

Sussex County Community College Anthropology Program

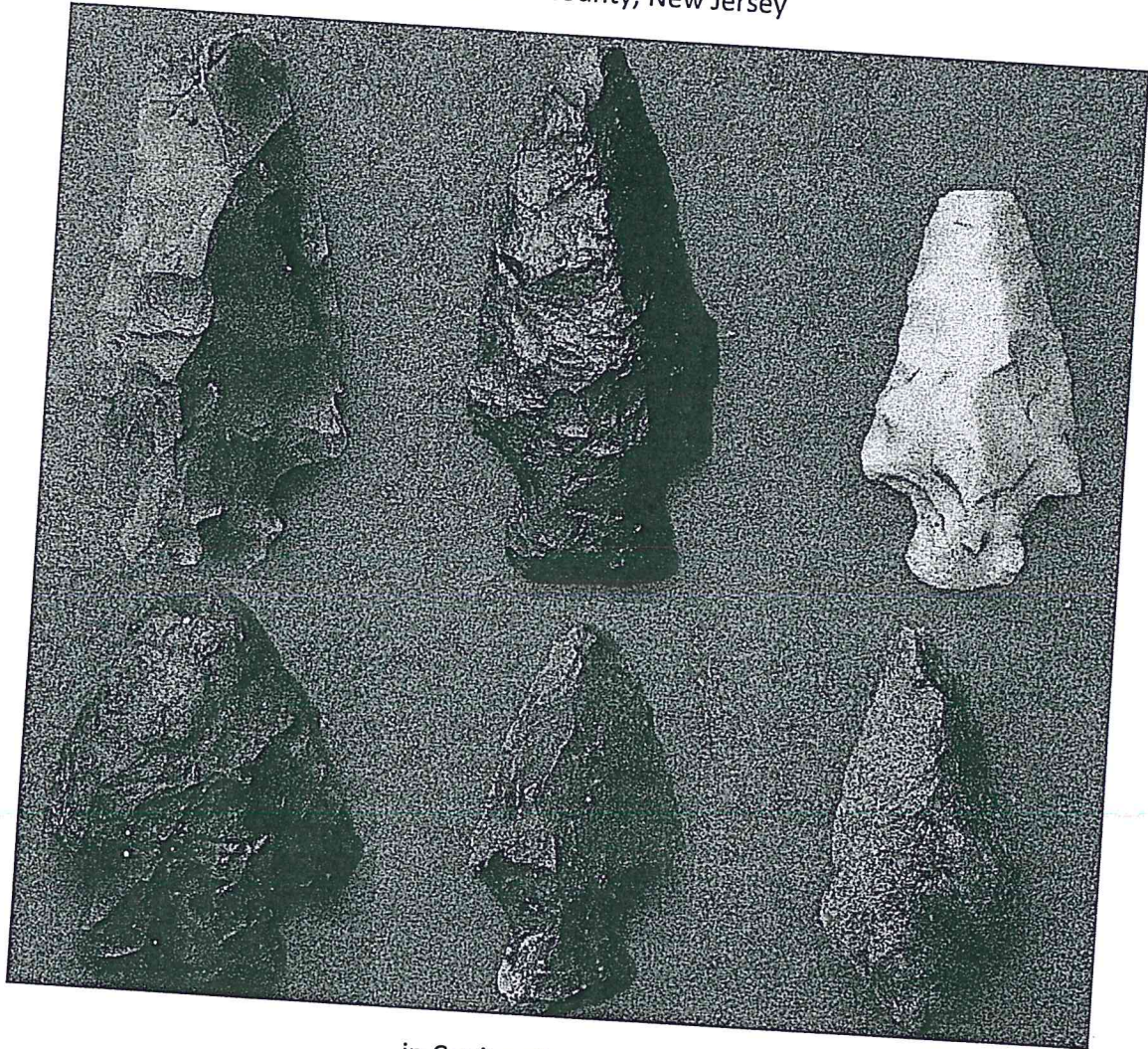
Occasional Paper No. 1

An Analysis of Surface Collected

Lithic Artifacts

from the Walnut Grove Farm Site (28Sx483), Hampton and Frankford Townships,

Sussex County, New Jersey



in conjunction with the

2013 Sussex County Community College Archaeological Field School

By

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Edited by

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Introduction

The personal collection which provided the artifacts for this report were recovered over many years by Les and Deb Guile on their property, the Walnut Grove Farm in Sussex County, Augusta, New Jersey. This property was selectively excavated during the 2013 Sussex County Community College Archaeological Field School under the direction of William Sandy, RPA, and Adjunct Professor of Anthropology at the college. These artifacts were analyzed, and this report written by James P. Kotcho, MA, Adjunct Professor of Anthropology at the college. It was edited by Sandy. This report is the first in a series of reports planned for this site.

The artifacts examined consisted of both chipped stone (27 artifacts) and cobble stone (8 artifacts). The examined artifacts are a subset of the total collection which were chosen by the author as being most capable of being assigned to a cultural period and to suggest the types of activities carried out on the site. All dimensions and weights are metric. Weights are given to the nearest gram (g) and measurements to the nearest millimeter (mm). Les Guile grouped the chipped stone artifacts by type and assigned a number to each display tray. The tray number for each chipped stone artifact is indicated in the data portion. Cobble tools are not assigned to a tray. Circumference of cobble tools was measured along edges of the longest axis of the piece. Each artifact is accompanied by a photograph with an appropriate sized scale. A brief description of observable features is given, as well as the raw material type, where identification was made. In the case of projectile points, a type is indicated along with a cultural period when it was possible to make an accurate determination. Otherwise, a point is assigned to a generic type (stemmed, notched or lanceolate). All tools were examined for signs of usewear under 10X magnification. Edge angles for both projectile points and scrapers were not measured. Figure 1 illustrates a standard projectile point terminology used in the analysis. A Glossary of Terms follows the Conclusions. I wish to extend my thanks to Jack Cresson, an experienced archaeologist, lithic analyst, and flintknapper for his input and insight into many of the artifacts. He gave generously of his time to examine artifacts and review the data*. All measurements and analysis were accomplished by the author of this report and he bears final responsibility for all identification, data, inferences and conclusions.

