exceptionally well-made and is marked by narrow, straight stems and broad, straight to ovate blades. Although Robbins points have been recovered from mortuary contexts, they also are found amidst household debris. These blades are middle element in a tripartite continuum that begins with Adena Stemmed and ends with Snyder projectile points. Dragoo (1963) assigns the Adena type to the middle and late phases of the Early Woodland and Justice (1987), with a more recent comparative sample, accepts that assignment.

The Robbins blades in the study collection include two complete examples (Site 36BV13, item measuring 43.92 mm; Site 36BV22, item measuring 44.59 mm) and three incomplete ones (bolded and italicized on Table 3.92 below). Both of the complete items are shorter than the type range (57-100 mm; Justice 1987:253) but otherwise conform to the width and thickness ranges (29-55 mm and 6.5-10 mm; Justice 1987:253). The OFR examples may have been manufactured outside of Subbasin 20, of course, though as was noted in the Study Collection summaries earlier in this chapter, OFR debitage was present in study collection assemblages.

Table 3.92. Study Collection Robbins Projectile Point Summary Data							
Site	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Material**	**Appendix D Figure #**
36BV13	43.92	30.06	35.50	21.04	8.13	Chert, Ohio Flint Ridge (OFR)	D43
36BV13	***46.51***	***32.05***	31.42	14.19	10.67	Chert, unidentified	D43
36BV22	44.59	30.39	32.18	19.96	9.10	Chert, Ohio Flint Ridge (OFR)	D58
36BV26	***54.21***	***37.42***	36.99	21.78	9.46	Chert, Ohio Flint Ridge (OFR)	D67
36BV38	***65.55***	***48.84***	40.44	15.70	11.56	Chert, Onondaga	D69

While Adena knives were typically manufactured on Ohio Flint Ridge stone, overall most of the Early Woodland sites seem to have chipped stone assemblages that were dominated by locally available stone types. For example, at the Thorpe Site, 93 percent of the chipped stone items, including both tools and debitage were manufactured from Uniontown chert. This stone type occurs as floatstone in the site vicinity. Onondaga and Delaware chert, available to the site's inhabitants as glaciofluvial pebbles, represents only 0.6 percent of the assemblage and the exotic Ohio Flint Ridge chert is a mere 0.1 percent (George 1998:7).

The 28 chipped stone items in the McKees Rock Mound (Site 36AL6) study collection were manufactured of chert. This sample, much of which is thought by George (2001 personal communication) to relate to the Early Woodland occupation, included Ohio Flint Ridge (n=2; 7.1%), Onondaga (n=18; 64.2%), Three Mile Creek (n=1; 3.6%), and unidentified (n=7; 25%). The latter were marked by a variety of colors: RCC N3 dark gray, N4 medium dark gray, 5Y4/1 olive gray, 5YR4/1 brownish gray, 10YR6/2 pale yellowish brown, and 10R7/4 moderate orange pink. The gray colors of the unidentified cherts are common to Onondaga.

In general, the study collection Early Woodland projectile point sample provides little additional information on raw material types or colors (Table 3.93). Based on the general study collection contents, however, it does seem likely that artifact categorization based on standardized color descriptions could be a valuable sorting criteria. Robert Smith, in his examination of samples from the Site 36AL480 collection, believed that one of the first selection criteria might have been color as a quick discriminator of high- versus low-quality material (Smith personal communication 2001). Herbstritt (personal communication 2002) also concurred with this observation.

In addition to projectile points, other chipped stone tools also commonly occur in Early Woodland assemblages. The array of functional types includes both biface and uniface forms. The former includes drills, knives, and gouges. Unifacial forms include scrapers (side, end, and compound), spokeshaves, and utilized flakes.

Table 3.93. Study Collection Early Woodland Projectile Point Raw Material and Color Associations		
Material	**Color**	**N=**
Chert, Onondaga	5YR4/1: Brownish Gray Not noted	4 10
Chert, Kanawha	Not noted	2
Chert, Ohio Flint Ridge (OFR)	Not noted	4
Chert, unidentified	5YR4/1: Brownish Gray Not noted	1 14
Chert, unidentified (no cortex)	10YR6/2 pale yellowish brown	1
Total		**36**

Early Woodland bifacial drills may include hafted varieties. Dragoo (1963:115-117) reports drills with prepared bases from Cresap Mound (46MR7). George (1998:11) reports basal notching on a complete, bifacial drill from the Thorpe Site and he postulates that the notching may indicate it was hafted.

Biface knives also occur with some regularity in Early Woodland assemblages. The most unexpected example noted during the literature review was the leaf-shaped knife recovered at the Thorpe Site (36AL285; George 1998:11, also Figure 5d). The knife is manufactured on hornstone and that material "originates in Harrison and Crawford counties, Indiana, and Meade County, Kentucky" (George 1998:11).

Unifacial side scrapers recovered from the Thorpe Site (36AL285) were subjected to a detailed descriptive analysis by George (1998:14). He classified the 14 side scrapers into two broad classes: linear flake and core fragment side scrapers. Length, width, and thickness measurements are presented in addition to a measurement of the length of the retouched area. The latter is of interest when compared to the overall length of the objects. The length of the retouched edge is consistently less than 55 percent of the length of the object. This suggests that the flake or core fragment length is not critical to the scraper's function. The angle of the retouched margin on the 14 samples ranges from 28 to 79 degrees. This range suggests that the scrapers were being used in a relatively broad range of scraping or cutting angles. The range of angle among the side scrapers is in sharp contrast to those observed on the smaller endscraper sample from the same site. The four end scrapers exhibited retouch angles of 53, 75, 76, and 88 degrees. The steepness of the angles on three of the four artifacts suggests similarity in use repose, though George (1998:14-15) rightfully does not speculate on possible functions.

Other Artifact Classes

As noted elsewhere, the ground stone category includes both ground and pecked stone. For the Early Woodland period, artifact types in the ground stone class include celts, cutters, gorgets, ground hematite, mortars, mullers, pendants, pestles, pipes (stone, also ceramic), and tablets. A possible ground/pecked sandstone bowl also has been recovered in what appears to be an Early Woodland context at Site 36AL480 (Fenicle 2003). No other examples of this artifact type were noted in the Early Woodland literature examined for the

context study. Pecked stone objects include abraded / abrader stones, grubbers (teshoas), hammerstones (pebble, cobbles), and pitted / nutting stones. Dragoo (1963) and George (1998) present detailed ground stone discussions with accompanying illustrations. Their conclusions concerning various types are summarized briefly below.

The Thorpe Site (36AL285) celt measures 5.7 cm long, 4.2 cm wide, and 1.85 cm thick (though George [1998:17] notes the poll is missing). The specimen was manufactured of granite and George (1998:17) assigns it to the medium celt class defined by Dragoo (1963) from the Cresap Mound celt assemblage.

George (1998:17) classifies a single hematite piece as a cutter based on the presence of a bi-convex edge on one side. The item measures 6.5 mm long, 4.7 cm wide, and it is a maximum of 0.9 mm in thickness. George (1998:17) notes that hematite celts of similar form to his cutter are noted by Dragoo (1963) and Mayer-Oakes (1955) as occurring at Cresap Mound.

Early Woodland gorgets are typically well made, handsome objects. The gorgets are made from a variety of materials, but commonly are produced of siltstone, slate or chert. An example from the Thorpe Site was manufactured of gray blue slate (5GY5/1) and, if complete, is estimated to have been about 82 mm (3.2 in) in length. The Thorpe Site example is classified as an indented gorget and George (1998:16) states "there are no similar specimens recorded for the Upper Ohio Valley." Converse (1978) indicates that the type, though not common, occurs most commonly in northcentral and western Ohio. Dragoo (1963:182-183) presents a typological scheme for gorgets. The scheme is based on form, and he classifies UOV gorgets as: Category A, quadri-concave; Category B, reel-shaped; Category C, semi-keeled; Category D, expanded-center bar; Category E, rectangular; Category F, elliptical; and Category G, bow tie. The schemata is simply descriptive.

Similar in form and configuration to gorgets are Adena tablets. The tablets may have been used for paint or herbal preparation as well as bone tool sharpening stones (Dragoo 1963:180). Dragoo (1963:180, 182) recognized four varieties of Adena tablets. As was the case with his gorget typology, he categorized the tablets on the basis of form. The four tablet varieties are: Category A, irregular; Category B, formal; Category C, engraved; and Category D, zoomorphic. According to Dragoo (1963:182), the engraved and zoomorphic forms are rare and none had been found in Pennsylvania as of his writing.

George (1998:17) notes a single piece of ground hematite recovered at the Thorpe Site (36AL285). Only one face of the piece was ground. While ground hematite fragments are recovered from sites of several periods, George (1998:17) notes that Dragoo (1963) recovered 35 examples from Cresap Mound.

The pecked stone artifacts are noteworthy only in their commonality. Three hammerstone raw materials (sandstone, chert, and pebble) were noted by George (1998:17-19) at the Thorpe Site (36AL285). The sandstone hammerstones weighed between 25 and 78.2 gr (0.9 and 2.7 oz). Because of their rough surfaces, George (1998:17) hypothesizes that the sandstone hammerstones were used for biface edge abrading. The single chert

hammerstone, which weighed 113.4 gr (4 oz) displayed battering scars at one end. The tool was manufactured on Uniontown chert. In contrast to the smallish sandstone and chert hammerstones, George's (1998:17-19) so-called pebble hammerstones are sometimes actually cobble in size and weighed between 56.7 and 510.3 gr (2 to 18 oz).

The grubbing, pitted, and nutting stones recovered from the Thorpe Site (36AL285) display modification on one or two surfaces or edges. The grubbing tools appear to have been "tools of opportunity" that had one wedge-shaped edge. George (1998:19) notes the edges are now "undulating and flattened by use." He provides no measurements or material data on the grubbing tools.

The pitted stone examples from the Thorpe Site (36AL285) include two examples with single pits each, and a third with two pits. The four pits measure 24 by 26 mm (0.9 by 1 in), 18 by 21 mm (0.7 by 0.8 in), 21mm (0.8 in) in diameter, and 26 mm (1 in) in diameter. With a single exception of 5 mm (0.2 in), all the pits were 3 mm (0.1 in) deep. These pits contrast with those identified on the Thorpe Site (36AL285) nutting stone. The nutting stone had 15 pits covering two sides of its surface. The pits ranged in diameters from 18 to 36 mm (0.7 to 1.4 in) with depths of 7 to 17 mm (0.3 to 0.7 in).

The Early Woodland period heralds the in situ presence of the Half-Moon Cordmarked and Fayette Thick ceramic series. Late in the period, McKees Rock Plain and Adena Plain ceramics begin to appear. Johnson (2001) notes that Half-Moon Cordmarked sherds were found in association with Adena Plain ceramics at the Crawford-Grist #2 Site (36FA262; see also Grantz 1986). These ceramic wares, to a large extent, are differentiated from one another on the bases of tempers and decorative elements.

Half-Moon Cordmarked was originally defined by Mayer-Oakes (1955:184, 189) and represents the earliest pottery type in the study region. Half-Moon (also presented as Half Moon in the literature) Cordmarked is most closely is related to Fayette Thick in both configuration and composition. The temper is usually igneous, chert, or limestone grit with fragments up to 10 mm (0.4 in) in diameter. The temper may account for 50 t0 80% of the paste volume and the paste itself is usually "contorted and irregular" (Mayer-Oakes 1955:189) because of the amount of the temper. Vessel walls range in thickness from 10 to 20 mm (0.4 to 0.8 in). Like Fayette Thick, mammiform and oval lugs do occur on the vessels which are commonly "elongated globular" in form. Vessel necks are usually straight. Half-Moon Cordmarked interior surfaces are usually smoothed or lightly cordmarked, striated, or fabric-impressed. Exterior cordmarking is common, with occasional striated, incised, or fabric impressed elements. Though Mayer-Oakes (1955:189) defined the provisional type varieties "Bolinger Striated" and "Legionville Fabric-impressed", these two variety names do not appear to be in widespread use.

Fayette Thick is within the same family of thick, grit tempered wares that include Exterior Cordmarked / Interior Smoothed, Half-Moon Cordmarked, Marion Thick, and Vinette 1 ceramic wares. The type was originally described by Griffin (1943:667-669) who noted that the ceramics were notable in "their thickness and the size of their tempering particles." Depending on the area of manufacture, Fayette Thick can be tempered by

limestone, chert, or other metamorphic rock. Exterior surfaces are cordmarked but the cordmarking partially obliterated. Griffin (1943:668) stated that the cordmarks did not appear to be intentionally smoothed. When cordmark direction is obvious, the cordmarking is vertical on the vessel body though cording on the rims may be both horizontal and oblique. A small number of the sherds in Griffin's original sample from the Peters Village Site (14Fa 14), Fayette County, Kentucky, displayed either cordmarking or fabric impressions on their interiors. This appears to be the residue of manufacture and is not an intentional decoration. The only decorations noted in the original type description are pinches or knobs. These can occur over the surface of the vessel but the knobs are most common near the rim and are interpreted as lugs or handles.

McKees Rock Plain also was defined by Mayer-Oakes (1955:190-191). This chert temper, plain-surface ceramic type is visually similar to Half-Moon Cordmarked though the paste is "more compact than that of 'Half-Moon Cordmarked'" (Mayer-Oakes 1955:190). Temper size is usually about 10 mm (0.4 in) and the vessel walls are slightly thinner than Half-Moon Cordmarked, ranging from 8 to 14 mm (0.3 to 0.5 in) in thickness. Mayer-Oakes (1955:190) noted no surface decoration except on a single fragment which displayed a broad-trailed incised line in the neck area.

Adena Plain is defined by the co-occurrence of either limestone or grit temper (depending on the area), thickened rims with or without rim strips, rim nodes, and flattened to rounded vessel bases (Griffin, in Webb et al. 1974:223). The type, originally defined by Haag (1940) and based on ceramics recovered from Sites 14Mm6 and 14Mm7 of the Wright Mound complex, Montgomery County, Kentucky, is thinner than Fayette Thick. While grit tempered also, the temper inclusions usually are from 1.5 to 2 mm in size, though Haag (1940:76) notes that inclusions up to 5 mm have been identified. Vessel surfaces are standardly smoothed and some may appear burnished. The hallmark of the type is the thickened rim which is achieved by the addition of an actual rim strip. The rims are commonly outflaring and the degree of the flare is quite variable. Haag (1940:76), in the original type description, notes that the majority of the rims are from wide-mouthed jars. Adena Plain postdates Fayette Thick and it occurs in early Middle Woodland contexts in addition to late Early Woodland.

Research Issues – Early Woodland

The paramount questions for the Early Woodland period in the study area are those that focus on chronology, settlement strategies, subsistence, and artifact assemblage. If the Terminal Archaic is an actual cultural construct, then certain Early Woodland hallmarks may have to be subsumed within the Terminal Archaic suite of characteristics, depending on radiocarbon dates. Certainly the introduction of an Adena cultural overlay onto the indigenous base culture suggests that at least two sets of cultural traits are at play in the region during at least the later half of the Early Woodland. Thus, the research issues for the Early Woodland focus on the identification of diagnostic characteristics that can be used to discriminate Late/Terminal Archaic from Early Woodland and indigenous Early Woodland from Adena Early Woodland.

The first issue deals with chronology. The Terminal Archaic absolute dates overlap those of the Early Woodland, while terminal Early Woodland dates overlap those of the subsequent Middle Woodland. The primary chronology research issue is as follows.

- Are the Early Woodland beginning and ending dates little more than general markers which vary from valley to valley within the study area? If this is the case, what does this imply about the rates of culture change and the influences which lead to culture changes in the study area?

- Changes in settlement patterns might be anticipated in the Early Woodland if, indeed, horticulture plays any substantive role in the culture's economy. Further, if the Adena are selecting specific settings for their mound sites, this should be obvious in an examination of the PASS (Subbasin 20) and OHPO (Leetsdale) UTM data sets.
- Research avenues pertinent to these issues and settlement strategies in general include the following.
- An examination of the PASS (Subbasin 20) site distribution data suggests that there is no significant difference between Late/Terminal Archaic and Early Woodland site settings in the study region. Would this likely be the case even if horticulture played a significant role in the period's economies as base camp, hamlet, and village locations would all tend to be located in well-watered loci?

- The PASS (Subbasin 20) database indicates that Adena site types, including burial mounds and earthworks, are located in the study area on stream benches and floodplain rises. However, the regional literature indicates that the distribution of these site types across the landscape is much broader. What factors might account for a restricted site distribution in the study area versus a broader distribution pattern outside of the study area?

- Subsistence data for the Early Woodland in the study area is not substantive. The recovered floral and faunal specimens indicate that exploitation patterns were much the same as for preceding periods. The following are research questions relevant to this issue.
- Feature configurations at Early Woodland sites do not appreciably differ from those of preceding periods though, admittedly, the data sets are not particularly large. Does this suggest that food preparation and storage was unchanged from earlier periods? Why would this be the case when container technology (marked by ceramics) differs appreciably from that of earlier periods?