Standard Projectile Point Terminology

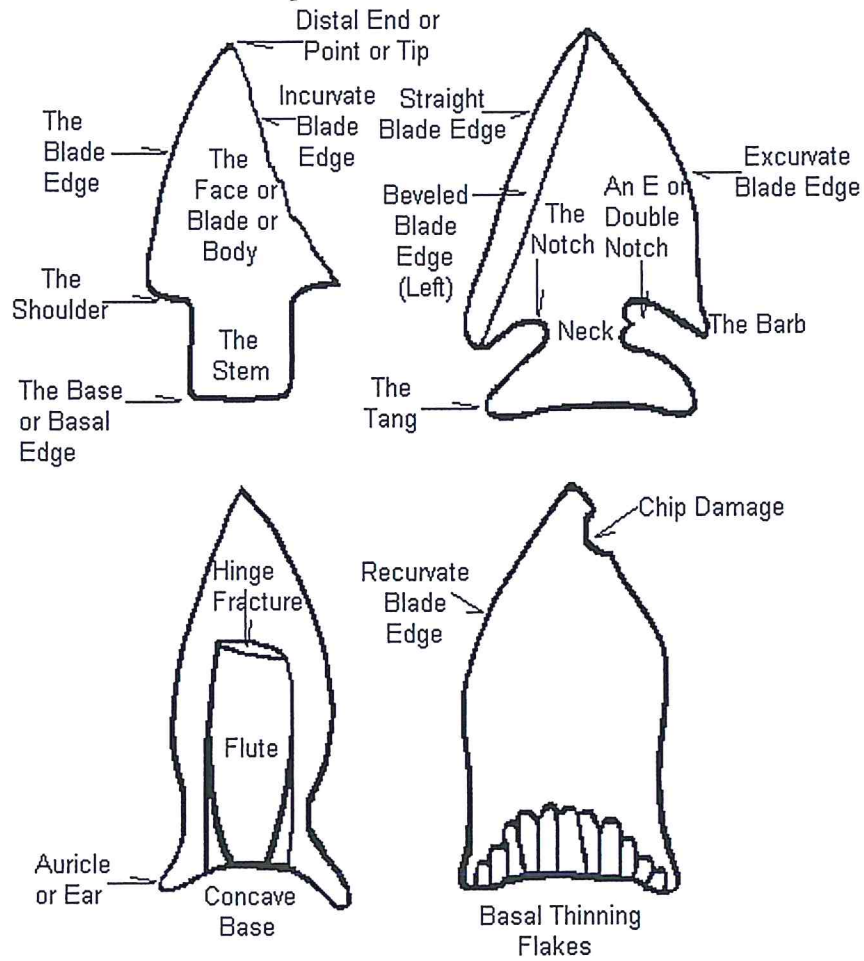


Figure 1: A standard projectile point terminology utilized in this analysis (Gumbas, 2008).

The table below presents the cultural/temporal periods in general use in Eastern prehistory and the Middle Atlantic region of the United States. Generally speaking, these periods represent cultural adaptations to the changing climatic and environmental conditions since the migration of humans into the New World. In summary form, the Paleo-Indian period represents big game hunting in an Arctic-Boreal climate. The Archaic period is one of hunting smaller animals and gathering of food as the climate changes from Boreal to an essentially modern climate. The Woodland period is one of hunting and gathering, the development of horticultural, the development of ceramics and the introduction of the bow and arrow. This is a simplistic outline of 12,000 or more years of human development; for more information the reader is directed to books by the late Herbert Kraft (2001) and Alan Mounier (2003 New Jersey Geological Survey).

New Jersey Prehistoric Cultural Periods		
Paleo-Indian	11,500 B.P.	10,000 B.P.
Archaic	10,000 B.P.	3,000 B.P.
Early Archaic	10,000 B.P.	8500/8000 B.P.
Middle Archaic	8500/8000 B.P.	5000 B.P.
Late Archaic	5000 B.P.	3000 B.P.
Woodland	3000 B.P.	350 B.P.
Early Woodland	3000 B.P.	2500/2000 B.P.
Middle Woodland	2500/2000 B.P.	1050/1100 B.P.
Late Woodland	1050/1100 B.P.	ca.350 B.P.

Table 1: New Jersey Prehistoric Cultural Periods (adapted from Kraft 2001). In the conventions of archaeology, “ Before Present (B.P.)” is used more frequently since the advent of radiocarbon dating. The present for archaeologists is 1950. All the dates in the table are subject to revision based on more recent archaeological research.

*Jack Cresson has practiced archaeology for over 40 years in New Jersey and the Middle Atlantic region. He is an accomplished lithic technologist and flint knapper who has consulted and provided demonstrations and workshops to Native American organizations, schools, colleges and universities, as well as, nature and environmental centers, museums and living history organizations. He is a founding board member of the international Society of Primitive Technology and society of Reconstructive and Experimental Technology. He was inducted as a Fellow of the Archaeological Society of New Jersey in 2000 and in 2013 received their Lifetime Achievement Award.

Environmental Setting

The Walnut Grove Farm site (28Sx483) is located in the Kittatinny Valley in the Valley and Ridge Physiographic Province (see Figure 1) in northwestern New Jersey (New Jersey Geological and Water Survey 2002). The site may be found on the USGS 7.5 minute Newton East Quadrangle, New Jersey, Sussex County. It is within the Paulins Kill River drainage and is approximately 600 m east of the river. The site lies on gently sloping terrain on a working organic farm.

The Valley and Ridge Physiographic Province is located in northwestern New Jersey. It contains 530 square miles and is situated between the Delaware River and the New Jersey Highlands. Geologic processes created an area of long linear valleys and ridges which gives the province its name. The province consists of three distinctive physiographic regions, the Delaware Valley, the Kittatinny Mountain and the Kittatinny Valley.

The Kittatinny Valley, which includes the Paulins Kill River Valley, is generally underlain by soluble dolomite and limestone formations. The Paulins Kill, a tributary of the Delaware River, flows in a general southwestern direction, and it’s bed is scoured through the dolomite and limestone formations. Relief can be as much as 200 feet with many rocky outcrops. This produces a rugged terrain with small rocky knolls and ridges, sinkholes and streamless valleys. Springs are fairly common throughout the Kittatinny Valley. Large irregular glacial depressions or karst basins cover portions of the valley. The largest of these basins are Swartswood, Newton Meadows and Great Meadows, Glacial processes of scouring and dissolution of the dolomite

and limestone bedrock produced these karst basins. During the last glacial episode, deposits of silt, clay, sand and gravel from glacial lakes were deposited in the basins as well as other portions of the valley. Slate, siltstone and sandstone belts, running in a generally northeastern direction, underlie the higher portions of the Kittatinny Valley. The preceding discussion of the geology was adapted from Wolfe's *The Geology and Landscapes of New Jersey* (1977).