- Both semi-domesticates (chenopod and amaranth) and domesticates (squash and corn) are present in Early Woodland floral assemblages. Yet, neither group apparently has a major role in the period economy. Culturally, what would be the expected differences between Late/Terminal Archaic and Early Woodland if one group has the advantage (or disadvantage) of reliance on semi-domesticate and domesticated plant foods?

The Early Woodland study collection metric data indicates that Early Woodland projectile points in the area are consistently shorter than their type norms. This is a pattern seen in earlier Archaic assemblages, though not in the Late Archaic collection. The same questions posed earlier concerning the metric deviation are posed for the Early Woodland as well.

- Are the chipped stone, raw material sources being used in the Early Woodland the same ones exploited during the earlier Archaic periods? If yes, which sources are they?

- Although the Early Woodland study collection specimens do not fit the length ranges for the respective types, their widths, thicknesses, and conformation are usually about the same. Could factor(s) other than raw material source characteristics result in a preference for shorter, but not narrower or slimmer projectile points?

Middle Woodland (A.D. 100 – A.D. 900)

The Middle Woodland period in the study area is defined as a true transition period between the Adena and the Monongahela cultures. The incidence of early Middle Woodland sites and components is actually less than that of the preceding Early Woodland. This may suggest that extraneous forces related to Hopewell incursions were displacing groups of the indigenous population. Once the Middle Woodland population stabilizes, however, Middle Woodland sites with Hopewell artifact types are actually more plentiful numerically than those of the subsequent Late Woodland / Late Prehistoric Period. The reason for later reduction may lie with Late Woodland / Late Prehistoric Monongahela centralization (Nass and Hart 2000).

Cultural Chronology

The temporal parameters for the Middle Woodland (100 B.C. - A.D. 900) as defined by Cowin (1985) differ dramatically from those used by Adovasio et al. (2003) and Nass and Hart (2000:129), for example. Adovasio et al. (2003) posit the end of the Early Woodland at A.D. 100 and the area's radiocarbon dates seem to support their terminal Early Woodland date (Appendix I). Nass and Hart (2000) offer the time period from A.D. 500 to 1000 as Late Woodland, and follow Seeman (1992) by dividing the period into early Late Woodland (A.D. 500-700) and late Late Woodland (A.D. 700-1000). Cowin's terminal date for the Middle Woodland is retained here because the radiocarbon dates in the study area seem to support her assignment (Appendix I). It should be kept in mind, however, that the available suite of Middle Woodland dates is small and Nass and Hart (2000) could be correct in assigning the termination of Middle Woodland to the much earlier A.D. 500. The resolution of the issue may hinge on the degree to which Hopewell-like characteristics linger in the study region before being overwhelmed by other cultural entities.

Site Settlement Patterns

Like other areas of the eastern Midwest and Northeast, the patterns of settlement for the Middle Woodland are poorly understood (Stewart 2003). There is no true Hopewell presence except in the Ohio portion of the study area. However, Hopewell influence is seen in the presence of burial mounds and artifact assemblages throughout the study area and it is the diagnostic artifacts, in particular, that form the basis for the assignment of sites in the area to Middle Woodland.

Classically, Hopewell is defined as a Woodland culture which is marked by burial mounds, horticulture, and an extensive trade and interaction network that engages much of the eastern United States. Adena and Hopewell are linked because of similar uses of both burial mound and earthwork features. Adena, however, does not beget Hopewell though both cultural groups appear to have their origins in the middle Ohio River valley of Ohio and Kentucky.

The Hopewell artifact suite is marked by the presence of exotics such as copper objects, galena crystals, mica, marine shell, and various high-quality cherts, including Flint Ridge (Mayer-Oakes 1955, Cowin 1985, McConaughy and Johnson 2003). Hallmark projectile points of the Hopewell include Manker Stemmed and Corner-Notched, Chesser Notched, and Snyders. As Cowin notes (1985:187), many Hopewell projectile points are produced on Flint Ridge and other Ohio raw materials.

Evidence of Middle Woodland Hopewell presence or influence has been documented for the Ohio-Beaver drainages and Mayer-Oakes (1955) illustrates examples of Hopewell trait list items throughout his manuscript. At least one small mound site (36LR3) was reported in the Mahoning River drainage, and a larger mound (33TR5) was present just outside of the Beaver drainage boundaries. McConaughy and Johnson (2003) report on the Sugar Run Mound (36WA359) and village (36WA2) in Warren County near the confluence of the Allegheny River and Sugar Run. Their article provides additional information on the suite of sites in Trumbull and Mahoning counties, Ohio, and Crawford, Erie, Lawrence, and Warren counties, Pennsylvania, which have cist tomb mounds containing Middle Woodland Hopewell trade items (McConaughy and Johnson 2003; also Cowin 2003). More such sites may once have been present, however, and as noted by McConaughy and Johnson (2003) and Cowin (1985, 2003), the mounds were eradicated or severely truncated by historic agricultural practices.

The PASS (Subbasin 20) sample of Middle Woodland components within 100 m of permanent water consists of 47 site locations (Table 3.94). The site locations, for the most part, are the same topographic settings that were being exploited in the preceding Early Woodland.

Table 3.94. PASS (Subbasin 20) Middle Woodland Components Within 100 M of Permanent River								
Site	**Site Type**	**Subbasin 20 Watershed**	**Major Stream**	**Distance (m) to Major Stream**	**Minor Stream**	**Distance (m) to Minor Stream**	**Topographic Setting**	**Period**
36AL6	Earthworks	F	Ohio River	60	Chartiers Creek	520	Rise on floodplain	Middle Woodland (collection examination)
36AL62	Village (Including Historic Indian)	F	Ohio River	80	Chartiers Creek	360	Hill Ridge/ Toe	Middle Woodland
36AL158	Open habitation	G	Ohio River	100	Sewickley Creek	140	Lower Slopes	Middle Woodland
36AL202	Open habitation	G	Ohio River	30	Sewickley Creek	60	Floodplain	Middle Woodland
36AL245	Open habitation	G	Ohio River	80	Sewickley Creek	110	Hill Ridge/ Toe	Middle Woodland
36AL480	Open habitation (not listed in PASS 2001)	G	Ohio River	0	Ohio River	0	Floodplain and terraces	Middle Woodland (collections examination)
36BT8	Open habitation	C	Slippery Rock Creek	90	Brush Creek	220	Rise in Floodplain	Middle Woodland
36BT17	Open unknown function	C	Ohio River	30	Beaver River	300	Stream Bench	Middle Woodland
36BT78	Open habitation	C	Ohio River	20	Beaver River	220	Lower Slopes	Middle Woodland
36BT358	Open habitation	C	Slippery Rock Creek	0	Other	0	Not completed	Middle Woodland
36BV11	Unknown Function Surface Scatter < 20M Radius	D	Ohio River	40	Raccoon Creek	40	Hilltop	Middle Woodland (collections examination)
36BV14	Open habitation	D	Ohio River	60	Raccoon Creek	180	Floodplain	Middle Woodland (based on collection examination)
36BV22	Open habitation	D	Ohio River	0	Raccoon Creek	290	Terrace	Middle Woodland (based on collections examination)
36BV26	Open habitation	D	Ohio River	60	Raccoon Creek	120	Floodplain	Middle Woodland (based on collections examination)
36BV36	Open habitation	D	Ohio River	80	Raccoon Creek	120	Terrace	Middle Woodland
36BV38	Open habitation	D	Ohio River	0	Raccoon Creek	220	Stream Bench	Middle Woodland (based on collections examination)

Table 3.94. PASS (Subbasin 20) Middle Woodland Components Within 100 M of Permanent River (continued)

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36BV197	Open habitation	B	Ohio River	50	Beaver River	160	Terrace	Middle Woodland
36BV248	Open habitation	D	Ohio River	0	Raccoon Creek	50	Terrace	Middle Woodland
36BV265	Open habitation	B	Ohio River	100	Beaver River	140	Ridgetop	Middle Woodland
36BV266	Open habitation	B	Ohio River	80	Beaver River	100	Middle Slopes	Middle Woodland
36CW324	Open habitation	A	Shenango River	100	Neshannock River	240	Rise in Floodplain	Middle Woodland
36CW367	Open habitation	A	Shenango River	60	Neshannock River	220	Hill Ridge/ Toe	Middle Woodland
36GR52	Village (Including Historic Indian)	E	Ohio River	10	Wheeling Creek	40	Floodplain	Middle Woodland
36LR3	Open unknown function >20m radius	B	Ohio River	10	Mahoning River	150	Floodplain	Middle Woodland
36LR165	Open unknown function >20m radius	B	Ohio River	100	Mahoning River	130	Floodplain	Middle Woodland
36LR203	Lithic Reduction	B	Ohio River	0	Other	0	Not completed	Middle Woodland
36ME114	Open surface scatter <20m radius	A	Shenango River	20	Neshannock River	200	Floodplain	Middle Woodland
36WH182	Open Prehistoric Site, Unknown Function	F	Ohio River	100	Chartiers Creek	360	Saddle	Middle Woodland
36WH274	Village (Including Historic Indian)	F	Ohio River	0	Chartiers Creek	80	Terrace	Middle Woodland
36WH349	Open habitation	D	Ohio River	80	Raccoon Creek	310	Middle Slopes	Middle Woodland
36WH456	Open unknown function	F	Ohio River	40	Chartiers Creek	80	Floodplain	Middle Woodland
36WH486	Open unknown function	E	Ohio River	100	Wheeling Creek	230	Saddle	Middle Woodland
36WH674	Open Unknown Function	E	Ohio River	0	Buffalo Creek	310	Floodplain	Middle Woodland
36WH732	Open unknown function	E	Ohio River	100	Buffalo Creek	560	Terrace	Middle Woodland
36WH956	Open Unknown Function	B	Mononga-hela River	5	Tenmile Creek	350	Floodplain	Middle Woodland
36WH994	Open Unknown Function	F	Ohio River	30	Chartiers Creek	40	Terrace	Middle Woodland

Table 3.94. PASS (Subbasin 20) Middle Woodland Components Within 100 M of Permanent River (continued)

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36WH998	Open habitation	E	Ohio River	40	Wheeling Creek	100	Stream Bench	Middle Woodland
36WH999	Open habitation	E	Ohio River	0	Wheeling Creek	0	Floodplain	Middle Woodland
36WH1001	Open Unknown Function	E	Ohio River	80	Buffalo Creek	340	Saddle	Middle Woodland
36WH1006	Open Unknown Function	E	Ohio River	75	Buffalo Creek	160	Stream Bench	Middle Woodland
36WH1008	Open Unknown Function	E	Ohio River	75	Buffalo Creek	120	Ridgetop	Middle Woodland
36WH1009	Rock Shelter/ Cave	E	Ohio River	100	Buffalo Creek	240	Terrace	Middle Woodland
36WH1014	Open Unknown Function	E	Ohio River	40	Buffalo Creek	200	Stream Bench	Middle Woodland
36WH1087	Village (Including Historic Indian)	E	Ohio River	90	Buffalo Creek	80	Terrace	Middle Woodland
36WH1109	Unknown Function Open Site > 20M Radius	F	Ohio River	40	Chartiers Creek	320	Upland Flat	Middle Woodland
36WH1153	Open unknown function >20m radius	F	Ohio River	60	Other	340	Saddle	Middle Woodland
36WH1158	Open unknown function >20m radius	F	Ohio River	60	Other	60	Terrace	Middle Woodland

In the larger PASS (Subbasin 20) Middle Woodland sample, 54 sites with coded topographic settings have diagnostic Middle Woodland projectile points attributed to them either in the PASS database or via the study collection results. A comparison of topographic setting by projectile point type is presented on Table 3.95. The comparison suggests that most points are found in all lowland settings. However, Raccoon Notched and Snyders points tend to (1) co-occur in the same upland settings and sometimes on the same sites, and (2) Snyders points, in general, are not well represented in lowland settings. The implications of the Snyders point distribution in light of its Hopewell link is not understood. It is noteworthy here that no Synders points were identified in the study collections, though Raccoon Notched points were present. As the study collection sites were lowland sites, the absence of Snyders points may reflect actual selection for upland settings on the part of the Snyders-point manufacturers.

Table 3.95. PASS (Subbasin 20) Middle Woodland Landform, Topographic Setting, and Projectile Point Summary				
Landform	**Topographic Setting**	**Associated Projectile Points**	**N=**	**% of Base N=**
Lowland	Floodplain	Garver's Ferry Corner Notched, Jack's Reef Corner Notched, Kiski Notched, Manker Corner Notched, Manker Stemmed, Raccoon Notched	1	
		Garver's Ferry Corner Notched, Kiski Notched	1	
		Jacks Reef	2	
		Jack's Reef Corner Notched, Jack's Reef Pentagonal, Manker Stemmed	1	
		Kiski Notched, Manker Stemmed	1	
		Raccoon Notched	2	
		Raccoon Notched; Jacks Reef	1	
		Raccoon Notched; Triangles	3	
	Floodplain and terraces	Kiski Notched	1	
	Rise in Floodplain	Garver's Ferry Corner Notched, Jack's Reef Pentagonal, Kiski Notched, Manker Stemmed	1	
		Jacks Reef	2	
		Jack's Reef Pentagonal, Kiski Notched	1	
	Terrace	Garver's Ferry Corner Notched, Manker Stemmed	1	
		Jacks Reef	3	
		Kiski Notched, Manker Corner Notched	1	
		Kiski Notched, Manker Stemmed	1	
		Raccoon Notched	5	
		Raccoon Notched	1	
		Snyders	6	
Lowland N=			**35**	**53.8**
Upland	Hill Ridge/ Toe	Jacks Reef	1	
		Snyders	2	
		Snyders (PASS), Garver's Ferry Corner Notched, Kiski Notched	1	
	Hillslope	Jacks Reef	1	
	Hilltop	Jacks Reef	2	
		Jack's Reef Pentagonal, Manker Corner Notched, Manker Stemmed	1	
		Raccoon Notched	1	
		Snyders	1	
	Lower Slopes	Jacks Reef, Snyders	1	
		Raccoon Notched	1	
		Triangles; Raccoon Notched	1	
	Middle Slopes	Jacks Reef	1	
		Raccoon Notched	1	
		Snyders	1	
	Ridgetop	Snyders	2	
	Saddle	Jacks Reef	1	
		Jacks Reef, Raccoon Notched	1	
		Jacks Reef, Snyders	1	
		Snyders	2	
	Stream Bench	Jacks Reef	2	
		Kiski Notched	1	
		Raccoon Notched	2	
		Snyders	1	
	Upper Slopes	Jacks Reef	1	
Upland N=			**30**	**46.2**
Base N=			**65**	**100.0**

House, Structure, and Feature Forms

Of the reports examined for this study, five contained information on house, structure, and feature types (Appendix J) on confirmed Middle Woodland features. The site reports dealt with 36AL40 (Portman Site; Buker 1993), 36AL124 (Benedict and Kingsley 1995), 36BV240 (Dravo Site; Davis and Lantz 1987), 36BV292 (Connoquenessing Site; Petraglia et al. 1992, Knepper and Petraglia 1993), and 36WM717 (Billy #3; George 1992a). A single possible house outline was identified at Site 36WM717 (Billy #1) and George (1992a) describes the isolated, 7- by 10-m (23- by 33-ft) structure. The house was oriented northwest to southeast with larger posts located on the western side. George (1992a:9) postulated that the presence of the larger posts (30 cm; 11.8 in) was indicative to their use as structural supports against the prevailing winds in the area.

Middle Woodland features types are similar to those defined in preceding periods. The documented forms in the study-sample reports include basin-shaped and oval hearths (George 1992a; Petraglia et al. 1992; Knepper and Petraglia 1993; and Davis and Lantz 1987); and basin-shaped, circular, irregular, ovate, roasting, shallow basin, and storage pits (Benedict and Kingsley 1995; Buker 1993:14; George 1992a:9-10; and Knepper and Petraglia 1993). The two measured hearths in the sample were an oval measuring 41 by 20 cm (16.1 by 7.9 in) and a round example that was 75 cm (29.5 in) in diameter.

The various pit features included six irregular shaped pits, three basin shaped pits, two examples each of circular and ovate, and single examples of a roasting pit, a shallow pit, and a storage pit. Buker (1993: 14) summarized the eight features from the Portman Site (36AL40) but did not present individual measurements for them. He noted that the pits, which included circular (n=1), ovate (n=1), and irregular (n=6) forms, ranged in size from 0.5 to 1.8 m (1.6 to 5.9 ft). The circular and ovate pits were both rock filled and one of the irregular pits may have contained evidence of a child burial. The bone preservation, however, was very poor and definite identification was not possible.

As regards the other feature types, their individual measurements and contents are detailed in Appendix J. To summarize, the basin-shaped pits (George 1992a, Knepper and Petraglia 1993) ranged in size from a 30 cm (11.8 in) round to an oval measuring 118 cm (46.45 in) by 87 cm (34.6 in). All three basin features contained either FCR or fire-reddened cobbles, implying thermal use. This was also the case with the other features as well; each of the forms contained rock fragments, FCR, charcoal, and ash or displayed light oxidization.

Two of the features contained floral domesticates. The roasting pit documented by Benedict and Kingsley (1995:22) at Site 36AL124 yielded a corn cupule and a bean. A hearth at Billy #3 (36WM717; George 1992a:9) produced a squash (*Cucurbita* spp.) rind fragment. Otherwise, the features commonly contained small amounts of ceramics and/or chipped stone artifacts, in addition to occasional charcoal, pollen, and non-domesticate seeds.

Subsistence and Seasonality Studies

In the study set, subsistence and seasonality data were restricted. The recovered floral species, with the possible exception of the domesticated species and the grasses, suggest late summer and autumn harvesting. Adovasio et al. (2003) provide summary data on both Early and Middle Woodland floral data from Meadowcroft Rockshelter (36WH297). Their Middle Woodland data confirms the presence of 10, 12, and 14 row *Zea mays*, *Cucurbita* spp., and the following non-domesticates: *Amaranthus* spp. (amaranth), *Carya* spp. (hickory nut), *Celtis* spp. (hackberry), *Juglans* spp. (walnut), *Prunus* spp. (cherry), *Rubus* spp. (blackberry/raspberry), *Vaccinium* spp. (goosefoot), and *Vitis* spp. (grape).

Faunal recovery reported by Adovasio et al. (2003) from the Meadowcroft Rockshelter (36WH297) Middle Woodland deposits duplicate those recovered from the preceding Late / Terminal Archaic and Early Woodland levels at the site. The species recovered included *Bonasa umbellus* (ruffled grouse), *Cervus elaphus* (elk), *Lophodytes cucullatus* (hooded merganser), *Meleagris gallopovo* (turkey), and *Odocoileus virginianus* (white tailed deer). Restricted to the Woodland levels were *Elliptio dilatatus* (freshwater mussel, Cross Creek), *Lampsilis ovata* (freshwater mussel, Ohio River), and *Terrapene carolina* (box turtle). Knepper and Petraglia (1993:127-128, Table 8-12) sampled Middle Woodland projectile points recovered from the Connoquenessing Site (36BV292) and recovered blood residues from deer, dog, and rabbit. As noted in the Late Archaic discussion of the same study, the deer group includes both deer and moose and the dog group encompasses dog, fox, and wolf. The rabbit group includes both rabbit and hare. To a large extent, any of the faunal species, including the various aquatic ones, could be recovered annually.

Artifact Assemblages and Lithic Technologies

Sites of the Middle Woodland period remain poorly investigated probably because of the poorly defined temporal parameters for the period. Hallmark projectile point types include Jack's Reef Corner Notched (late), Murphys Stemmed, Raccoon Notched, and triangles (also late) in addition to the aforementioned Hopewell linked types such as Snyders. The ceramic groups remain dominated by Watson limestone tempered, cordmarked varieties while the minor artifact classes include both Hopewell-linked exotic goods and locally manufactured bone, shell, ground stone, and pecked stone varieties. These are discussed below.

Chipped Stone

Projectile points considered diagnostic of the Middle Woodland in the study region include Garver's Ferry Corner Notched, Jack's Reef Corner Notched and Pentagonal, Kiski Notched and Stemmed, Manker Corner Notched and Stemmed, Murphy Stemmed, Raccoon Notched, Snyders, and triangles (late) (Custer 2001; Petraglia et al. 1992b). All of these types except Murphy Stemmed and Snyder were identified in the study collections (Table 3.96).

Table 3.96. Study Collection Middle Woodland Projectile Point Types		
Period	**Type**	**N=**
Middle Woodland	Garver's Ferry Corner Notched	13
	Jack's Reef Corner Notched	5
	Jack's Reef Pentagonal	4
	Kiski Notched	15
	Kiski Stemmed	1
	Manker Corner Notched	3
	Manker Stemmed	18
	Raccoon Notched	6
Total		**65**

The Garver's Ferry type tends to be small and is, by definition, corner notched. Examples recovered from the Connoquenessing Site (36BV292) were consistent with the type description and had been manufactured of Delaware, Onondaga, and Zaleski cherts (Petraglia 1992b:238). Justice (1987:220) assigns Garver's Ferry Corner Notched, Kiski Notched, and Murphy's Stemmed as morphological correlates to Raccoon Notched in the Jack's Reef Cluster.

The study collection sample of Garver's Ferry items includes 13 items. Of that number, four artifacts are fragmentary (bolded and italicized on Table 3.97 below). The incomplete item from Site 36BV21 was manufactured on OFR. The use of this material is somewhat unexpected as the projectile point type tends to be restricted to the western Pennsylvania region. The use of OFR for its manufacture may indicate that biface blanks or undressed raw material is being brought into the study area for eventual dressing or use.

Table 3.97. Study Collection Garver's Ferry Corner Notched Projectile Point Summary Data							
Site	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Chert Type**	**Appendix D Figure #**
36AL62	25.8	20.2	19.4	14.1	5.1	unidentified	D14
36BV13	26.01	17.27	19.38	13.49	6.40	unidentified	D42
36BV13	43.73	33.03	32.82	21.39	7.13	unidentified	D43
36BV21	***24.05***	***17.62***	23.36	15.97	6.16	Ohio Flint Ridge (OFR)	D50
36BV21	27.59	20.38	21.61	18.12	7.01	unidentified	D50
36BV21	46.25	38.18	30.64	17.41	9.00	unidentified	D50
36BV24	***24.07***	***14.62***	23.35	17.06	5.87	unidentified	D61
36BV24	28.15	22.67	***19.01***	14.88	4.94	Cochocton	D61
36BV24	28.92	20.00	21.80	13.00	5.68	unidentified	D61
36BV24	29.82	22.25	23.37	***12.01***	6.64	unidentified	D61
36BV24	60.53	21.66	24.62	16.05	6.93	Onondaga	D61
36BV26	28.06	21.37	26.05	18.49	6.36	unidentified	D67
36AL124	23.00					unidentified	D24?

Jack's Reef Corner Notched projectile points begin to appear in the late Middle Woodland and continue to be made in the early Late Woodland. The type is ubiquitous across the eastern Midwest, upper Mid-Atlantic and lower New England regions.

Manufactured using both percussion and pressure techniques, many Jack's Reef points are delicate in appearance and exhibit thin, flat cross-sections (Church and McDaniel 1992:41; Custer 2001:34).

The study collection sample includes nine items representing both Jack's Reef Corner Notched and Pentagonal styles (Table 3.98). A third of the study collection items are manufactured on 'exotic' cherts (OFR and Cochocton) suggesting that the westward influence that becomes pronounced in the Early Woodland via Adena continues perhaps via Hopewell in the Middle Woodland. Certainly types like Garver's Ferry, Jack's Reef, and Manker in the study collection are being manufactured on OFR and Cochocton while the local varieties, like Kiski and Raccoon Notched are being made on materials that are likely locally available.

Kiski Notched projectile points were defined by George (1982) and are side notched forms. Most commonly, the type occurs manufactured from locally available raw materials. Because of the type's small size, much of the raw material may have originated as glaciofluvial pebbles or cobbles. Based on the literature review, use of exotic material in Kiski Notched production is rare, though Petraglia et al. (1992b:238) report a Flint Ridge example from Site 36BV238.

Table 3.98. Study Collection Jack's Reef Corner Notched and Pentagonal Projectile Point Summary Data

Type	Site	Object Length	Blade Length	Blade Width	Stem Width	Thickness (Blade)	Chert Type	Appendix D Figure #
Corner Notched	36BV14	28.88	17.81	16.85	15.53	6.76	Ohio Flint Ridge (OFR)	D46
Corner Notched	36BV24	21.67	15.75	21.72	18.12	5.08	Cochocton	D62
Corner Notched	36BV24	25.26	18.27	31.04	24.04	6.03	Onondaga	D62
Corner Notched	36BV24	28.77	22.65	23.91	15.68	5.47	Onondaga	D62
Corner Notched	36BV24	60.71	23.32	26.53	23.58	4.37	Cochocton	D62
Pentagonal	36AL6	39.0	24.0	24.4	21.0	7.4	Onondaga	D1
Pentagonal	36BV11	45.44	28.56	23.29	17.07	8.07	unidentified	D39
Pentagonal	36BV14	32.29	24.06	27.27	21.63	6.00	unidentified	D46
Pentagonal	36BV21	35.37	31.33	24.43	14.33	6.09	unidentified	D50

The Kiski Notched and Stemmed examples recognized in the study collections included three fragments (bolded and italicized in Table 3.99 below). The fragments from Site 36AL62 were both resharpened.

Table 3.99. Study Collection Kiski Notched and Stemmed Projectile Point Summary								
Type	**Site**	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Chert Type**	**Appendix D Figure #**
Notched	36AL6	23.1	16.5	15.7	17.7	5.2	unidentified	D2
Notched	36AL62	***16.9***	9.0	15.7	18.5	4.2	unidentified	D12
Notched	36AL62	***19.0***	12.3	15.9	18.4	5.3	unidentified	D12
Notched	36AL62	21.2	16.5	13.5	11.2	5.7	unidentified	D10
Notched	36AL480	27.70					Onondaga	D26
Notched	36BV3	21.07	13.96	17.45	17.82	4.72	unidentified	D30
Notched	36BV3	21.71	14.89	15.61	12.74	5.22	unidentified	D30
Notched	36BV3	27.04	21.04	15.50	10.93	5.78	unidentified	D28
Notched	36BV10	23.01	17.39	20.01	11.63	5.00	unidentified	D36
Notched	36BV21	21.27	15.77	16.55	12.85	5.58	unidentified	D50
Notched	36BV22	25.78	21.67	18.82	9.06	5.00	unidentified	D58
Notched	36BV22	26.79	21.93	16.58	11.46	5.47	unidentified	D58
Notched	36BV24	22.56	19.11	***12.45***	***8.61***	3.51	unidentified	D61
Notched	36BV26	26.92	21.56	21.25	11.51	5.71	unidentified	D67
Notched	36BV38	20.42	14.76	15.91	12.74	4.78	unidentified	D69
Stemmed	36BV38	20.9		18.3		5.8	local pebble	D70

The Kiski projectile point raw materials, for the most part, are unidentified as to source. Although the cherts are unidentified, the colors 5YR4/1 brownish gray and 10YR6/2 pale brownish yellow (Table 3.100) are associated with Onondaga chert examples in the study collection. The italicized and bolded measurements on the two examples from Site 36AL62 represent measurements on resharpened items.

Table 3.100. Study Collection Kiski Notched Raw Material Colors				
Type	**Site**	**Object Length**	**Material**	**Color**
Kiski Notched	36AL6	23.1	Chert, unidentified	10R7/4: Moderate Orange Pink
Kiski Notched	36AL62	***16.9***	Chert, unidentified	5YR4/1: Brownish Gray
Kiski Notched	36AL62	***19.0***	Chert, unidentified	5YR4/1: Brownish Gray
Kiski Notched	36AL62	21.2	Chert, unidentified	5YR4/1: Brownish Gray
Kiski Notched	36AL480	27.70	Chert, Onondaga	10YR6/2 pale yellowish brown
Kiski Stemmed	36BV38	20.9	Chert, local pebble	10YR6/2 pale yellowish brown

Manker Stemmed and Manker Corner Notched (Table 3.101) examples in the study collection included four fragmentary and/or modified items (highlighted on Table 3.101 below). The Site 36AL62 artifact has a broken haft. The highlighted artifacts from Sites 36BV3 and 36BV13 are both resharpened. The point from 36BV11 has a fragmented stem.

Table 3.101. Study Collection Manker Corner Notched and Stemmed Projectile Point Summary Data								
Type	**Site**	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Chert Type**	**Appendix D Figure #**
Manker Corner Notched	36BV11	53.51	40.99	28.59	24.34	6.40	Ohio Flint Ridge	D39
Manker Corner Notched	36BV22	50.66	41.86	20.70	17.27	8.16	Ohio Flint Ridge	D58
Manker Corner Notched	36BV24	38.32	28.79	20.60	20.63	11.98	unidentified	D61
Manker Stemmed	36AL62	54.3	39.7	26.0		8.4	unidentified	D21
Manker Stemmed	36BV3	29.92	19.74	22.42	19.64	6.89	Ohio Flint Ridge	D29
Manker Stemmed	36BV3	31.28	21.06	18.39	16.83	6.42	unidentified	D30
Manker Stemmed	36BV3	***33.61***	13.95	26.60	22.54	8.23	unidentified	D30
Manker Stemmed	36BV3	33.76	23.01	18.00	11.04	6.18	Ohio Flint Ridge	D28
Manker Stemmed	36BV3	37.36	21.59	18.33	16.21	7.62	unidentified	D30
Manker Stemmed	36BV3	38.07	20.94	26.71	17.67	7.11	Onondaga	D30
Manker Stemmed	36BV3	42.68	30.00	21.36	22.23	8.40	Kanawha	D29
Manker Stemmed	36BV3	44.30	26.70	22.68	18.70	9.32	unidentified	D30
Manker Stemmed	36BV3	60.43	19.35	20.01	17.35	6.10	unidentified	D29
Manker Stemmed	36BV10	37.89	23.67	18.62	13.15	7.38	unidentified	D36
Manker Stemmed	36BV10	45.92	31.57	21.32	14.28	8.34	unidentified	D36
Manker Stemmed	36BV11	37.13	22.03	20.10	***18.36***	6.64	Ohio Flint Ridge	D39
Manker Stemmed	36BV11	38.40	23.90	21.29	19.71	6.57	unidentified	D39
Manker Stemmed	36BV13	***23.72***	14.95	21.83	20.72	6.11	unidentified	D42
Manker Stemmed	36BV14	28.80	19.69	17.48	18.23	9.41	unidentified	D46
Manker Stemmed	36BV21	26.95	19.66	22.67	15.53	6.70	unidentified	D50
Manker Stemmed	36BV24	32.72	20.10	23.42	20.17	6.69	Ohio Flint Ridge	D61

Raccoon Notched projectile points are the subject of a detailed study by Lantz (1989). In the study collection, all of the identified examples were recovered from Site 36BV24 and five of the six identified examples are either fragmentary (items listed below on Table 3.102 with lengths of 23.74, 31.83, and 32.79 mm) or retouched into scrapers (items listed below on Table 3.102 with lengths of 18.80 and 20.30 mm).

Table 3.102. Study Collection Raccoon Notched Projectile Point Summary Data							
Site	**Object Length**	**Blade Length**	**Blade Width**	**Stem Width**	**Thickness (Blade)**	**Material**	**Appendix D Figure #**
36BV24	***18.80***	***9.96***	15.79	21.57	4.37	Chert, unidentified	D62
36BV24	***20.30***	***10.64***	21.15	19.64	4.41	Chert, Onondaga	D62
36BV24	22.44	14.80	18.27	3.30	3.30	Chert, unidentified	D62
36BV24	***23.74***	***16.56***	19.86	22.20	4.30	Chert, unidentified	D62
36BV24	31.83	20.73	***19.04***	20.48	5.07	Chert, Onondaga	D62
36BV24	***32.79***	23.55	24.57	21.20	4.52	Chert, Onondaga	D62

The chipped stone industry of the Middle Woodland also produced other items that should be considered as potentially diagnostic of the period. Included in this grouping are cache and lamellar blades. Both forms are recovered from mortuary and non-mortuary contexts (Mayer-Oakes 1955). The cache blades are typically oval, tear-drop, or trianguloid in shape. They are bifacially chipped and are often manufactured on high-quality cherts such as Ohio Flint Ridge. It has been posited that the cache blades were ceremonial only, were blanks, or served as specialized knife forms. McConaughy and Johnson (2003) report on their study of cache blades recovered from Sugar Run Mound (36WA359) and Village (36WA2). Low-power examination of the cache blade surfaces revealed wear patterns indicative of both "bag-wear" and use as a knife. The "bag-wear" is postulated to have occurred while the blades were stored in leather pouches or bags and as they rubbed one against the other.

Lamellar blades (also cited in the literature as lamellar bladelets and bladelets), are commonly manufactured on high-quality cherts (OFR, Vanport, and Wyandotte [Harrison County], for example). The bladelets are being removed from both common and prepared cores. The prepared bladelet cores are considered diagnostic of Hopewell (Pacheco 1997; Kozarek 1997) as are the bladelets themselves. Genheimer (1993) and Connolly (1997) both argue that the bladelets serve as multipurpose tools. They base their conclusions on both wear patterns and the preponderance of the artifact type at Hopewell habitations to the exclusion of biface, drill, and graver forms.