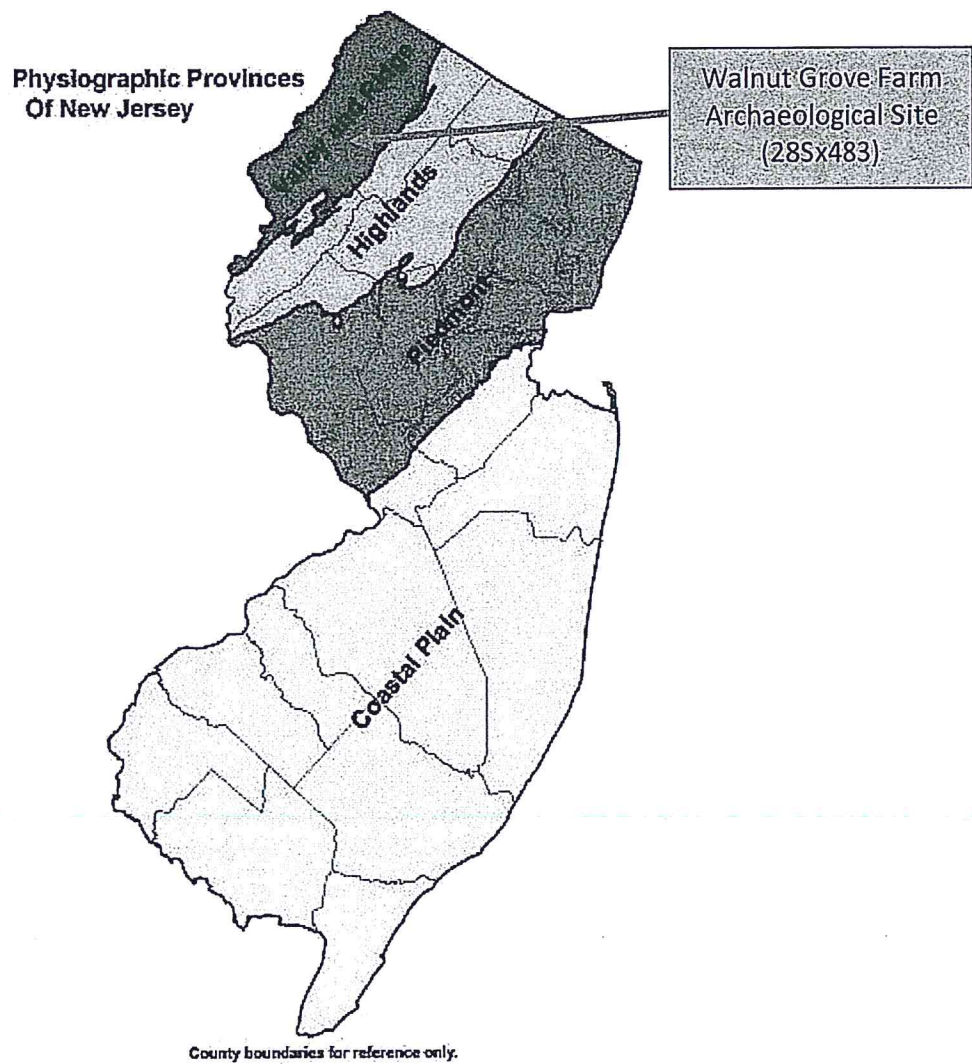


Figure 2: Physiographic provinces of New Jersey of (New Jersey Geological and Water Survey 2002). Approximate location of the Walnut Grove Farm is shown.

Chipped Stone Artifacts

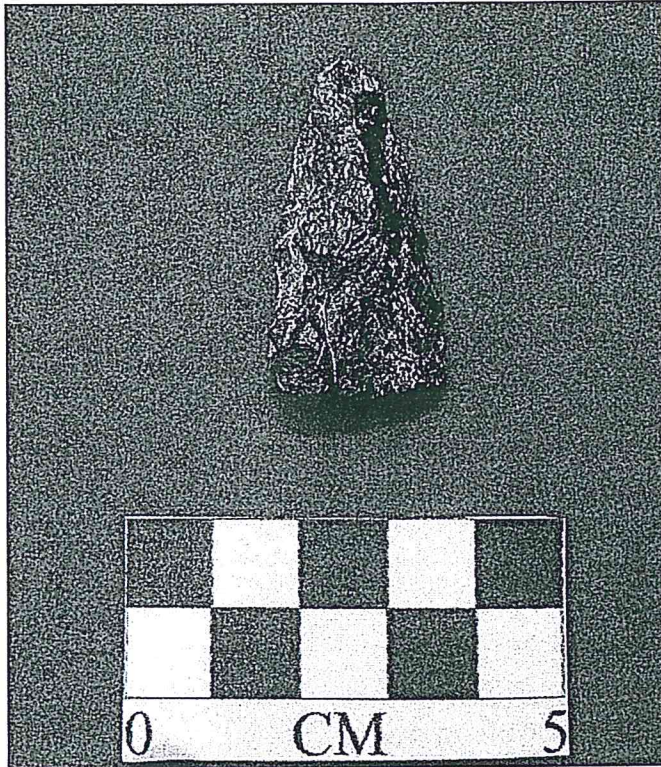


Plate 1

Artifact Type: Biface Preform, Trianguloid
Cultural/Temporal Period: Unknown

Maximum Length: 40.2 mm
Width: 21.4 mm
Thickness: 9.6 mm
Width/Thickness Ratio: 2.2
Weight: 7.6 g
Raw Material: Black Chert
Condition: Tip Broken
Location: Tray 1

Notes: The specimen has a general trianguloid shape with slightly excurvate edges. It is rather thick with a width/thickness ratio of 2.2. Finished bifaces width/thickness ratios commonly fall between 4.1-6.0 (Callahan 1979:10). There is little evidence of pressure flaking to sharpen or reduce edge angle. Tip may have been broken in manufacture. There is no observable edge damage under magnification. It was most likely discarded due to the inability of the knapper to thin the objective piece sufficiently for use as a projectile point.



Plate 2

Artifact Type: Biface, Late Stage, Basal Notched
Cultural/Temporal Period: Middle Woodland

Maximum Length: 35.2 mm

Width: 32.4 mm

Thickness: 6.4 mm

Width/Thickness Ratio: 5.1

Weight: 7.6 g

Raw Material: Black Chert

Condition: Tip Broken

Location: Tray 1

Notes: The biface is trianguloid in shape with incipient basal notches. Edges are slightly excurvate. Chert is glossy indicating it may have been heat treated. It is fairly thin with a width/thickness ratio of 5.1. Finished bifaces width/thickness ratios commonly fall between 4.1-6.0 (Callahan 1979:10). However, there is little evidence of pressure flaking to sharpen or reduce the edge angle (not measured). Tip may have been broken in manufacture. There is no evidence of edge damage under magnification. Kinsey (1972) originally dated basal notched projectile points (Eshback) to the Late Archaic period but they are generally considered indicative of the Middle Woodland period (Custer 2001:26; Wall, *et al.* 1996:92).

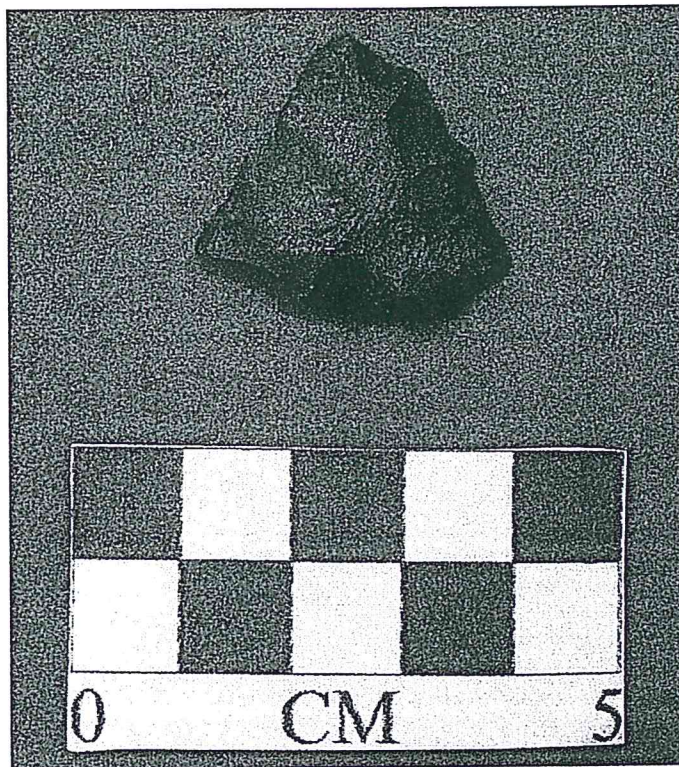


Plate 3

Artifact Type: Biface, Late Stage, Basal Notched
Cultural/Temporal Period: Middle Woodland

Maximum Length: 26.4 mm
Width: 28.6 mm
Thickness: 5.15 mm
Width/Thickness Ratio: 5.6
Weight: 3.2 g
Raw Material: Black Chert
Condition: Tip Broken
Location: Tray 1

Notes: The biface is trianguloid in shape and is greater in width than length with weak basal notches. Edges are slightly excurvate. It is rather thin with a width/thickness ratio of 5.6. Finished bifaces width/thickness ratios commonly fall between 4.1-6.0 (Callahan 1979:10). However, there is little evidence of pressure flaking to sharpen or reduce edge angle (not measured). It has a small impact fracture at the tip. There is no evidence of edge damage under magnification. Kinsey (1972) originally dated basal notched projectile points (Eshback) to the Late Archaic period but they are generally considered indicative of the Middle Woodland period (Custer 2001:26; Wall, *et al.* 1996:26).

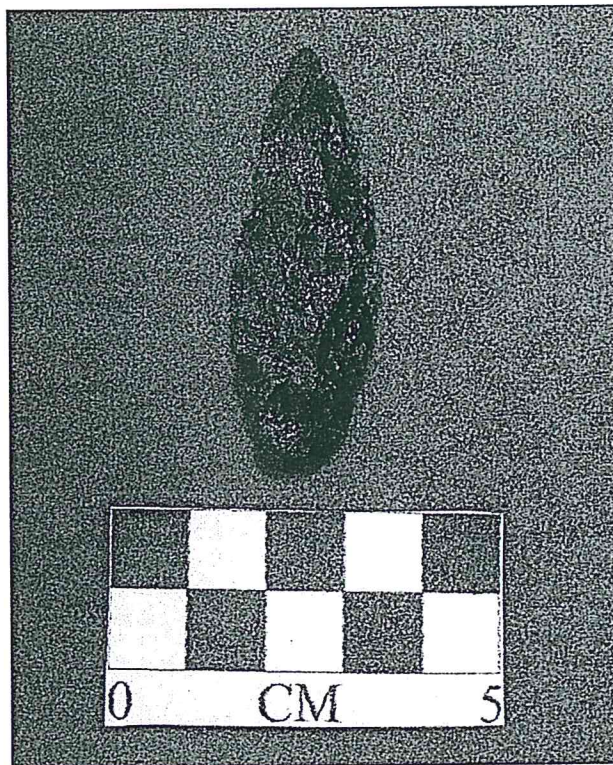


Plate 4

Artifact Type: Biface, Late Stage, Poplar Island Variant
Cultural/Temporal Period: Middle Archaic- Middle Woodland

Maximum Length: 52.7 mm
Width: 20.9 mm
Thickness: 10.8 mm
Width/Thickness Ratio: 1.9
Weight: 10.8 g
Raw Material: Black Chert
Condition: Whole
Location: Tray 2

Notes: The biface is lanceolate in shape with a contracting base. Edges are slightly excurvate and biconvex in cross section. It is rather thick with a width/thickness ratio of 1.9. The shoulders, which grade into stem, are rounded and weak. There is little evidence of pressure flaking to sharpen or reduce edge angles. There is no evidence of edge damage under magnification. The material is a "rotten chert" with visible hollow inclusions. This point is similar to Type 25A in Wall *et al* (1996:82) which dates from the Late Archaic though the Middle Woodland period. Custer (2001:43) suggests these Poplar Island points date to the Middle Archaic (5,000 B.C.) through the Middle Woodland periods.

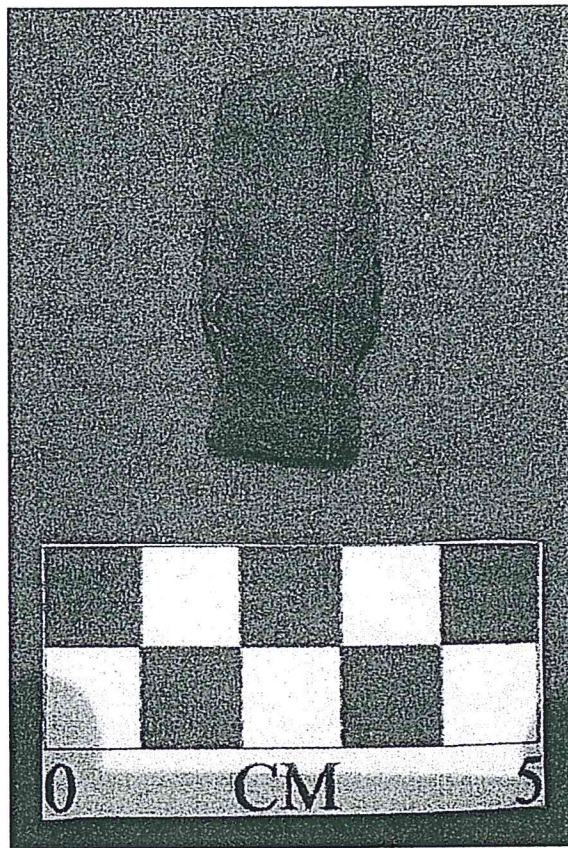


Plate 5

Artifact Type: Projectile Point, Fishtail Variant
Cultural/Temporal Period: Late Archaic-Early Woodland

Maximum Length: 39.7 mm

Width: 18.2 mm

Thickness: 7.5 mm

Width/Thickness Ratio: 2.4

Weight: 6.0 g

Raw Material: Black/Grey Rhyolite

Condition: Broken

Location: Tray 2

Notes: The biface is narrow bladed with an expanding stem. Edges are slightly excurvate and biconvex in cross section. It is relatively thick with a width/thickness ratio of 2.4. The base width is similar to that of the blade. Shoulders are oblique to the base. There is little evidence of pressure flaking to sharpen or reduce edge angle. There is no evidence of edge damage under magnification. The tip of the point has a transverse to slightly oblique break. This point is similar to Type 10B in Wall *et al* (1996:67) which dates to the Late Archaic period. Custer (2001:30) suggests these Fishtail points date from the Late Archaic through the Early Woodland periods.