A final note about Middle Woodland chipped stone assemblages focuses on the persistent use of so-called exotic raw materials. In the Ohio part of the study, closer to the Hopewell heartland, the selection for high-quality chert is pandemic at Middle Woodland sites with the persistent use of OFR, Plum Creek, Vanport, and Wyandotte (Harrison County) cherts. Also occurring are Paoli chert and even extralocal obsidian. In the West Virginia and Pennsylvania parts of the study area, however, the incidence of these extralocal material types decreases dramatically. Of the suite of extralocal types, only OFR persistently appears in Middle Woodland assemblages in the two states. This decrease may reflect the relatively low incidence of "true" Hopewell occupations in the region.

Other Artifact Classes

In the study area, the minor artifact classes are represented by ground stone, pecked stone, bone and shell tools, Hopewell exotics, and ceramics. It is emphasized here that there is only a limited Hopewell presence in the study region and many of the Hopewell sites are concentrated in the Beaver Creek drainage. Hopewell artifacts occur with some regularity on non-Hopewell Middle Woodland sites in the study area but they never appear to assume majority status in any assemblage.

Middle Woodland ground and pecked stone assemblages in the study area do not differ in content from Early Woodland ones. As far as can be determined, there are no ground stone or pecked tools that are indicative exclusively of the Middle Woodland era. The ground and pecked stone suite includes axes, adzes, celts, gorgets, mullers, netsinkers, pestles, and mortars. The axes include both poll and chipped/ground forms. The former may have been used as hammers or mallets, though they do not, in illustrations, appear to be as big as earlier Archaic full and ¾-groove varieties. The chipped/ground stone axes also are small and may have been hafted for use as hoes or choppers. Their surfaces, like those of cache blades, exhibit use polish but probably not intentional grinding. Finally, Mayer-Oakes (1955:217, 219) illustrates one- and two-hole gorgets in a variety of rectangular and teardrop forms in addition to single examples of a adze, celt, and notched netsinker.

The bone and shell assemblages for the period also do not seem to have diagnostic artifact forms. Bone items are typically needles, hooks, and beads while the shell items appear to be ornaments, scrapers, or beads.

Hopewell exotics occur in both mortuary and non-mortuary contexts. Mayer-Oakes (1955:217) illustrated examples of a suite of copper objects including cylindrical and spherical beads, a crescent, an ear spool, an awl, a button, a hemisphere, and a celt. Also shown is a silver panpipe band and various pieces of cut mica. Sheet mica, both cut and uncut, also was recovered from the Sugar Run Mound (36WA359) and Village (36WA3) burials.

The ceramics of the Middle Woodland are unremarkable in form and decoration. The latter is typically cordmarked and there is some variation in cordmarked direction, thickness, and twist direction. The early phase of the period is marked by the presence of grit-tempered Mahoning Ware (Mayer-Oakes 1955). This type may co-occur with older McKees Rock or Adena plains. The Mahoning Ware continues well into the period but does not appear to ever form the majority type at a site. Rather, limestone tempered Watson series ceramics is the dominant ware in the period.

Watson series ceramics were first described by Dragoo (1956:64-65, 1971c) based on materials recovered during his excavations at the Watson Site (46HK34) in Hancock County, West Virginia. The series includes exterior cordmarked and interior smooth and exterior / interior cordmarked types that are marked by straight and excurvate folded and / or collared rims. Lugs are present and include mammiform types which are likely more decorative than functional as they would be difficult to grasp because of their size. The limestone temper is

not uniform in size and appears as "a coalition of angular granules in conglomerate" (Buker 1993:26).

Research Issues – Middle Woodland

Middle Woodland research issues based on the current study are focused in four areas: chronology, settlement systems, subsistence processes, and trait discrimination. Although it is apparent that Hopewell influences and settlement occur in the study region, it also is apparent that an indigenous population continues to be dominant in the Pennsylvania portion of the study region. This indigenous base appears to have operated in much the same way as it did during the preceding Early Woodland. Thus, the questions focus on how to discriminate hallmark traits for both the indigenous and Hopewell populations.

The first issue focuses on chronology. There is a dearth of radiocarbon dates and the postulated chronology for the period cannot be confirmed or denied. The primary research chronology issue is the same as it was for the Early Woodland period.

- Are the Middle Woodland beginning and ending dates little more than general markers which vary from valley to valley within the study area? If this is the case, what does this imply about the rates of culture change and the influences which lead to culture changes in the study area?

Similarly, while there is documented Hopewell influence in the Middle Woodland period occupations of western Pennsylvania, it remains unclear if the period is marked by an actual Hopewell population movement into the area. If, indeed, the Hopewell moved into the study region, then sites with clearly defined Hopewell intra-site characteristics should be present. This, however, does not appear to be the case, though some Hopewell site elements are present. Among these are stone crypt mounds (Cowin 2003; McConaughy and Johnson 2003). At this point, however, there is no recognition of Hopewell hamlets in other than the Ohio portion of the study area. Thus, the research questions focus on defining bases for discriminating between indigenous and Hopewell non-ceremonial site types. The research avenues pertinent to these issues and settlement strategies in general include the following.

- Pacheco (1988) posited four criteria for the discrimination of Hopewell hamlets. The criteria are (1) site size; (2) structural redundancy; (3) limited tool variability; and (4) clustered proximity to earthworks and/or mounds. Using the PASS (Subbasin 20) UTM data, are Middle Woodland small habitation sites located in a patterned way relative to either earthworks or mounds?

- Following along the same conceptual path, do the Middle Woodland small habitation sites display internal characteristics similar to Hopewell hamlets as described by Pacheco (1988, 1997) and Kozarek (1997)?

Subsistence data for the Middle Woodland in the study area differs from the preceding Early Woodland strategms in few substantive ways. One of the most substantive departures, however, involves the use of greater numbers of corn varieties. If more corn

varieties are being used, are there resultant implications for site location strategies or feature forms. The following research questions are pertinent to this issue.

- Identified Middle Woodland feature types do not appear to include notable numbers or types of storage pits. Is it axiomatic that increased use of corn will result in a broad variety of storage features? Is there any correlation between corn, its varieties, and features of any type?

- As posited for the Early Woodland, both semi-domesticates (chenopod and amaranth) and domesticates (squash and corn) are present in Middle Woodland floral assemblages. It appears that domesticates are assuming bigger roles in the subsistence economy. Yet, site locations appear to about the same as for the preceding Early Woodland. Would shifts in site settlement locations be likely if corn and squash production was more important?

The focus of attention as regards Middle Woodland artifact assemblages has tended to be on the more spectacular Hopewell manufactured or influenced items like gorgets, lamellar bladelets, and cut mica. Except for projectile points, the other Middle Woodland artifact types seem to be undistinguished and virtually interchangeable with those of both earlier and later periods. The paramount research issue follows.

- Are there artifact types in the study area which are uniquely indicative of Middle Woodland indigenous populations? Similarly, are there artifact types in the study area which are uniquely indicative of Middle Woodland Hopewell populations which do not occur in Ohio Hopewell assemblages?

Late Woodland, Late Prehistoric, and Protohistoric (A.D. 900 – A.D. 1600)

Not surprisingly, it is sites of the later years of the Woodland that are the most thoroughly investigated at the Phase II and III level in the immediate study region (for example, Boyce 1985; Buker 1970, 1993; Christine Davis Consultants, Inc. 1997; Church 1994; Dragoo 1971a, 1971b; Dzodin and Resnick 1993; George 1982, 1992a, 1992b, 1995, 1998; George and Fischer 1999; George et al. 1990; George and George 1998; George and Scaglion 1992; Henderson 1978; Matlack 2000). For the most part, these site investigations have focused on Monongahela hamlets and villages, though other Late Woodland / Late Prehistoric manifestations are present in the study region and in its near environs. To set the stage for the following discussions, the study area cultural groups are characterized. This synopsis is followed by short discussions of nearby cultural groups.

The Late Woodland / Late Prehistoric continuum in the study area is divided into a series of cultures and phases. For the purpose of this discussion, a core area has been defined as encompassing the upper Ohio River, upper and lower Youghiogheny, lower Monongahela, upper and lower Conemaugh, and lower Kiskiminetas drainages. The western study area is defined as west of the Ohio River on the escarpment of the Allegheny Plateau. The northern

study area is defined as the middle and upper Allegheny drainage and the northern glaciated Allegheny Plateau. Because of the peculiarities of the drainage pattern and topography, there is no 'southern' periphery.

The earliest of the Late Woodland phases in the core area is the Watson Farm phase. To the west, it appears that Hopewell lingers and to the north indigenous Middle Woodland remains. The early Late Woodland, ill-defined at best, is superceded by the Early Monongahela Drew phase in the core area, Cole and Belmont cultures to the west, and Mead Island, Mahoning, and Allegheny Tradition cultures to the north. By no later than about A.D. 1200, Early Monongahela Drew phase is replaced by Middle Monongahela which is classified as Late Prehistoric in the core area. The single defined Middle Monongahela phase is the Campbell Farm phase. To the west, the transition from Belmont culture to Whittlesey culture is not well defined. In the northern area, Meade Island and Mahoning cultures may be superceded or displaced by what Brose (2000:99) defines as the Glen Meyer and, subsequently, the Eastwall/McFate complexes. Others, however, define a possible French Creek phase and the better-defined McFate culture in the northern region. During the same period in northeast Ohio, the 'Allegheny Plateau Late Woodland' remains undifferentiated until the onset of the Early Whittlesey (Brose 2000:99). By Late Monongahela times, there are at least three defined phases in the core area: Foley Farm, Youghiogheny, and Johnston. To the west, Whittlesey culture is well in place. In the north, however, areas may be abandoned.

Johnson (2004) notes that the core-area phases are Watson Farm, Drew, Campbell Farm, Foley Farm, Youghiogheny, and Johnson. This suite of phases forms the corpus of Monongahela. Beginning in the late Late Woodland and continuing through Late Prehistoric and Protohistoric, the Monongahela is the major presence in both the Pennsylvania and West Virginia portions of the study area. In general, the pattern of large sites on the floodplains and terraces, and smaller sites in the uplands or along the tributaries, holds true for the Monongahela. But, excavations at sites like the Mon City Site (36WH737) indicate that small habitation loci also were present and probably interspersed among the larger villages and hamlets on the floodplains and terraces (Hart 1994). And, George (1973:34-36) concluded that the Monongahela Drew phase Ryan Site (33WM23) represented a short-term occupation sited in its relatively undesirable upland setting because of "territorial population pressures" (George 1973:36). His reasons for postulating population pressure are not articulated.

The differences between the Monongahela phases are based largely on ceramics, hamlet and village size and composition, and the relative degree of reliance upon domesticated plants. Monongahela as a cultural construct is defined on the bases of: (1) shell and limestone tempered ceramics; (2) cannel coal pendants; (3) maize-based horticulture; (4) semi-subterranean, enclosed storage facilities; and (5) placement of stockaded villages in upland settings away from major river valleys (Nass and Hart 2000:124).

To the west, the Cole and Whittlesey cultures are not linked one to another and occupy either the southeast (Cole) or northeast (Whittlesey) areas of Ohio. The Cole phase (also referred to as Cole complex, Cole horizon, and Cole-Baldwin) was defined by Baby and

Potter (1965) who assigned it to the Late Woodland in southeastern Ohio. It is actually the earliest of a series of phases in the region, including the contemporaneous Peters phase and the subsequent Chesser phase, that are virtually valley specific and defined on minor differences in ceramic assemblage. Johnson et al. (1989) also postulate a Belmont phase which is based on a grouping of Late Woodland / Late Prehistoric sites, including the Tower Site (33BL15) in Belmont County, Ohio. This phase, too, is defined on ceramics, in this case motifs and a cordage manufacturing tradition as exhibited on the ceramics (Johnson et al. 1989:26-27).

The Cole phase apparently is defined almost exclusively on the presence of Cole Cordmarked which, in turn, is distinguished by grit tempering, cordmarked exteriors, and flattened, appliquéd, or slightly collared lips (Murphy 1989:233). Murphy (1989:234, 241) notes the presence of the incised curvilinear guilloche on a small sample of Cole Cordmarked sherds. This design element is traditionally associated with Fort Ancient ceramics and its appearance in the Late Woodland Cole context is taken as evidence that the design element developed *in situ* and not farther south (Murphy 1989).

Brose's (2000) introduction of the 'Allegheny Plateau Last Woodland' construct has not clarified the transition. Brose (1973) summarized the early research that led to the definition of the Late Woodland / Late Prehistoric Whittlesey Focus. Except for some sites in the Ashtabula County vicinity of the study area, Whittlesey Focus groups do not appear to enter the Pennsylvania side of the study area. There are obvious similarities between Whittlesey Focus occupations and Fort Ancient ones to the southwest, and Iroquoian ones to the northeast. The shared traits were noted by Griffin (1966:237):

Traits most closely related to the Iroquoian culture are stone adze blades, knobbed chipping tools of bone or antler, notched stone net sinkers, long-stemmed, elbow pipes, flint scrapers (particularly in the western Iroquoian division), flexed burials, and fortified sites on promontories. Traits most closely related to Fort Ancient are celts with pointed polls, cylindrical chipping tools of antler, flint drills with expanded bases, bone flutes, stone gorgets, perforated and worked mussel shells, leaf-shaped and notched flint projectile points, large bone or antler punches, and extended burials. Traits present and characteristic of all three areas are split-bone awls, bone beads, hollowed deer phalanges, rectanguloid celts, unbarbed fishhooks, grooved sandstone abrading stones, leaf-shaped knives, concoidal stone pipe bowls, triangular and leaf-shaped points with narrow bases, and socketed antler arrow points.

Brose (1994), using data recovered during the South Park excavations, provides detail on the three Whittlesey Focus phases: Hale/Riverview (A.D. 1050-1250), Vaughn (A.D. 1350-1500), and South Park (A.D. 1500-1650). The temporally defined phases also are differentiated from one another on the bases of house forms, ceramic decoration, and minor stone tool, ceramic pipe, and bead traits (Brose 1994:172; Table 12.3). As regards houses, the structures begin as circular, single-set post houses and, by the Vaughn phase, have changed to elliptical to sub-rectangular, double-row post houses. Certain feature forms such as the so-called turtle pits appear in the Vaughn phase and continue into the South Park

phase. This feature form, in particular, is shared with the Monongahela (Mayer-Oakes 1955, Brose 1994).

In the north and northwest, the Mead Island, Mahoning, Allegheny Tradition, and McFate cultures were present at varying times during the Late Woodland / Late Prehistoric. Their presence within and at the edges of the Monongahela-dominated core area suggests that Monongahela may actually be one among a series of adaptive responses that were at play in the region. The Mead Island, Mahoning, and Allegheny Tradition cultures are defined on the bases of limestone and grit temper ceramics which emulate both Monongahela and Whittlesey forms; deep, cylindrical storage pits; and powdered hematite in graves (Allegheny Tradition) (Burkett 1999; Herbstritt 1981a; Nass and Hart 2000). The terminal Late Prehistoric culture in this suite is McFate Tradition (also McFate culture, McFate phase) that was originally defined on the basis of a series of sites in Clearfield County on the upper West Branch of the Susquehanna. Contact period artifacts, mostly in the form of iron goods, have been recovered from these sixteenth and seventeenth century sites. Matlack (1992) postulates that McFate projectile point, pipe, and ceramic styles are illustrative of a blending of Monongahela and Shenks Ferry traits.

Outside of the study area, certain cultures of the same time period exert influence upon the study area. To the east of the Plateau divide, in the upper Potomac drainage, along the Juniata River, and throughout the upper and middle Susquehanna drainages, the Montgomery Focus, Clemson Island, and Owasco cultures dominate (Stewart 1994:18-22). These entities begin to develop in late Middle Woodland times and they share common links at least in ceramic technology. Stewart (1994:18) notes "the use of grit temper, common vessel forms, and the use of cordwrapped stick or dowel decorations". He also notes a relationship between these eastern cultural groups and Late Woodland / Late Prehistoric Monongahela. The relationships have been most easily defined based on similarities in ceramic traits. For example, there are obvious stylistic similarities between the collared Montgomery Focus Shepard wares and various collared Late Woodland / Late Prehistoric Monongahela types.

The Montgomery Focus was not initially well defined (Schmitt 1952) and remains elusive even today. It is defined primarily on its incised, Shenks Ferry-like ceramics, villages with defensive stockades, and maize agriculture. The focus is centered in the Great Valley of eastern Maryland and southeastern Pennsylvania. Its importance to the study area lies in obvious similarities between Monongahela, Montgomery Focus, and Shenks Ferry ceramics during the middle and late Monongahela phases (Custer 1986, Schmitt 1952).