Plate 6

Biface I

Artifact Type: Projectile Point, Fishtail Variant

Cultural/Temporal Period: Late Archaic-Early Woodland

Maximum Length: 46.2 mm

Width: 21.0 mm

Thickness: 8.1mm

Width/Thickness Ratio: 2.6

Weight: 7.2 g

Raw Material: Dark Grey Chert

Condition: Broken

Location: Tray 3

Notes: This biface is triangular in shape with fairly deep notches and an expanding stem. Its edges are slightly excurvate and the base is rather straight. The piece is biconvex in cross section. It is relatively thick with a width/thickness ratio of 2.6. There is little evidence of pressure flaking to sharpen or reduce the edge angles. There is no evidence of edge damage under magnification. The tip of the point has a slightly oblique transverse break most likely as a result of impact. One ear of the base is broken. Most of the tools on this site are made from a black Paulins Kill chert. This material is most likely imported from another source. This point is similar to Type 10A in Wall *et al* (1996:66-67) which dates to the Late Archaic period. Custer (2001:30) suggests these Fishtail points date from the Late Archaic through the Early Woodland periods.

Biface II

Artifact Type: Projectile Point, Fishtail Variant

Cultural/Temporal Period: Late Archaic-Early Woodland

Maximum Length: 50.8 mm

Width: 20.6 mm

Thickness: 8.6 mm

Width/Thickness Ratio: 2.4

Weight: 9.1 g

Raw Material: Black Chert

Condition: Broken

Location: Tray 3

Notes: The biface is triangular in shape with fairly long moderately deep notches and an expanding stem. Edges are slightly excurvate and the base is rather straight. The piece is biconvex in cross section. It is relatively thick with a width/thickness ratio of 2.4. There is little evidence of pressure flaking to sharpen or reduce edge angles. There is no evidence of edge damage under magnification. The tip of the point has a slightly oblique transverse break most likely as a result of impact. One ear of the base is broken. This point is similar to Type 10A in Wall *et al* (1996:66-67) which is dated to the Late Archaic period. Custer (2001:30) suggests these Fishtail points date from the Late Archaic through the Early Woodland periods.

Biface III

Artifact Type: Projectile Point, Lackawaxen Expanding Stem/Normanskill/Pequea

Cultural/Temporal Period: Middle Archaic-Middle Woodland

Maximum Length: 38.5 mm

Width: 18.0 mm

Thickness: 6.6 mm

Width/Thickness Ratio: 2.7

Weight: 3.8 g

Raw Material: Light Grey Chert

Condition: Broken

Location: Tray 3

Notes: The biface is an elongated triangle with moderately deep notches and an expanding stem. The base is concave and thinned. The edges are fairly straight. The piece is biconvex in cross section. The shoulders are well defined. It is relatively thick with a width/thickness ratio of 2.7. There is little evidence of pressure flaking to sharpen or reduce edge angles. There is no evidence of edge damage under magnification. The tip of the point is broken transversely most likely as a result of impact. This point is similar to Type 18 (Lackawaxen Expanding Stem) in Wall *et al* (1996:75) which dates to the Late Archaic period (c. 1710 B.C.). Custer(2001:40) lumps these points together as Pequea with Normanskill and Lackawaxen as minor types and suggests these points date from the Middle Archaic through the Early Woodland periods.

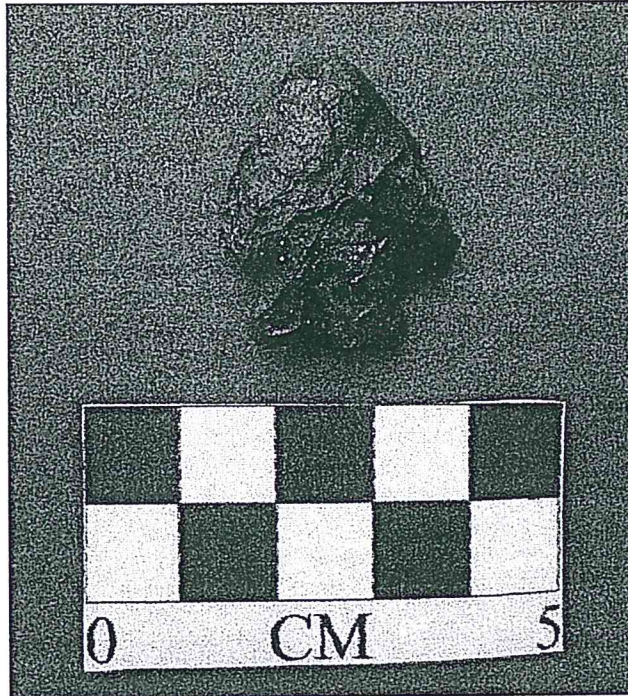


Plate 7

Artifact Type: Projectile Point, Brewerton

Cultural/Temporal Period: Late Archaic-Middle Woodland

Maximum Length: 30.6 mm

Width: 24.4 mm

Thickness: 5.8 mm

Width/Thickness Ratio: 4.21

Weight: 4.6 g

Raw Material: Black Chert

Condition: Broken

Location: Tray 3

Notes: Triangular blade with notches which form rather weak ears. Edges are slightly excurvate. Damage to tip and one shoulder most likely from impact. The base is straight but is interrupted by a small flake scar. The width/thickness ratio is 4.21. This point mostly closely resembles Type 32 of Wall *et al* (1996:90) Brewerton Corner Notched (see specimens Plate 21). These points are thought to be representative of the early Late Archaic. Ritchie (1989:19) categorizes these as Brewerton Side Notched points derived from Late Archaic sites (Plate 7). Custer (2001:66-67) suggests that similar notched points (but given different names) were found in Early/Middle Woodland contexts. Justice (1995:119-124) considers these points part of the Matanzas Cluster of side notched specimens characteristic of the Late Archaic period in the Midwest.

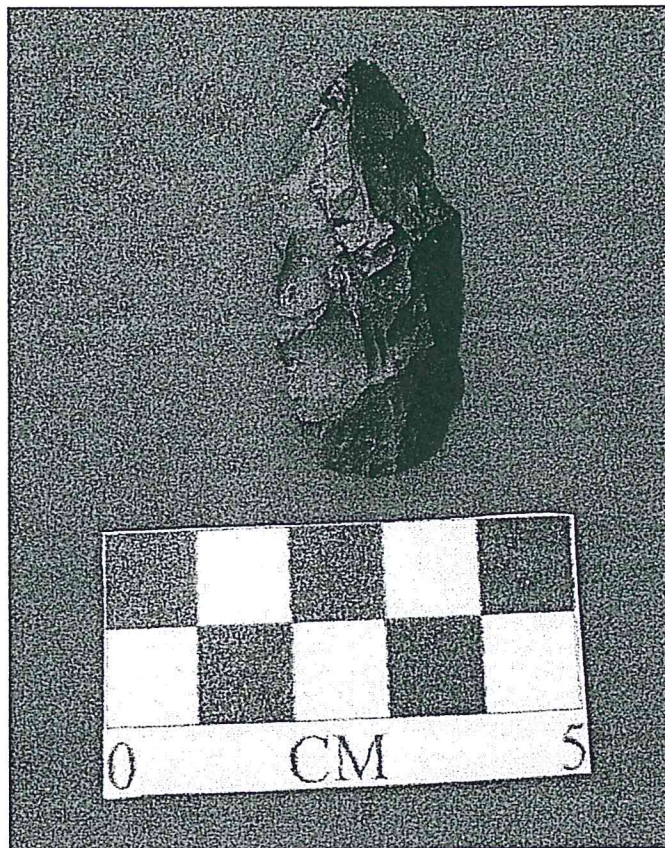


Plate 8

Artifact Type: Biface Preform
Cultural/Temporal Period: Unknown

Maximum Length: 46.4 mm
Width: 21.8 mm
Thickness: 7.8 mm
Width/Thickness Ratio: 2.8
Weight: 8.2 g
Raw Material: Black Chert
Condition: Whole
Location: Tray 3

Notes: Ovate shaped biface which seems to have been abandoned due to the inability to remove medial hump of material. Base appears to be thinned. Edges are excurvate. Artifact is biconvex in cross section. Flake removal is the result of hard hammer percussion. No signs of usewear on edges under magnification.

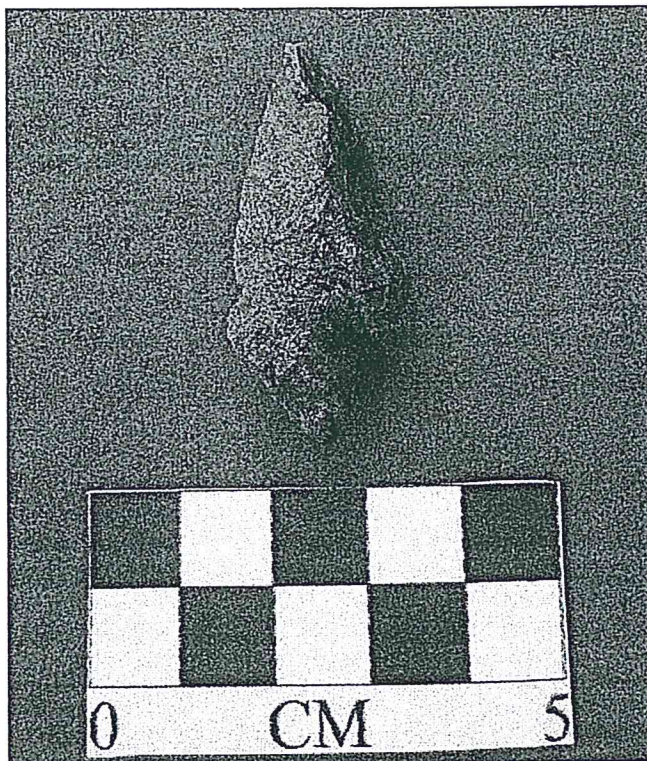


Plate 9

Artifact Type: Projectile Point, Rossville
Cultural/Temporal Period: Early-Middle Woodland

Maximum Length: 43.6 mm
Width: 19.8 mm
Thickness: 10.2 mm
Width/Thickness Ratio: 1.9
Weight: 7.2 g
Raw Material: Grey Chalcedony
Condition: Broken
Location: Tray 3

Notes: The blade is triangular in shape with generally straight sides. Weakly defined shoulders taper into the stem which contracts into a "V" shaped base. The point is thick (width thickness ratio of 1.9) and is biconvex in cross section. The tip has a small transverse break most likely from impact. Other damage noted along the edge near the left shoulder in this view. This point most closely resembles Types 8, Rossville, and 15, Piscataway-like, in Wall *et al* (1996:65,73), Rossville (Plate 26) in Ritchie (1989:46) and Rossville, Plate 120 in Kinsey (1972:434-436). Kinsey (1972:436) states Rossville is the dominant point type in the Middle Woodland Bushkill Complex in the Upper Delaware. Kraft (2001:183) notes that Piscataway points are rarely found above the Raritan River in New Jersey. Custer(2001:43,59) suggests that both Rossville and Piscataway are regional variants of the Poplar Island point.

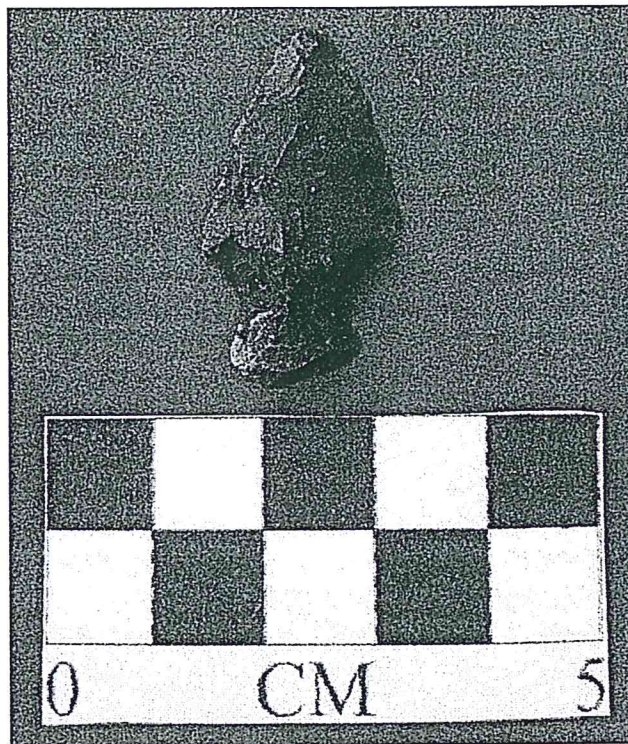


Plate 10

Artifact Type: Biface, Bare Island/Lamoka/Lamoka-like/Normanskill/Normanskill-like
Cultural/Temporal Period: Late Archaic-Early Woodland

Maximum Length: 30.2 mm

Width: 19.6 mm

Thickness: 8.2 mm

Width/Thickness Ratio: 2.4

Weight: 3.1 g

Raw Material: Black Chert

Condition: Reworked for Use as a Tool

Location: Tray 3

Notes: The bifacial blade is an asymmetrical triangle with slightly excurvate edges. It appears to have been reworked/curated perhaps losing one-third its length (Jack Cresson, personal communication). It has a center medial ridge and side notches both common to Late Archaic technology. The shoulders and tang are slightly rounded. The asymmetrical base is generally convex. It is rather thick with a width/thickness ratio of 2.4. It appears to have been manufactured on a flake and the base shows remnants of the flake platform. The tip is rounded/smoothed from use as a tool. It is similar to Type 19 (Normanskill) and Types 23A/B (Bare Island-like) specimens in Wall *et al* (1996:75-76,79-80), Normanskill and Lamoka in Ritchie (1989:29-30,37-38) and Normskill/Normanskill-like and Lamoka/Lamoka-like in Kinsey (1972:412,414-417,421-422).