The Clemson Island culture was defined in the middle Susquehanna River valley and is widespread throughout that drainage and across the central and eastern parts of the Appalachian Plateau. The culture is marked by small hamlets, a mound and bundle burial mortuary complex, incised/punctuate/cordmark grit tempered ceramics, horticulture, and relatively non-descript chipped, and ground and pecked stone technologies. There is a linear relationship between Clemson Island and Owasco. The latter supersedes Clemson Island in all its territory and is well defined in central New York as well, where its linear antecedent is

Kipp Island phase. The differences between Clemson Island and Owasco are focused in ceramic motifs and hamlet/village layouts (Custer 1986; Ritchie 1980; Stewart 1994).

Cultural Chronology

Cowin's (1985) Late Woodland (A.D. 900-1600) subsumes within it Mayer-Oakes (1955) Late Prehistoric construct and it includes the so-called Protohistoric era. Her reasons for this deal primarily with a continuation of artifact traits through the period. The somewhat arbitrary elimination of the Late Prehistoric from the sequence reflects the general absence in the area of such Mississippian-influenced cultures as Fort Ancient. Although investigators argue that Monongahela is Mississippian influenced (see George 1995; also, discussion above), such a relationship, if any, is profoundly diluted via passage through Fort Ancient. Whichever might be the case, the discussion herein integrates the Late Woodland with the Late Prehistoric and the Protohistoric as the radiometric assays for these three constructs overlap significantly (see Appendix I).

The difference between Cowin's (1985) and Nass and Hart's (2000) temporal assignations for the Middle Woodland and Late Woodland is carried over into the Late Woodland / Late Prehistoric continuum as well. Nass and Hart (2000:125) choose to assign their Late Prehistoric construct to about the same time period as Cowin's (1985) Late Woodland manifestation. This, again, only points to the conceptual overlap between the two constructs. Nass and Hart (2000:125) further subdivide their Late Prehistoric period into three "intervals: A.D. 1000-1200, A.D. 1200-1400, and post A.D. 1400"; this, however, is done simply for comparative purposes though their discussion certainly indicates that changes in site settlement strategies occur in each of the subdivisions.

To the northwest of the study area, the somewhat generalized 'Allegheny Plateau Late Woodland' holds sway by about A.D. 850 continuing to about A.D. 1150. In the upper Allegheny of northwest Pennsylvania, the Late Woodland gives way to the Glen Meyer (A.D. 1150 to about A.D. 1450) and, subsequently, the so-called Eastwall/McFate complexes (A.D. 1450 to about A.D. 1650) (Brose 2000:99). During the same period, in northeast Ohio, the 'Allegheny Plateau Late Woodland' remains undifferentiated until the onset of the Early Whittlesey about A.D. 1350 (Brose 2000:99).

Absolute dates for this final period in the prehistory of the region are plentiful (Appendix E; see also Nass and Hart 2000:132-133, Table 4:1). Absolute dates ranging from about A.D. 920 (George 1993; 1030±80, GAK-5150) to as late as A.D.1631 (Hart 1994; 330+50, Beta 15820) confirm the extent of the Late Woodland / Late Prehistoric presence in the region.

Site Settlement Patterns

In sheer numbers, the Late Woodland / Late Prehistoric suite of sites and components in the study region is only barely larger than that of the Late Archaic/Terminal Archaic suite. The subset of 81 Late Woodland / Late Prehistoric sites within 100 m of a permanent river is presented on Table 3.103. The components in the Late Woodland / Late Prehistoric sample

engage the same sets of topographic settings as in earlier Woodland periods primarily because many of the components are part of multi-component sites. The lack of discrete occupations even at this late stage makes it difficult to determine from the study sample whether or not Nass and Hart's (2001) proposed coalescence is occurring or not.

Table 3.103. PASS (Subbasin 20) Late Woodland/Late Prehistoric Components Within 100 m of Permanent River

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36AL6	Earthwork	F	Ohio River	60	Chartiers Creek	520	Rise on floodplain	Late Woodland (collection examination)
36AL39	Open habitation	F	Ohio River	90	Chartiers Creek	100	Floodplain	Late Woodland
36AL40	Open habitation	F	Ohio River	100	Chartiers Creek	180	Floodplain	Late Woodland
36AL62	Village (Including Historic Indian)	F	Ohio River	80	Chartiers Creek	360	Hill Ridge/ Toe	Late Woodland (collection examination and PASS)
36AL73	Open habitation	F	Ohio River	40	Chartiers Creek	140	Floodplain	Late Woodland
36AL128	Open habitation	F	Ohio River	30	Chartiers Creek	430	Terrace	Late Woodland
36AL135	Open habitation	F	Ohio River	60	Chartiers Creek	120	Terrace	Late Woodland
36AL158	Open habitation	G	Ohio River	100	Sewickley Creek	140	Lower Slopes	Late Woodland
36AL201	Open habitation	G	Ohio River	0	Sewickley Creek	140	Stream Bench	Late Woodland
36AL321	Open unknown function	F	Ohio River	25	Chartiers Creek	250	Terrace	Late Woodland
36AL480	Open habitation (not listed in PASS 2001)	G	Ohio River	0	Ohio River	0	Floodplain and terraces	Late Woodland
36BT45	Open unknown function >20m radius	C	Ohio River	90	Beaver River	400	Terrace	Late Woodland
36BT324	Rock Shelter/ Cave	C	Slippery Rock Creek	100	Other	420	Middle Slopes	Late Woodland
36BV2	Open habitation	B	Ohio River	10	Not completed	400	Floodplain	Late Woodland
36BV4	Village	B	Ohio River	0	Beaver River	50	Terrace	Late Woodland (collection examination)
36BV11	Unknown, Surface Scatter <20M Radius	D	Ohio River	40	Raccoon Creek	40	Hilltop	Late Woodland (collection examination)
36BV14	Open habitation	D	Ohio River	60	Raccoon Creek	180	Floodplain	Late Woodland (collection examination)

Table 3.103. PASS (Subbasin 20) Late Woodland/Late Prehistoric Components Within 100 m of Permanent River (continued)

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36BV36	Open habitation	D	Ohio River	80	Raccoon Creek	120	Terrace	Late Woodland
36BV76	Open surface scatter <20m radius	D	Ohio River	40	Raccoon Creek	80	Terrace	Late Woodland
36BV77	Open surface scatter <20m radius	B	Ohio River	70	Beaver River	180	Hill Ridge/ Toe	Late Woodland
36BV78	Village (Including Historic Indian)	D	Ohio River	100	Raccoon Creek	160	Floodplain	Late Woodland
36BV86	Open habitation	D	Ohio River	60	Raccoon Creek	160	Floodplain	Late Woodland
36BV156	Open surface scatter <20m radius	C	Slippery Rock Creek	40	Brush Creek	60	Floodplain	Late Woodland
36BV180	Open habitation	D	Ohio River	40	Raccoon Creek	80	Floodplain	Late Woodland
36BV187	Open habitation	C	Slippery Rock Creek	60	Brush Creek	60	Floodplain	Late Woodland
36BV194	Rock Shelter/ Cave	B	Ohio River	0	Beaver River	240	Stream Bench	Late Woodland
36BV202	Open habitation	D	Ohio River	40	Raccoon Creek	180	Floodplain	Late Woodland
36BV213	Village (Including Historic Indian)	D	Ohio River	60	Raccoon Creek	400	Terrace	Late Woodland
36BV248	Open habitation	D	Ohio River	0	Raccoon Creek	50	Terrace	Late Woodland
36BV250	Open unknown function >20m radius	D	Ohio River	20	Raccoon Creek	80	Floodplain	Late Woodland
36BV295	Open unknown function	C	Slippery Rock Creek	80	Connoquen-essing Creek	450	Hillslope	Late Woodland
36BV305	Open unknown function	B	Ohio River	40	Not completed	350	Rise in Floodplain	Late Woodland
36CW26	Earthwork	A	Shenango River	0	Neshannock River	0	Terrace	Late Woodland
36CW298	Open habitation	A	Shenango River	60	Neshannock River	60	Floodplain	Late Woodland
36CW323	Open habitation	A	Shenango River	100	Neshannock River	120	Terrace	Late Woodland
36CW335	Open surface scatter <20m radius	A	Shenango River	0	Neshannock River	0	Not completed	Late Woodland
36CW336	Open surface scatter <20m radius	A	Shenango River	0	Neshannock River	0	Not completed	Late Woodland
36CW340	Open surface scatter <20m radius	A	Shenango River	0	Neshannock River	0	Not completed	Late Woodland

Table 3.103. PASS (Subbasin 20) Late Woodland/Late Prehistoric Components Within 100 m of Permanent River (continued)

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36CW344	Open surface scatter <20m radius	A	Shenango River	0	Neshannock River	0	Not completed	Late Woodland
36GR52	Village (Including Historic Indian)	E	Ohio River	10	Wheeling Creek	40	Floodplain	Late Woodland
36GR123	Open habitation	E	Ohio River	20	Wheeling Creek	100	Floodplain	Late Woodland
36GR172	Village (Including Historic Indian)	E	Ohio River	0	Wheeling Creek	40	Floodplain	Late Woodland
36GR196	Rock Shelter/ Cave	E	Ohio River	30	Wheeling Creek	110	Hillslope	Late Woodland
36GR201	Open habitation	B	Mononga-hela River	0	Wheeling Creek	640	Floodplain	Late Woodland
36LR3	Open unknown function >20m radius	B	Ohio River	10	Mahoning River	150	Floodplain	Late Woodland
36LR13	Open unknown function >20m radius	A	Shenango River	20	Neshannock River	60	Floodplain	Late Woodland
36LR150	Unknown Function Open Site Greater than 20M Radius	B	Ohio River	60	Mahoning River	280	Floodplain	Late Woodland
36LR151	Open surface scatter <20m radius	B	Ohio River	60	Beaver River	170	Hill Ridge/ Toe	Late Woodland
36LR165	Open unknown function >20m radius	B	Ohio River	100	Mahoning River	130	Floodplain	Late Woodland
36LR186	Open Prehistoric Site, Unknown Function	D	Allegheny River	0	Mahoning Creek	240	Floodplain	Late Woodland
36LR193	PASS coded as Historic and Prehistoric	B	Ohio River	0	Mahoning River	0	Saddle	Late Woodland
36ME13	Open habitation	A	Shenango River	80	Neshannock River	130	Floodplain	Late Woodland

Table 3.103. PASS (Subbasin 20) Late Woodland/Late Prehistoric Components Within 100 m of Permanent River (continued)

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36ME76	Open surface scatter <20m radius	A	Shenango River	100	Neshannock River	150	Floodplain	Late Woodland
36ME79	Open surface scatter <20m radius	A	Shenango River	60	Neshannock River	200	Floodplain	Late Woodland
36WH74	Open unknown function	F	Ohio River	0	Chartiers Creek	200	Stream Bench	Late Woodland
36WH76	Open unknown function	F	Ohio River	10	Chartiers Creek	20	Floodplain	Late Woodland
36WH274	Village (Including Historic Indian)	F	Ohio River	0	Chartiers Creek	80	Terrace	Late Woodland
36WH283	Village (Including Historic Indian)	F	Ohio River	60	Chartiers Creek	120	Terrace	Late Woodland
36WH303	Open habitation	F	Ohio River	60	Chartiers Creek	60	Terrace	Late Woodland
36WH338	Isolated Find	D	Ohio River	30	Raccoon Creek	140	Middle Slopes	Late Woodland
36WH408	Open habitation	D	Ohio River	60	Raccoon Creek	460	Lower Slopes	Late Woodland
36WH409	Open unknown function >20m radius	D	Ohio River	50	Raccoon Creek	360	Middle Slopes	Late Woodland
36WH410	Open habitation	D	Ohio River	10	Raccoon Creek	410	Stream Bench	Late Woodland
36WH550	Open habitation	D	Ohio River	20	Other	100	Terrace	Late Woodland
36WH664	Open habitation	F	Ohio River	0	Chartiers Creek	100	Stream Bench	Late Woodland
36WH678	Village (Including Historic Indian)	F	Ohio River	20	Chartiers Creek	160	Stream Bench	Late Woodland
36WH907	Open habitation	F	Ohio River	100	Chartiers Creek	140	Hill Ridge/ Toe	Late Woodland
36WH909	Open habitation	E	Ohio River	0	Wheeling Creek	200	Floodplain	Late Woodland
36WH963	Open unknown function	B	Monongahela River	80	Tenmile Creek	200	Saddle	Late Woodland
36WH991	Open unknown function	F	Ohio River	20	Chartiers Creek	30	Floodplain	Late Woodland
36WH999	Open habitation	E	Ohio River	0	Wheeling Creek	0	Floodplain	Late Woodland
36WH1025	Open habitation	E	Ohio River	0	Wheeling Creek	50	Floodplain	Late Woodland
36WH1060	Open unknown function	F	Ohio River	0	Chartiers Creek	80	Stream Bench	Late Woodland

Table 3.103. PASS (Subbasin 20) Late Woodland/Late Prehistoric Components Within 100 m of Permanent River (continued)

Site	Site Type	Subbasin 20 Watershed	Major Stream	Distance (m) to Major Stream	Minor Stream	Distance (m) to Minor Stream	Topographic Setting	Period
36WH1071	Open Prehistoric Site, Unknown Function	F	Ohio River	40	Chartiers Creek	180	Hill Ridge/ Toe	Late Woodland
36WH1098	Open unknown function	F	Ohio River	25	Chartiers Creek	100	Floodplain	Late Woodland
36WH1099	Open unknown function	E	Ohio River	0	Buffalo Creek	10	Floodplain	Late Woodland
36WH1113	Lithic Reduction	F	Ohio River	60	Chartiers Creek	200	Terrace	Late Woodland
36WH1118	Lithic Reduction	F	Ohio River	100	Chartiers Creek	160	Terrace	Late Woodland
36WH1153	Open unknown, >20m radius	F	Ohio River	60	Other	340	Saddle	Late Woodland
36WH1207	Open unknown function	F	Ohio River	20	Chartiers Creek	100	Stream Bench	Late Woodland

The PASS (Subbasin 20) subset of Late Woodland / Late Prehistoric sites yielding diagnostic projectile points was examined for trends in settlement during the period (Table 3.104). In the database, 124 sites had diagnostic projectile points. Of the total, six sites with triangular points had no listed topographic data and these are not included in Table 3.104.

Table 3.104. PASS (Subbasin 20) Late Woodland / Late Prehistoric Landform, Topographic Setting, and Projectile Point Summary

Association	Topographic Setting	Associated Projectile Points	N=	% of Base N=
Lowland	Floodplain	Backstrum	1	
		Backstrum, Chesser Notched, Triangles (PASS)	1	
		Chesser Notched, Hamilton Incurvate, Madison	1	
		Triangles	37	
	Rise on Floodplain	Levanna, Madison	2	
		Triangles	2	
	Terrace	Madison	1	
		Triangles	24	
Lowland N=			**69**	**58.5**
Upland	Hill Ridge/ Toe	Levanna, Madison, Madison drill, Madison preform, Chesser Notched	1	
		Triangles	12	
	Hillslope	Triangles	3	
	Hilltop	Madison	1	
		Triangles	5	
	Lower Slopes	Triangles	1	
	Middle Slopes	Triangles	4	
	Ridgetop	Triangles	2	
	Saddle	Triangles	5	
	Stream Bench	Triangles	12	
	Upland Flat	Triangles	1	

Table 3.104. PASS (Subbasin 20) Late Woodland / Late Prehistoric Landform, Topographic Setting, and Projectile Point Summary				
Association	**Topographic Setting**	**Associated Projectile Points**	**N=**	**% of Base N=**
	Upper Slopes	Triangles	2	
Upland N=			**49**	**41.5**
Base N=			**118**	**100.0**

Of interest in the distribution data is the ubiquitous dispersal across the landscape of Late Woodland / Late Prehistoric triangles of various types. Recovered from all settings, the distribution of the triangles is in some contrast to the stemmed forms like the Chesser Notched and Backstrum. These point types, with admittedly low numbers, are seemingly concentrated at floodplain sites. The possible reasons for such concentration are unknown as the preceding Middle Woodland sites were certainly distributed across most available landforms also. A larger sample of Chesser Notched and Backstrum site locations might clarify the picture.

Based on the Table 3.104 data, 76.3% (n=90) of the Late Woodland / Late Prehistoric components occur in one of four topographic settings: floodplains (n=40), terraces (n=25), hill ridge/toes (n=13), and stream benches (n=12). For the first time in any period in the study area, most of the sites are located in lowland settings. Several conclusions can be drawn from this shift in setting preference: (1) the shift results from increasing dependence on agricultural production with its accompanying needs for stable water supplies and fertile, annually replenished soil; (2) the lowlands, in general, afford larger expanses of level land in close proximity to potable water; (3) the lowlands, in general, offer a broader array of natural resources than do the uplands; and (4) the lowlands, in general, offer better climatic conditions than do the uplands. The conditions outlined for Items 2, 3, and 4 would be applicable in any time period. It is only the conditions outlined in Item 1 that are significantly different from earlier periods by Late Woodland / Late Prehistoric times.