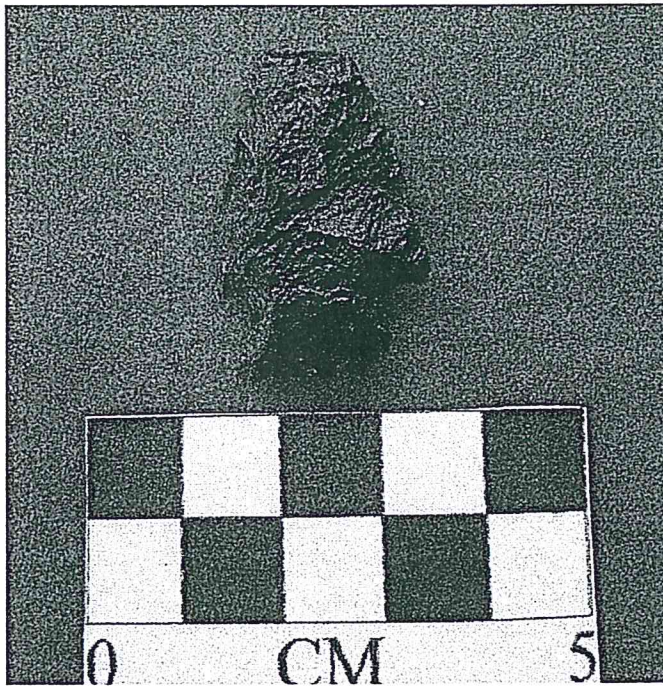


Plate 11

Artifact Type: Projectile Point, Brewerton Side-Notched
Cultural/Temporal Period: Middle-Late Archaic

Maximum Length: 32.3 mm

Width: 21.2 mm

Thickness: 8.2 mm

Width/Thickness Ratio: 2.6

Weight: 4.7 g

Raw Material: Black Chert (granular with light inclusions)

Condition: Thermally Altered, Broken

Location: Tray 3

Notes: This is a side-notched point, triangular in shape and rather thick (W/T ratio of 2.6). The edges are straight-slightly excurvate and the blade is biconvex in cross-section. Shoulders are pronounced, slightly rounded and asymmetrical. Notches are medium depth and appear to have been ground. Base is fairly straight with weak asymmetrical tangs. Tip suffered a transverse break possibly due to impact, and the left tang (this view) appears to have suffered damage. There is no evidence of reworking/resharpening or pressure flaking. High gloss suggests it was heat treated. This point resembles Brewerton Side-Notched points in Kinsey (1972:403-405). These points are the most common of the Laurentian Tradition of the Late Archaic in NY and the surrounding areas (Justice 1995:115-117; Kraft 2001:119-120; Ritchie 1989:19-20) and date from the late Middle Archaic to early Late Archaic periods.

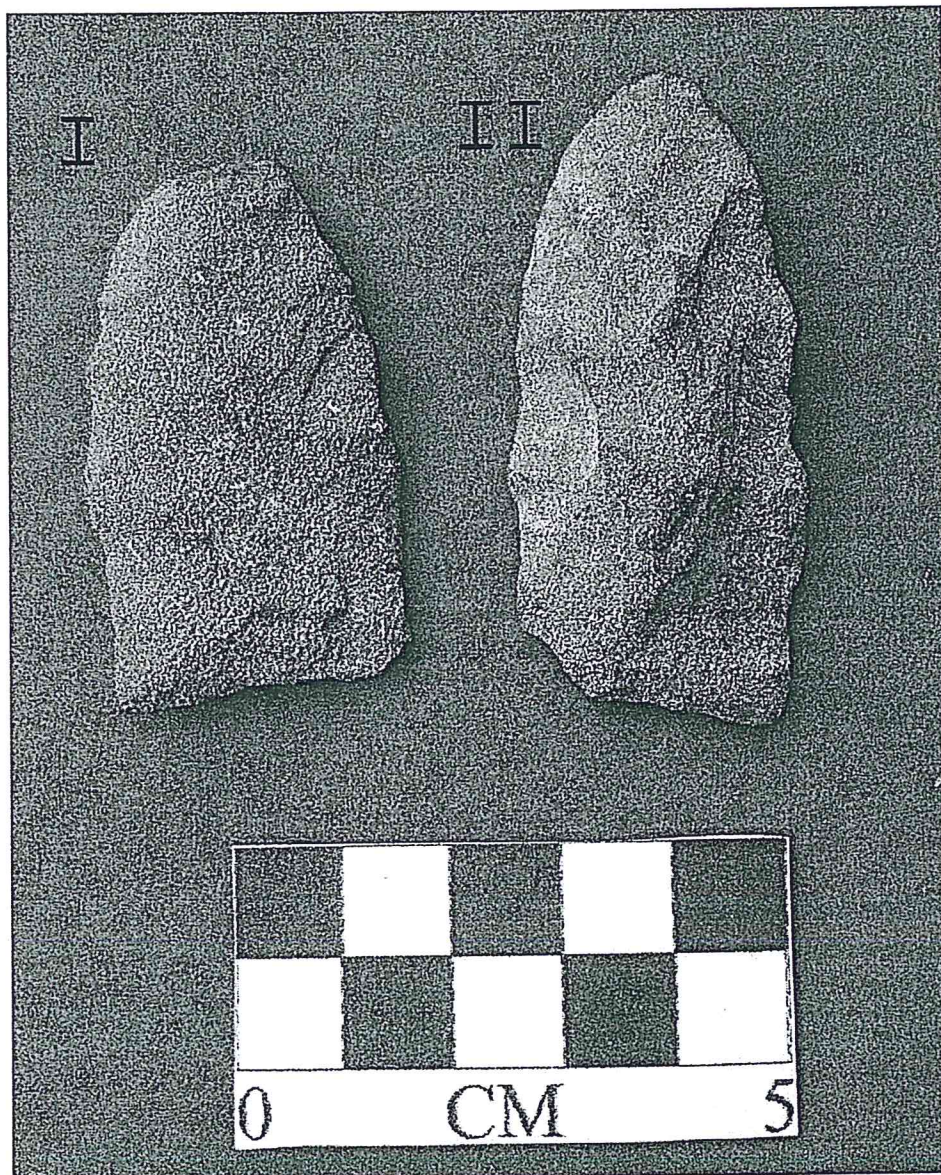


Plate 12

Biface I

Artifact Type: Biface, Fox Creek Lanceolate
Cultural/Temporal Period: Middle Woodland
Maximum Length: 48.5 mm
Width: 29.4 mm
Thickness: 6.5 mm
Width/Thickness Ratio: 4.5
Weight: 11.6 g
Raw Material: Argillite
Condition: Broken Tip
Location: Tray 2