These conclusions are supported, to a degree, by the results of a comparison of landform, topographic setting, and site type (Table 3.105). The Table 3.105 sample consists of 123 Late Woodland / Late Prehistoric components with complete data in each of the three fields. The comparison does not particularly support a contention that particular site types are concentrated in particular settings though the comparison shows that, with one exception, all of the village sites are located in well-watered lowland or upland settings. This suggests that these focal points may be the apex of a larger, more dispersed settlement network.

Table 3.105. PASS (Subbasin 20) Late Woodland / Late Prehistoric Landform, Topographic Setting, and Site Type Associations				
Landform	**Topographic Setting**	**Associated Site Types**	**N=**	**% of Base N=**
Lowland	Floodplain	Open habitation	22	
		Open surface scatter <20m radius	3	
		Open unknown function >20m radius	8	
		Open, unknown function	5	
		Village	5	
	Floodplain and terraces	Open habitation	1	
	Rise on floodplain	Earthworks	1	

		Open habitation	2	
		Open, unknown function	1	
	Terrace	Earthwork	1	
		Lithic Reduction	2	
		Open habitation	12	
		Open surface scatter <20m radius	1	
		Open unknown function	2	
		Open unknown function >20m radius	1	
		Village	5	
Lowland N=			**72**	**58.5**

Table 3.105. PASS (Subbasin 20) Late Woodland / Late Prehistoric Landform, Topographic Setting, and Site Type Associations (continued)

Landform	Topographic Setting	Associated Site Types	N=	% of Base N=
Upland	Hill Ridge/ Toe	Open habitation	8	
		Open surface scatter <20m radius	2	
		Open, unknown function	2	
		Village	2	
	Hillslope	Open habitation	1	
		Open, unknown function	1	
		Rock Shelter/ Cave	1	
	Hilltop	Open habitation	2	
		Open surface scatter <20m radius	1	
		Open unknown function >20m radius	1	
		Open, unknown function	2	
	Lower Slopes	Open habitation	2	
	Middle Slopes	Isolated Find	1	
		Open unknown function >20m radius	1	
		Rock Shelter/ Cave	1	
	Ridgetop	Lithic Reduction	1	
		Open, unknown function	1	
		Village	1	
	Saddle	Open habitation	1	
		Open unknown function >20m radius	1	
		Open, unknown function	3	
	Stream Bench	Open habitation	6	
		Open unknown function	1	
		Open, unknown function	3	
		Rock Shelter/ Cave	1	
		Village	1	
	Upland Flat	Open unknown function >20m radius	1	
	Upper Slopes	Open habitation	2	
Upland N=			**51**	**41.5**
Base N=			**123**	

House, Structure, and Feature Forms

By looking at the setting and internal structure of several of the Monongahela sites investigated to date, a picture of their settlement responses develops. Means (2000), working with data from the 1934 to 1940 Somerset County Relief Excavations, focused his attention on Monongahela Sites 36SO1 (Peck No. 1), 36SO2 (Peck No. 2), and the internal structure of the villages found at both sites, each located in terrace settings. Site 36SO1 is a single occupation palisaded village, while Site 36SO2 experienced two occupations resulting in

overlapped palisade outlines. Present within each palisade was round- to oval-shaped house outlines that were arranged "around open plaza areas." (Means 2000:44).

The Howarth-Nelson Site (36FA40) is located in a "portion of a saddle...directly on the drainage divide between Dickerson Run and a small unnamed tributary of the Youghiogheny River" (Adovasio et al. 1990:33). Located within the area of potential effect for the Texas Eastern Gas Pipeline System project, the area of the site investigated covered about 2710 m^2 (29,140 ft^2). Of this total, 24.6 percent of the area was stripped as part of a Phase III data recovery investigation (Adovasio et al. 1990:42).

The excavated structures at the Howarth-Nelson Site (36FA40) are typical Monongahela forms. Adovasio et al. (1990:60) characterize the houses as "roughly round with internal roof supports, central fire pits, and associated semi-detached, semi-subterranean storage features." The latter, based on Figure 16 in Adovasio et al. (1990:62), are oval, subrectangular, or horseshoe shaped and the interior postmolds are aligned along the perimeters.

The Novak Site (36FA34) is a Monongahela village that is located in a broad upland saddle just above a series of feeder springs. The site was investigated in 1978, 1982, and 1983 by field school classes under the direction of Dr. Ronald Michael (California University of Pennsylvania, California, Pennsylvania). During the course of the investigations, approximately 18 percent (n=219 m^2 [2357 ft^2]) of the site was mechanically and hand-stripped revealing four stockade lines and five whole or partial house outlines. The houses were round and oval in configuration.

Situated on an upland saddle, the Westmoreland County Ryan Site encompassed a 180- by 194-ft (55- by 59-m) "single stockade [which contained] 8 [sic] round houses" (George 1973:20). George (1973:20) characterized the central plaza as "devoid of postmolds".

According to Matlack's notes (2000), seven houses were identified within the palisade at the Clearfield County Ryan Site. The houses ranged from 20 to 30 m (66 to 98 ft) in diameter and, as appears to be common on Monongahela sites, five of the seven had appendages attached to them (Matlack 2000:72). Unlike most of these small appendage 'rooms', however, one of the five could not be entered from the house. Rather, the appendage had a door open to the plaza. Unlike the central plaza noted by George (1973) at the Westmoreland County Ryan Site, the Clearfield County Ryan Site central plaza did contain postmolds not associated with particular houses (Matlack 2000:73, Figure 1). They were relatively sparse in number, however, and most of the house exterior features appear to have been storage pits or hearths. One particularly interesting feature was described as a stone-lined pit with stratified fill. It is discussed more fully below.

Postmolds come in a variety of diameters. The postmolds revealed during the two-year long excavation at the Drew Site were standardly about 5 cm (2 in) in diameter (Buker 1970:72) and this was also the average diameter of the house postmolds at the Ryan Site (Matlack 2000:72). Patterning to the postmolds was difficult to discern, but Buker (1970:26)

noted that there were "hints of circular, oval or subrectangular structures of perhaps 25-ft diameter, or larger".

Probably resulting from better preservation, Late Woodland / Late Prehistoric feature types are well defined though not necessarily well understood. The standard non-structure feature types include earth ovens; smaller hearths; postmolds (including central supports); and storage and refuse pits of various configurations. Before discussing these various feature types, a word is warranted concerning Means (2000) study of feature distribution.

Means (2000) examined the spatial distribution of features at the Peck No. 1 and Peck No. 2 sites. He used differences in feature size and volume as the basis for discriminating patterns in the distributions. There are few conclusions concerning feature function, but the conclusions that Means (2000) reaches concerning the horizontal distribution of features are of interest. Based on the data, features were purposely placed by size at Peck No. 1 while size-based features were more evenly distributed across use-space at Peck No. 2. Means (2000) reached no particular conclusion in the article about the reasons for the distributional difference, as the focus of the article was on the use of metric data as the basis of discriminating feature types.

Earth ovens and/or large cooking pits of various types appear in the area's archaeological record from at least Late Archaic times. Late Woodland / Late Prehistoric ovens do not seem to be particularly common, but they do appear at most Monongahela villages in small numbers. Feature 80 at the Ryan Site is an example of large, stone lined pits. This feature measured 3.65 m (12 ft) north-south by 3 m (10 ft) east-west and it was about 41 cm (16 in) deep. The feature's fill was stratified; the basal level matrix included shale fragments, "a deer phalanx, a deer rib fragment, and a section of an elk mandible" (Matlack 2000:75). The base layer was covered in flat stones and the overriding stratum was black soil. The top stratum was brown soil. Nass (2002) noted that Mark Seeman had excavated a feature similar to Feature 80 at the Harness-28 Site. Seeman interpreted that feature as an outside kiln for firing pottery.

The Ryan Site also had a similar feature to Feature 80 within a house. It too was quite large, covering some 13.3 m^2 (144 ft^2) in an L-shape. This feature was not stratified but it did yield "a charred corn grain, a fragment of hickory nut shell, and an enameled inner ear from a deer skull" (Matlack 2000:75). Also recovered from pit fill were miscellaneous other artifacts including single examples of a bipitted stone, a hand hoe, and a pottery pipestem fragment, in addition to two point fragments, 118 chipped stone debitage, and 15 shell tempered sherds (Matlack 2000:75).

At the Novak Site (36FA34), in addition to palisade and house outlines, 59 other cultural features were identified. Boyce (1985:27) classifies these as oval basins; circular, post lined, stone filled, and burial pits; and hearths. Boyce (1985:32-38, Tables 2-4) presents metric data for all of the cultural features. What is perhaps most striking about the features is the low incidence, overall, of hearths (n=6) in the grouping. Given four stockade lines and at least five houses, the number of hearths suggests that processing was not an intensive

activity. Three of the hearths were within a house outline; the other three were outside although two of these were relatively close to houses.

The investigations at Howarth-Nelson (36FA40) resulted in data recovery on 168 features. Adovasio et al. (1990:44-45, Table 1) classify and quantify the features as: 17 refuse, two roasting/refuse, 13 storage, five "enclosed" storage, 10 fire, and nine grass-lined pits; six apparent houses; 16 burials; 16 burning incidents; one charcoal concentration; eight dark stains; five features with either possible basketry or grass mat; three midden remnants; and 57 features of undetermined function.

Metric data is not provided by Buker (1970) on the Drew Site's (36AL63) refuse, fire, and storage pits. However, his discussion (Buker 1970:28-29) does provide good information concerning the internal stratigraphy and contents of some of the features. While the smaller pits, measuring up to 60 cm (2 ft) in diameter by 60 cm (2 ft) deep, typically contained "a high ash and charcoal content" (Buker 1970:28), most did not yield much artifactual material. The larger pits, some reaching 90 cm (3 ft) in depth tended to have irregular boundaries that appear to have resulted from repeated uses and modifications. The interior stratigraphy of these features typically included several layers consisting of "wood ash, semisterile clay, dark organic soil, and fire-reddened earth" (Buker 1970:28).

Among the cultural remains present in the larger refuse and/or storage features were lenses or clumps of charred corn mostly consisting of kernels and bits of cob. Although Buker (1970:29) postulates that the layers of sterile or semisterile soil observed in the features probably resulted from alluvial or colluvial deposition into the abandoned or open pit, Moeller (1991) argues that such layers observed in features at other sites are purposeful. It is his position that such layers serve as sanitary controls and may actually herald shifts in feature use from storage to refuse. In whichever case, the larger Monongahela features at the Drew Site were stratigraphically consistent, suggesting that the users did not alter their use pattern of the features.

Buker (1970:29) documents two unusual conditions observed in the large refuse/storage pits. Some of the pits contained a band of shaped sandstone pieces present at a depth of about 60 cm (2 ft) within the features. The stone rings were sometimes associated with large pottery fragments, and heavy charcoal concentrations were found within the ring's center. While Buker (1970:29) does not speculate on the possible function of these rings, their possible use in ceramic firing seem unlikely as kiln or pit firing is uncommon in the United States outside of the Southwest (Sassaman 1993; Shepard 1980). The second unexpected inclusion, again in refuse pits, was the presence of "red dog" (burned slate). This residue is sometimes a by-product of coal firing, but Buker (1970:29) notes that there was no coal ash found in the features that yielded the burned slate.

In general, the Late Woodland / Late Prehistoric features defined to date in the study area include both multipurpose and specialized forms.

Subsistence and Seasonality Studies

Comprehensive discussions of subsistence strategies in the Late Woodland / Late Prehistoric are presented in Adovasio et al. (1990), Brown (1981), Buker (1970, 1993), Church (1994), Church and McDaniel (1992), Hart (1994), Holt (1993), Mayer-Oakes (1954), McWeeney (1993), Nass and Hart (2001), Raymer and Bonhage-Freund (1997). All of these publications indicate that conscious decisions were made by the Monongahela to enhance their capability for growing horticultural products. Through the period, domesticated crops take on increasingly major roles in the subsistence regime. In many instances, however, this increased reliance upon domesticated crops is implied from the proliferation of storage features rather than from high quantities of recovered remains. An exception to the latter situation is Buker's (1970:29) comment that "many of the refuse pits [at the Drew Site, 36AL62] contained quantities of charred corn, either in several-inch-thick laminations, or in large chunks or concentrations."

Brown (1981) summarized the invertebrate, vertebrate, and floral remains recovered from the Tower Site (33BL15) and his listing is particularly indicative of Late Woodland / Late Prehistoric faunal and floral assemblage characteristics. Brown (1981), as noted earlier, characterized the occupation at the Tower Site (33BL15) as indicative of early/middle Monongahela. The invertebrate remains from the site are important only because they are interpreted not as foodstuffs but as a ceramic resource. Brown (1981:73) postulates that the naiads (*Lampsilis siliquoidea*, *Elliptio dilatatus*, and *Lampsilis ovata ventricosa*) were not consumed but that their shells were used to temper the ceramics recovered from the site.

In contrast, the vertebrate remains from the Tower Site (33BL15) are residue from species exploited both for food and for materials. The faunal collection consisted of mammal, bird, reptile, amphibian, and fish bone. The assemblage was clearly dominated by elk (*Cervus canadensis*) and white-tailed deer (*Odocoileus virginianus*) remains that represented almost 51 percent of the recovered items. The most prevalent bird species, representing about 11.3 percent of the total bone, was turkey (*Meleagris gallopavo*). The minor reptile, amphibian, and fish species represented 7.5, 0.5, and 0.3, respectively, percent of the total collection. The representatives included box turtle (*Terrapene* cf. *carolina*), toad (*Bufo* spp.), and suckers (*Catostomidae*).

Brown (1981) raises an interesting point about the elk/deer ratio reported from various Monongahela sites in the region. His base data are presented below on Table 3.106 which contains reference to other report data as well.

Table 3.106. Late Woodland / Late Prehistoric Comparative Deer and Elk Percentages

Site	Reference	Deer (% of Total Deer and Elk)	Elk (% of Total Deer and Elk)
Boyle Site (36WH19)	Brown (1981:81 citing Nale 1963)	74.5	25.5
Drew Site (36AL62)	Brown (1981:81 citing Buker 1970)	98.8	1.2
Johnston Site	Brown (1981:81 citing Guilday 1955)	95.6	4.4
Mayview Ballfield Site (36AL134)	Holt (1993)	100.0	--

Table 3.106. Late Woodland / Late Prehistoric Comparative Deer and Elk Percentages			
Site	**Reference**	**Deer (% of Total Deer and Elk)**	**Elk (% of Total Deer and Elk)**
McKees Rocks	Brown (1981:81 citing Lang 1968)	96.9	3.1
Mon City Site (36WH737)	Church (1994)	99.1	0.9
Portman Site (36AL40)	Buker (1993)	97.8	2.2
Scarem Site (36WH22)	Mayer-Oakes (1954)	79.7	20.3
Tower Site (33BL15)	Brown (1981:78)	90.1	9.9

Brown's (1981) deer/elk hypothesis is as follows: elk provide more meat per individual and, thus, are preferred over deer. The relative percentages of deer to elk at these Monongahela sites suggests that preference is being given to elk when they are available. Brown (1981) suggests that availability may be linked to topographic setting with elk herds preferring sheltered, grass-covered valleys for their over-winter loci. It would be in this habitat that the elk would be most easily hunted; at other times of the year, they are solitary or in small family units and in different topographic settings.

While deer, elk, and bear remains occur in Late Woodland / Late Prehistoric assemblages with some consistency, other species are being exploited also as indicated by their presence on sites. Most commonly, the minor mammal species are beaver (*Castor canadensis*), rabbit (*Sylvilagus* spp.), raccoon (*Procyon lotor*), squirrel (*Sciurus* spp.), and woodchuck (*Marmota monax*) (Buker 1970, 1993; Church 1994; Mayer-Oakes 1954; Raber 2004). Avian bone recovery is dominated by turkey (*Meleagris gallopavo*) bone with a reduced incidence of species like ruffed grouse (*Bonasa umbellus*) (Buker 1970, 1993). Fish, amphibians, and turtles consistently appear among recovered species, and these commonly include frog (*Rana* spp.), toad (*Bufo* spp.), box turtle (*Terrapene carolina*), soft-shell turtle (*Amyda* sp, also *Trionyx* spp.), and snapping turtle (*Chelydra serpentina*). Fish species, including bass (*Micropterus* spp.), channel catfish (*Ictalurus punctatus*), drumfish (*Aplodinetus grunniens*), and sucker (*Castostomidae* spp.), have been identified (Buker 1993).

Specialized gathering/hunting camps have been documented for the period and it appears that these specific locations were annually and/or repeatedly utilized for the same purpose. Examples include Grays Landing (36FA368; Raber 1989), with its focus on fish, turtle, and mollusk harvesting, and Mykut Rockshelter (36HU143; Raber 2004), with its emphasis on deer, rabbit, turtle, and snake. It is of note that at least some of these specialized camps appear to have filled particular niches in the annual subsistence cycle. For example, Grays Landing (36FA368) is interpreted as an early spring encampment focused on the exploitation of fish and turtles in particular.

Floral elements recovered from Monongahela site reports reviewed for this study are summarized on Table 3.107 below. This listing should not be considered comprehensive because only a sample of available site reports was reviewed.

The floral assemblages are unremarkable in their contents. Except for the domesticates, any of the recovered items could easily have been found in earlier contexts. It appears that Late Woodland / Late Prehistoric peoples in the study area continued to rely on the same suite of floral materials utilized by earlier folks, though the variety in the reported species exploited seems to have decreased.

Table 3.107. Ethnobotanical Recovery from Late Woodland / Late Prehistoric Sites in the Study Area									
Site			**36BL15 (Tower Site)**	**36AL40 (Portman Site)**	**36AL124 (Mayview Depot Site)**	**36AL125 (Mayview Bend Site)**	**36AL134 (Mayview Ballfield Site)**	**36FA368 (Grays Landing)**	**36WH737 (Mon City Site)**
Reference			**Brown (1981)**	**Buker (1993)**	**Raymer and Bonhage-Freund (1998)**	**Raymer and Bonhage-Freund (1998)**	**Holt (1993)**	**Raber (1989)**	**Hart (1994)**
Scientific Name	**Common Name**	**Sample Type Reported**							
Acer spp.	maple	Charcoal					x		x
Achillea millefolium	yarrow	Seed					x		
Amaranthus spp.	amaranth	Seed					x		x
Asteracea, high spine	sunflower	Seed					x		
Carya spp.	hickory	Charcoal				x	x		x
Carya spp.	hickory	Nutshell	x		x			x	x
Chenopodium spp.	goosefoot	Seed				x	x		x
Circium spp.	thistle	Seed					x		
Diospyros spp.	persimmon	Seed					x		
Fraxinus spp.	ash	Charcoal				x			
Gallium spp.	bedstraw	Seed				x	x		
Hamamells virginiana	witch hazel	Seed					x		
Hedeoma pulegloides	pennyroyal	Seed					x		
Juglandaceae	walnut/hickory	Nutshell			x	x	x		
Juglans cinera	butternut	Nutshell					x		
Juglans nigra	walnut, black	Nutshell	x	x	x	x	x		
Morus rubra	mulberry	Charcoal							x
Myrica pensylvanica	bayberry	Seed					x		
Phaseolus vulgaris	bean, common	Bean		x					x
Platanus occidentalis	sycamore	Charcoal				x	x		x

Table 3.107. Ethnobotanical Recovery from Late Woodland / Late Prehistoric Sites in the Study Area									
Site			**36BL15 (Tower Site)**	**36AL40 (Portman Site)**	**36AL124 (Mayview Depot Site)**	**36AL125 (Mayview Bend Site)**	**36AL134 (Mayview Ballfield Site)**	**36FA368 (Grays Landing)**	**36WH737 (Mon City Site)**
Reference			**Brown (1981)**	**Buker (1993)**	**Raymer and Bonhage-Freund (1998)**	**Raymer and Bonhage-Freund (1998)**	**Holt (1993)**	**Raber (1989)**	**Hart (1994)**
Scientific Name	**Common Name**	**Sample Type Reported**							
Poacea	grass	Seed			x	x			
Polygonatum commuti	solomon's seal	Seed					x		
Polygonum erectum	knotweed	Seed				x			
Polygonum spp.	smartweed	Seed							x
Prunus americana	plum	Pit					x		x
Prunus spp.	cherry, wild	Charcoal					x		
Quercus	oak	Charcoal				x	x		x
Rhus spp.	sumac	Seed					x		
Robinia pseudoacaccia	black locust	Charcoal				x	x		
Rubus spp.	blackberry, raspberry	Seed			x	x	x		
Sambucus canadensis	elderberry	Seed				x	x		
Sassafras albidum	sassafras	Charcoal				x			
Silene spp.	catchfly	Seed					x		
Strophostyles spp.	wildbean	Bean					x		
Ulmus spp.	elm	Charcoal				x	x		x
Vitaceae spp.	grape family	Seed						x	x
Zea mays	corn	Kernel	x	x				x	x

Artifact Assemblages and Lithic Technologies

The assemblage composition from Late Woodland / Late Prehistoric sites effectively differs little from that of earlier periods. The differences do exist are related to quantity and variety. Because the Late Woodland / Late Prehistoric villages, in particular, are consistently larger than habitation sites of earlier periods, the accumulated debris is numerically larger and there is more variety in subtypes than in collections from earlier sites. In the following sections, the artifact types identified in Late Woodland / Late Prehistoric contexts are discussed. It is noted here that some of these artifact types, especially generalized ground and pecked stone forms, do not differ from those recovered in earlier periods. They are noted here because they are present in Late Woodland / Late Prehistoric collections; they are not necessarily diagnostic of this period alone.

Chipped Stone

The chipped stone assemblages of the Late Woodland / Late Prehistoric era are marked by a variety of tool types. Even a relatively small site such as the Ryan Site (Westmoreland County) yielded a chipped stone assemblage that included Madison projectile points, Ryan Notched knives (which are re-worked Archaic points), hump-backed knives, T-shape perforators, strike-a-lights, and triangular preforms.

Chipped stone raw materials include a variety of reported types. The Howarth-Nelson Site (36FA40) chipped stone assemblage contained examples of nearby Brush Creek chert in addition to Coshocton, Kanawha, Monongahela, Uniontown, and Upper Mercer cherts (Adovasio et al. 1990:49). Of the 329 Late Woodland / Late Prehistoric triangular points in the combined Howell and Marko collections examined by Henderson (1978), 34 were manufactured of the poor-quality Howell chert and the remainder (n=295) were made from nonlocal cherts including Ohio Flint Ridge. The use of Howell chert apparently is not restricted to the Howell Site (36AL100). Henderson (1978) indicates that the Balogh Site (36AL156), about 1.5 km (1 mi) from the Howell Site, also yielded Howell chert artifacts.

The raw materials were manipulated in a variety of ways to produce both expedient and formal tools. At the Howarth-Nelson Site (36FA40), biface and projectile points appear to have been manufactured on small tabular cores or on 4-6 cm (1.6 - 2.4 in) primary and secondary core trimming flakes (Adovasio et al. 1990:49). The core fragments and "much of the primary and secondary unmodified debitage suggest the use of non-standardized, opportunistic core reduction strategies employing various combinations of hard- and soft-hammer percussion techniques" (Adovasio et al. 1990:49). There was a pronounced incidence of secondary and primary flakes that displayed expedient use edge damage.

While there is pronounced diversity in tool types, the variety of projectile point styles that seemed to overwhelm the biface assemblages of earlier periods has disappeared. The Late Woodland / Late Prehistoric period is marked by the occurrence of Backstrum, Chesser Notched, Fort Ancient (in low quantities), Hamilton Incurvate, Jack's Reef Pentagonal and Corner Notched, Levanna, and Madison projectile points. In addition, Ryan Notched knives

appear to be a diagnostic artifact of the period. The Backstrum and Chesser Notched types originate very late in the Middle Woodland and are included herein with the Late Woodland assemblages. Both Jack's Reef Corner Notched and Pentagonal points begin to appear in the area during mid- to late Middle Woodland times and were discussed earlier. The other projectile points are triangular forms. Examples of all of the Late Woodland / Late Prehistoric types were present in the study collections (Table 3.108).

The Backstrum projectile point is discussed in some detail by George (1992b). The type was recovered in the early 1960s in Allegheny County at Site 36AL24 but the style's temporal affiliation was not determined at that time. George (1992b:63) reported that Dragoo recovered examples of the point at the Dixon Rockshelter (46PR6) in West Virginia. The type may co-occur with Chesser Notched points.

Table 3.108. Study Collection Late Woodland / Late Prehistoric Projectile Point Summary

Period	Type	N=
Late Woodland, Late Prehistoric	Backstrum	4
	Chesser Notched	3
	Fort Ancient	1
	Hamilton Incurvate	6
	Levanna	2
	Levanna, fragment proximal	2
	Madison	60
	Madison, fragment proximal	17
	Madison, preform	1
	Madison, drill	1
	Triangle	1
Total		**98**

Backstrum Side Notched points are characterized as "elongated, side notched…with excurvate blade edges and a flat base" (George 1992b:64). George (1992b:Tables 1-2) presents the metric data for several examples of the point recovered predominately from Sites 36AL19, 36AL24, 36WM453, and a handful of other sites in Clarion, Washington, and Westmoreland counties. Without exception, the points were all manufactured on locally available cherts. The mean measurements were 34 mm (1.3 in) length; 17.6 mm (0.7 in) width; and 5.6 mm (0.2 in) thickness. The four examples in the study collection all fit within the type means (Table 3.109).

Table 3.109. Study Collection Backstrum Side Notched Projectile Point Summary Data

Type	Site	Object Length	Blade Length	Blade Width	Stem Width	Thickness	Material	Appendix D Figure #
Backstrum	36BV3	26.85	17.51	18.00	17.89	6.04	Chert, Kanawha	D29
Backstrum	36BV3	29.63	21.04	23.11	17.94	8.42	Chert, Kanawha	D29
Backstrum	36BV3	29.95	22.96	14.34	16.62	5.25	Chert, Onondaga	D29
Backstrum	36BV14	34.99	28.66	17.10	18.07	5.21	Chert, unidentified	D46

The triangular projectile point suite in the study area includes Fort Ancient, Hamilton Incurvate, and Madison types. Fort Ancient and Hamilton Incurvate points are formed as isosceles triangles. The Hamilton Incurvate blade edges are, not surprisingly, incurvate. "The basal edge varies from straight to convex resulting in acute, needlelike tips to the basal corners" (Church and McDaniel 1992:42). In contrast, the Fort Ancient type has slightly incurvate to convex edges. In the study collection sample (Table 3.110), both of the point types are smaller than their expected ranges. In the case of Fort Ancient points, Justice (1987:256) reports the length range as 31.75 – 50.8 mm, while the length range for Hamilton Incurvate is 24-35 mm (Justice 1987:256).

Table 3.110. Study Collection Fort Ancient and Hamilton Incurvate Projectile Point Summary Data

Type	Site	Object Length	Blade Length	Blade Width	Thickness	Material	Appendix D Figure #
Fort Ancient	36BV21	27.29	26.61	15.81	3.67	Chert, unidentified	D51
Hamilton Incurvate	36BV24	23.93		18.54	3.91	Chert, unidentified	D63
Hamilton Incurvate	36BV24	25.19	23.61	***22.45***	4.97	Chert, unidentified	D63
Hamilton Incurvate	36BV24	26.86	25.32	***19.72***	4.13	Chert, unidentified	D63
Hamilton Incurvate	36BV24	27.01		22.02	4.89	Chert, Onondaga	D63
Hamilton Incurvate	36BV24	30.26		20.17	4.98	Chert, Onondaga	D63
Hamilton Incurvate	36BV24	30.63		17.21	6.60	Chert, Onondaga	D63

The most prevalent of the triangles in the study collections were the Madisons. In total, 77 Madison examples were examined including whole and fragmentary examples and one preform (Table 3.111). The italicized and bolded measurements on Table 3.111 were taken on projectile points that had suffered some type of edge damage. These dimensional data should not be used in developing type ranges. In most cases, the Object Length measurement was the same as the Blade Length measurement and the Object Length metrics are not repeated in the Blade Length column. When a measurement is presented in the Blade Length column, it represents the measurement from the tip to the midpoint of the base on a straight line.

The Madison collection as a whole conforms to the size ranges presented in Justice (1987:256) which are: length 17-33 mm, width 12-21 mm, and thickness 3-6 mm. The material type was exclusively chert. The chert color categories (Table 3.112) in comparison to material types support the earlier discussion that certain colors are linked to specific chert types.

Table 3.111. Study Collection Madison Projectile Point Summary Data						
Site	**Object Length (OL)**	**Blade Length**	**Blade Width**	**Thickness (Blade)**	**Chert Type**	**Appendix D Figure #**
36AL6	37.5		18.9	6.9	Ohio Flint Ridge	D2
36AL62	19.9		16.4	3.5	unidentified	D16
36AL62	20.4		15.2	3.7	Onondaga – like	D14
36AL62	23.5		17.1	3.8	Onondaga	D12
36AL62	24.7		15.8	3.9	Onondaga	D17
36AL62	26.5		15.8	4.0	unidentified	D15
36AL62	26.8		17.9	5.0	Onondaga	D12
36AL62	27.6		16.6	3.3	unidentified	D12
36AL62	27.8		22.0	4.6	Onondaga	D12
36AL62	28.3		18.8	3.2	Onondaga	D12
36AL62	28.3		19.0	4.2	unidentified	D12
36AL62	28.5		17.2	6.7	unidentified	D16
36AL62	32.2		17.5	4.4	unidentified	D10
36AL62	32.4		18.6	6.2	unidentified	D23
36AL62	32.8		19.1	4.9	Onondaga	D12
36AL62	33.0			6.4	unidentified	D23
36AL62	33.6		14.6	4.6	Onondaga	D17
36AL62	35.4		17.4	4.7	unidentified	D10
36AL62	Tip broken		16.9	4.9	unidentified	D12
36AL62	Tip broken		23.4	5.3	Onondaga – like	D14
36AL62	Tip broken		17.1	3.5	Onondaga – like	D14
36AL62	Tip broken			4.0	Onondaga	D9
36BV4	20.04		17.02	4.81	local pebble	D33
36BV4	24.03		13.25	3.61	local pebble	D33
36BV4	25.06		11.46	5.98	local pebble	D33
36BV4	25.35		12.95	4.40	local pebble	D33
36BV4	26.05		14.28	3.97	local pebble	D33
36BV4	26.05		14.37	5.24	local pebble	D33
36BV4	30.66		14.68	3.66	local pebble	D33
36BV11	27.40		15.54	3.85	local pebble	D39
36BV11	27.66		16.83	4.94	local pebble	D39
36BV11	43.63		17.85	4.54	local pebble	D39
36BV21	22.27		23.16	4.06	Onondaga	D51
36BV21	23.25		***17.03***	3.46	unidentified	D51
36BV21	***25.53***	21.75	24.74	2.93	unidentified	D51
36BV21	25.80		***16.77***	4.33	unidentified	D51
36BV21	28.12		22.56	4.57	unidentified	D51
36BV21	31.13		27.20	4.60	unidentified	D51
36BV21			18.0	4.0	Onondaga	D52
36BV24	13.90		18.73	3.40	unidentified	D63
36BV24	15.92		11.70	2.71	Cochocton	D63
36BV24	16.95	15.06	19.52	3.32	Onondaga	D63
36BV24	20.14		16.84	4.73	Onondaga	D63
36BV24	21.51		17.50	4.28	unidentified	D63
36BV24	***21.86***		21.06	6.40	Onondaga	D63
36BV24	23.00		***20.24***	4.46	Cochocton	D63
36BV24	***25.15***		21.76	3.26	unidentified	D63
36BV24	25.59		16.85	3.90	unidentified	D63
36BV24	25.86		23.58	4.31	unidentified	D63
36BV24	26.02		27.02	7.00	Onondaga	D63
36BV24	30.10		18.05	4.74	Onondaga	D63
36BV24	30.86		14.13	3.71	Onondaga	D63

Table 3.111. Study Collection Madison Projectile Point Summary Data (continued)						
Site	**Object Length (OL)**	**Blade Length**	**Blade Width**	**Thickness (Blade)**	**Chert Type**	**Appendix D Figure #**
36BV24	31.84		18.05	4.27	unidentified	D63
36BV24	33.01	29.42	21.87	3.89	Onondaga	D63
36BV24	36.49	34.85	19.65	4.32	unidentified	D63
36BV24	37.64		20.35	3.90	Onondaga	D63
36BV24	38.87		***25.83***	5.20	Onondaga	D63
36BV24	39.21		26.46	4.20	unidentified	D63
36BV24	41.03		17.01	6.22	Onondaga	D63
36AL62	*		18.8	5.0	unidentified	D16
36AL62	*		16.5	4.1	unidentified	D16
36AL62	*		19.8	14.4	Onondaga	D19
36AL62	*		21.4	4.0	Onondaga	D19
36AL62	*		21.7	5.4	unidentified	D19
36AL62	*		20.5	5.5	Onondaga	D19
36AL62	*		15.5	4.0	Onondaga	D20
36AL62	*		17.4	6.9	local pebble	D23
36AL62	*		18.2	7.7	unidentified	D23
36AL62	*		21.5	4.7	Onondaga	D10
36AL62	*		17.0	4.0	Onondaga	D10
36AL62	*		17.0	4.3	Onondaga	D10
36AL62	*		21.9	4.6	unidentified	D10
36AL62	*		17.8	3.8	unidentified	D10
36AL62	*		17.5	4.8	unidentified	D10
36AL62	*		21.0	7.1	unidentified	D17
36AL62	*		18.4	4.0	unidentified	D17
36AL62	preform		24.3	8.4	unidentified	D23

Table 3.112. Study Collection Madison Projectile Point Color and Raw Material Comparison			
Color	**Material**	**N=**	**% of N=**
10YR6/2: Pale Yellowish Brown	Chert, unidentified	10	12.7
10YR7/4: Grayish Orange	Chert, unidentified	2	2.5
10YR8/2: Very Pale Orange	Chert, unidentified	2	2.5
5YR4/1: Brownish Gray	Chert, Onondaga	11	13.9
	Chert, Onondaga - like	1	1.3
	Chert, unidentified	3	3.8
5YR6/1: Light Brownish Gray	Chert, Onondaga	1	1.3
	Chert, Ohio Flint Ridge (OFR)	1	1.3
	Chert, Onondaga - like	1	1.3
	Chert, unidentified	1	1.3
N3: Dark Gray	Chert, Onondaga	1	1.3
	Chert, unidentified	1	1.3
N4: Medium Dark Gray	Chert, Onondaga	3	3.8
	Chert, local pebble	1	1.3
	Chert, unidentified	1	1.3
N5: Medium Gray	Chert, Onondaga	1	1.3
	Chert, Onondaga - like	1	1.3
	Chert, unidentified	1	1.3
Not recorded	Chert, Onondaga	11	13.9
	Chert, Cochocton	2	2.5
	Chert, local pebble	10	12.7
	Chert, unidentified	13	16.4
Total		**79**	**100.3**

Other Artifact Classes

The non-chipped stone artifact classes recovered from Late Woodland / Late Prehistoric sites in the study area include ground and pecked stone; ceramics, including both vessels and pipes; and bone, antler, and shell items. These artifact classes, per se, are not different from those recovered from earlier Woodland period sites. What is perhaps most striking about Late Woodland / Late Prehistoric assemblages in the study area, in general, is the persistence of the same artifact classes and types from period to period and phase to phase. This does not mean that there are no changes in class composition. Certainly, there are noticeable form alterations in projectile points and ceramics. But, other artifact classes and types of the Late Woodland / Late Prehistoric are not as temporally or culturally sensitive. These classes and types persist, virtually unchanged in configuration, throughout the Woodland era (if not longer).

Buker (1970; 1993) presents descriptions of the Late Woodland / Late Prehistoric ground and pecked stone recovered at the Drew Site (36AL62) and the Portman Site (36AL40). His discussions, and comments by others, provide overviews of these artifact classes. The Late Woodland / Late Prehistoric ground and polished stone collection from the Drew and Portman sites include discoidals, ellipsoidals, pitted stones, pigment, a full-grooved ax fragment, celts, hammerstones, mullers, pestles, an anvil stone, whole and fragmentary pentagonal and triangular pendants, an effigy stone, a whetstone, and an incised stone.

Except for the full-grooved ax fragment, all of the types listed have some representation at other Late Woodland / Late Prehistoric sites in the study area as well. The Drew Site (36AL62) full-grooved ax listed by Buker (1970) was recovered in a Late Woodland / Late Prehistoric pit but it probably represents residue from the earlier Archaic occupation of the site. Like the Drew Site (36AL62) ground and pecked stone assemblage, the Novak Site (36FA34) collection included ground stone discoidals, pitted stones, cannel coal pendants, and ground hematite (Boyce 1985). The ground stone assemblage from the Late Prehistoric Ryan Site (Westmoreland County) included a sandstone semi-platform pipe, a blunt poll celt, and a sandstone discoidal (George 1973). With the exception of discoidals and cannel coal pendants most of the artifact types are general purpose tools or items which span the Woodland era. Discoidals and cannel coal pendants seem to appear first during Late Woodland / Late Prehistoric (Mayer-Oakes 1955; Boyce 1985).

In addition to cannel coal pendants, there are other stone pipe and beads forms which also appear to be indicative of Late Woodland / Late Prehistoric. George and Fischer (1999:32) assign "...the bowl of a steatite pipe, and possibly, a serpentine artifact" to the late Monongahela occupations at the Hatfield Site. Based on a small comparative sample, George and Fischer (1999:39-43) hypothesize that the steatite pipe bowl is similar in form to long stemmed steatite pipes dating to the Protohistoric period, while the serpentine bowl may be part of an object manufactured in the Late Prehistoric period in the Tennessee River Valley vicinity. Burkett (1999:95) comments on “geometric ground stone beads” recovered at the Fishbasket Site (36AR134) which appear to be almost identical to ones recovered from

the Fort Loudon Site (36FR31) and Locust Grove (36LA40) south and east of Fishbasket along the Frankstown-Venango aboriginal path.

The appearance of shell tempered pottery in the eastern Midwest, upper Mid-Atlantic, and New York/Pennsylvania regions heralds the onset of the Late Woodland / Late Prehistoric continuum. In the study area, however, the initial Late Woodland ceramic types are Watson Cordmarked and Plain. These are Middle Woodland, limestone tempered holdovers and both limestone and grit tempered ceramics continue to be manufactured through the Late Woodland / Late Prehistoric period in Mead Island, Allegheny Iroquois, Clemsons Island and Owasco, and Whittlesey areas (Brose 2000; Burkett 1999, 1981a).

In the core area, the subsequent shell tempered wares, which continue in use to Contact times, include Monongahela Cordmarked, Plain, and Incised, and McFate Incised (also referred to as Monyock Incised; Mayer-Oakes 1954, 1955). McFate Incised also appears in varietals that are limestone, limestone/shell, and grit tempered (Myers 2000). Although occasional shell inclusions are present in Scarem Plain, this type is effectively not tempered in the traditional sense though it may contain hematite inclusions.

Monongahela Cordmarked, Plain, and Incised, Monyock Cord Impressed, and Scarem Plain were described by Dragoo (1955, 1971) in the Johnston Site (36IN2) report and Monongahela Plain and Scarem Plain were detailed by Mayer-Oakes (1954) in the Scarem Site (36WM22) report. Monongahela Cordmarked is cordmarked on the exterior and 30 to 50 percent of the cordmarks are typically obliterated (Mayer-Oakes 1954:48). Other surface manipulations include notched and cord impressed rims, defined castellations along the rim, and occasional perforations near the vessel necks. Rims are slightly flaring to straight and the most common vessel form is an elongated, globular jar.

Monongahela Plain duplicates the characteristics of Monongahela Cordmarked except its surface is either plain or covered with smoothed-over cordmarking. Very rarely, Monongahela Plain sherds display exterior surface incising. The pattern usually consists of parallel lines set in a rectilinear pattern (Dragoo 1971:563-569). Monongahela Incised is a minority variety and it is basically incised Monongahela Plain. Mayer-Oakes (1955:199-200) noted that at least one piece displayed a curvilinear guilloche treatment and that piece actually might be a fragment of Fort Ancient tradeware. Monongahela Incised differs from McFate/Monyock Incised in few ways; Monongahela Incised surfaces are plain while McFate/Monyock Incised exterior body surfaces are cordmarked. McFate Incised, as noted above, also is tempered with items other than shell (Myers 2000).

Scarem Plain is a rare modeled type formed from a single clay lump (Dragoo 1971:573). Scarem Plain vessels have plain or occasionally smoothed cordmarked surfaces. Despite the name, the lips and necks of Scarem Plain vessels may display incisions or punctuations. The vessels are small, rarely exceeding 3 to 6 cm (1.2 to 2.4 in) in height or 2 to 4 cm (0.8 to 1.6 in) in diameter. The vessels are interpreted as toys and they also have been recovered from juvenile burials (Mayer-Oakes 1954:50).

Almost the entire Howarth-Nelson Site (36FA40) ceramic assemblage was comprised of Monongahela Cordmarked and Monongahela Plain. About 80 percent of the Monongahela Cordmarked sherds are assigned to the early Middle Monongahela period, Campbell Farm phase. The diagnostic characteristics include mild to prominent excurvate rims, irregularly flattened to flat and squared lip profiles, smooth surface lips, and infrequent use of oblique gashes and oblique cordmarked edge stamping on lips (Adovasio et al. 1990:50). The later, Protohistoric phase occupation of the site left ceramic residue that was markedly different from the Campbell Farm phase collection. Two vessel types are noted by Adovasio et al. (1990:51). The first are ones with "scalloped or 'pie crust' lip surfaces which are characterized by deep, oblique notches that have been executed with a smooth-surfaced tool" (Adovasio et al. 1990:51). The second vessel type has collared rims.

While ceramic pipes are not uncommon in the Late Woodland / Late Prehistoric periods; examples with decorated bowls are not common. Three shell tempered ceramic pipe fragments were recovered from the Saddle Site (46MR95); two of the three were decorated. One bowl had vertical parallel line incisions. The second displayed vertical parallel incised lines on both the bowl and the stem (Church and McDaniel 1992:36). Mayer-Oakes (1954) recovered two incised pipe stems during the Sacrem Site (36WH22) excavations and one pipe bowl was collared. The Sacrem Site (36WH22) investigations also yielded a partial Monoyock Cord Impressed bird effigy pipe.

Because the Late Woodland / Late Prehistoric sites are relatively recent, preservation allows us to see the broad spectrum of material types present at sites dating to these periods. The antler, bone, and shell assemblages recovered from a sample of Late Woodland / Late Prehistoric sites in the study region testify to the variety of tool and decorative elements manufactured from these material types.

The Novak Site (36FA34) yielded pendants and beads manufactured of elk canine, marginella shell, conch shell columnella, bird and mammal bone and a human molar, in addition to bone awls and worked turtle shell carapaces (Boyce 1985). Mayer-Oakes (1954:47) recovered items he classified as “cups or spoons of box-turtle [sic] shell” at the Scarem Site (36WH22) and turtle shell cups were recovered from the Portman Site (36AL40; Buker 1993:34).

The antler assemblage from the Drew Site (36AL62) included points, flakers, a spatula, drifts, scored pieces, and an effigy (Buker 1970). The bone collection is exceptionally varied and includes splinter and joint end awls, pins, beamers, gouges, beads, fishhooks, disks, modified deer phalanges, turtle carapace cups and cut pieces, a possible worked wolf palate, a worked wolf incisor, and beaver incisor chisels, in addition to scored and worked bone fragments. The worked shell includes mussel shell 'hoes' (displaying a ground edge) and mussel columnella beads.

Finally, the Howell Site (36AL100) collection included polished bone awls and bone beads, a bone 'teardrop' pendant, marginella shell beads, a polished deer bone, and engraved turtle shell. The bone awl collection from Howell contained the same forms as identified at the Drew Site.

Research Issues – Late Woodland / Late Prehistoric

Late Woodland / Late Prehistoric research issues based on the current study are focused in four areas: chronology, settlement systems, subsistence processes, and ceramic technology. The research areas of concern are all focused by an overriding issue. This issue is the relationship of Monongahela to the other contemporaneous cultural groups in the same region. The study area hosts several cultures during the Late Woodland / Late Prehistoric which share common traits but which are differentiated from one another by feature types, site layouts, horticultural dependence, and differences in ceramic technology. There are no strong data to suggest that any of these groups, including the Monongahela, moved into the study area or that they were ever at odds with one another. The questions developed below are directed at the further definition of the various Late Woodland / Late Prehistoric study area culture groups.

The first issue focuses on chronology. The large suite of Late Woodland / Late Prehistoric radiocarbon dates (Appendix I; also Brose 2000; Nass and Hart 2000) still has not led to the resolution of the beginning of the period. Middle Woodland hallmark types such as Watson series ceramics clearly continue to be manufactured well into the Late Woodland / Late Prehistoric era. Further, the beginning and end dates for phases are murky and seem to vary by drainage valley. The primary chronology research issue stated below.

- Is the Late Woodland / Late Prehistoric beginning date little more than a general marker which likely would vary from valley to valley within the study area? If yes, then what does this imply about the rates of culture change and the influences which lead to culture changes in the study area?

It was impossible to resolve issues related to site settlement strategies among the various Late Woodland / Late Prehistoric culture groups with the PASS (Subbasin 20) data. There were two reasons for this: (1) a lack of precise UTM data; and (2) variable reporting of artifact hallmarks in the database. Research in the last decade in the study area, in particular, has demonstrated that cultural constructs like Mead Island, various Monongahela phases, Whittlesey, Cole-Baldwin, and others can be discriminated from one another on the bases of architectural and artifact types. The research avenues pertinent to these issues and settlement strategies in general include the following.

- Using PASS (Subbasin 20) UTM data, can the geographic extent of the Late Woodland / Late Prehistoric cultures be more precisely drawn? Can the geographic 'boundaries' be delimited by time period?

- Using both the PASS (Subbasin 20) UTM and site-size data, is it possible to discriminate possible special function sites from hamlets and villages by culture area? What do the resultant data suggest about differences in site settlement strategies through the Late Woodland / Late Prehistoric period?

Subsistence data for the Late Woodland in the study area suggests that specific species selection is being made by some, if not all, of the cultural groups. Among the faunal

species, particular attention seems to be placed on deer, elk, turtle, and fish. For the floral species, the variety of species exploited may have decreased over those used in preceding periods. The research issues pertinent to these trends are stated below.

- Resource-specific sites (Raber 1989, 2004) suggest that Late Woodland / Late Prehistoric subsistence was focal and emphasized a suite of species to the exclusion of other, equally available ones. Is this conclusion correct? If correct, is focal exploitation common to all of the Late Woodland / Late Prehistoric groups in the study area?

- There seems to be a trend toward decreasing numbers of exploited floral species? Is this correct? If correct, what does this imply about the reliance of various Late Woodland / Late Prehistoric groups upon horticultural products, in particular corn?

The focus of much attention as regards Late Woodland / Late Prehistoric artifact assemblages has been on differences in ceramic temper, surface modification, rim and neck decoration, and cord twist. This research has done much to discriminate various cultural groups during the period. Other artifact classes have not been studied to the same extent. For this reason, the paramount research issue is stated below.

- Are there artifact types in the study area other than ceramics which are uniquely indicative of the various Late Woodland / Late Prehistoric groups?

CONCLUSIONS

Throughout the preceding discussions, an attempt has been made to discuss each of the five research themes outlined by the District in their research design (U.S. Army Corps of Engineers n.d.). There are several gaps, however, in the comparative data set for both Subbasin 20 and the larger study region and these were discussed by time period. The short concluding section of this portion of the chapter deals with other research avenues that also may be important to our understanding of the various occupations at Site 36AL480.

Cultural Chronology

The Subbasin 20 study area relative chronology has three critical data gaps:

- limited set of Paleoindian, Early Archaic, and Middle Archaic absolute dates;

- ambiguous diagnostic hallmarks and overlapping absolute dates for Late Archaic, Terminal Archaic, and Early Woodland; and

- incomplete definition of early Late Woodland non-Monongahela traits.

The extremely small number of absolute dates obtained for Paleoindian, Early Archaic, and Middle Archaic occupations in Subbasin 20 is not atypical. Sites from these three periods are often re-occupied by later occupants and evidence of earlier occupations are obliterated or masked. Further, the number of single component sites dating to each of these periods is very small and based almost solely on surface or Phase I assumptions.

The Late Archaic to Early Woodland continuum continues to be ambiguous in the study region. The reasons for this appear to be two-fold: (1) diagnostic hallmarks are not restricted to a single period; and (2) absolute dates overlap. The same problem exists for the Middle Woodland to Late Woodland transition. If, indeed, the Middle Woodland is actually present in some fully realized form in the study area, its hallmark traits are ill-defined and its temporal parameters overlap the end date of the Early Woodland and the beginning date of the Late Woodland.

Site Settlement Patterns

At this juncture, the comparative database is generally lacking data sets or studies focused on general Archaic, Early Woodland, and Middle Woodland occupation surfaces (size and configuration), feature types, co-occurring feature types, and activity area definition by temporal period. Studies such as Moeller's (1991) analysis of Late Woodland features are absent for the study area though individual, site specific analyses like that completed at the Howarth-Nelson Site (36FA40) are available (though most are the result of investigations at Late Woodland Monongahela sites). The research questions at this juncture are very straightforward.

- Can discrete feature sets be defined by time period in the region?
- If discrete feature sets can be defined, what causal effects account for the introduction and dismissal of a feature type from a specific time period?
- If feature sets cannot be defined, what factors might account for a static set of adaptive responses over such a longer period of time?

Artifact Assemblages and Lithic Technologies

The Phase I and II collection recovered during the Davis (2001) excavations at Site 36AL480 provide insight into the prehistoric use of the site vicinity. The fact that much of the material cannot be correlated easily to specific occupation periods is to the detriment of the research at the site. Despite the limitations to this data set, however, it should be reanalyzed following the same analytical strategies being used by other site investigators. The reexamination should be completed so that a clearer understanding of the uses of the landform outside of the Phase II and III areas of investigation can be obtained.

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