Notes: The biface is lanceolate in shape and rather thin (W/T ratio of 4.5). Edges are excurvate to a rounded tip. The blade is biplano in cross-section and the base is straight. The tip suffered a slightly oblique break possibly caused by a plow. The broken area is fresh with no weathering

characteristic of argillite. There is no evidence of reworking/resharpening or pressure flaking. This point may be found in Custer (2001:32) and Wall *et al*(1996:63-64, Type 5A). In the Upper Delaware these points are mostly manufactured from argillite. There is some confusion in that similar points (Steubenville Lanceolate) are found in Late Archaic contexts (Ritchie 1989:50) but Fox Creek Lanceolate is well placed in the Middle Woodland by radiocarbon dating and association with Middle Woodland ceramics (Wall, *et al.* 1996:63-64). Kraft (2001:185) suggests these bifaces may have been used as either spear points or knives depending on the hafting.

Biface II

Artifact Type: Biface, Fox Creek Lanceolate
Cultural/Temporal Period: Middle Woodland
Maximum Length: 57.3 mm
Width: 26.9 mm
Thickness: 8.8 mm
Width/Thickness Ratio: 3.1
Weight: 13.0 g
Raw Material: Argillite
Condition: Whole
Location: Tray 3

Notes: The biface is lanceolate in shape but thicker than Biface I (W/T ratio of 3.1). The edges are excurvate to a rounded tip. The blade is biplano in cross-section and the base is straight. The tip also suffered a slightly oblique break possibly caused by a plow. This biface exhibits the weathering characteristic of argillite except on the damaged tip. There is no evidence of reworking/resharpening or pressure flaking. This point may be found in Custer (2001:32) and Wall *et al*(1996:63-64, Type 5A). In the Upper Delaware these points are mostly manufactured from argillite. There is some confusion in that similar points (Steubenville Lanceolate) are found in Late Archaic contexts (Ritchie 1989:50) but Fox Creek Lanceolate is well placed in the Middle Woodland by radiocarbon dating and association with Middle Woodland ceramics (Wall, *et al.* 1996:63-64). Kraft (2001:185) suggests these bifaces may have been used as either spear points or knives depending on the hafting.

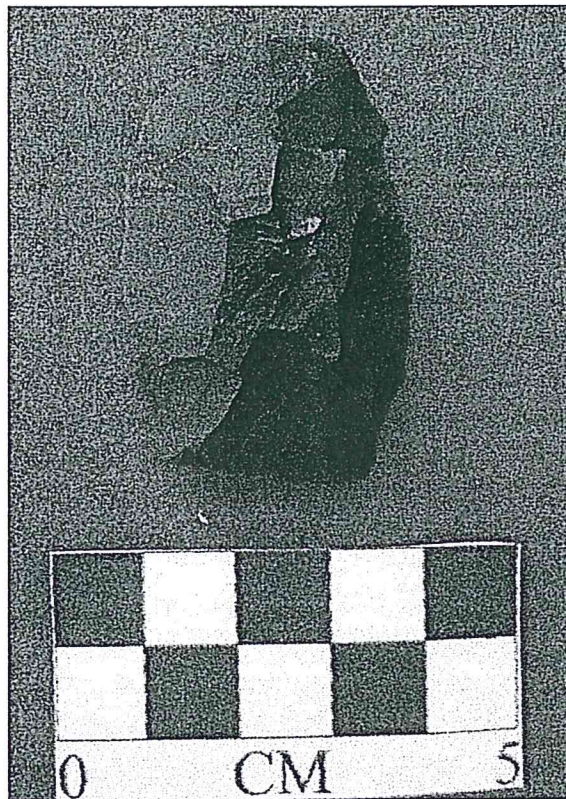


Plate 13

Artifact Type: Biface, Thinned
Cultural/Temporal Period: Unknown
Maximum Length: 44.2 mm
Width: 30.4 mm
Thickness: 14.6 mm
Width/Thickness Ratio: 2.1
Weight: 30.6 g
Raw Material: Black Chert
Condition: Broken
Location: Tray 3

Notes: This piece is lanceolate in shape and rather thick (W/T ratio of 2.1). The edges are excurvate to a rounded tip. The blade is biconvex in cross-section. The base suffered a slightly oblique break across the blade, most likely in manufacture. It appears to have been manufactured solely by percussion flaking. This biface was likely to have been discarded after the breakage. There is no evidence of usewear or modification as a tool. No determination can be made as to the intent of the knapper as far as type is concerned. This objective piece fits Callahan's (1979:Figure 1) Stage 3 (Primary Thinning) of reduction with the complete edging, removal of all cortex, and flake scars to the center of piece. The black chert is similar to other specimens in the collection which is thought to be derived from the Valley and Ridge province.



Plate 13

Biface I

Artifact Type: Biface, Triangular, Distal Portion

Cultural/Temporal Period: Unknown

Maximum Length: 28.9 mm

Width: 15.7 mm

Thickness: 5.9 mm

Width/Thickness Ratio: 2.7

Weight: 2.6 g

Raw Material: Black Chert

Condition: Broken

Location: Tray 6

Notes: This specimen is triangular in shape and somewhat thick (W/T ratio of 2.7). The edges are slightly excurvate and the blade is biconvex in cross-section. This objective piece suffered a transverse break that separated it from the base as well as an oblique break on the left edge (this view). There is no evidence of reworking/resharpening or pressure flaking. The tip did not suffer any damage from impact. Given the thickness, it is most likely this piece was broken in manufacture rather than through usage. This point fragment potentially may be the distal portion of a number of point types including Late Woodland Triangles.

Biface II

Artifact Type: Biface, Triangular, Distal Portion

Cultural/Temporal Period: Unknown

Maximum Length: 27.7 mm

Width: 19.7 mm

Thickness: 7.3 mm

Width/Thickness Ratio: 2.7

Weight: 3.9 g

Raw Material: Black Chert

Condition: Broken Tip

Location: Tray 6

Notes: This piece is triangular in shape, asymmetrical and somewhat thick (W/T ratio of 2.7). The edges are fairly straight and the blade is biconvex in cross-section. The objective piece suffered a transverse break that separated it from the base. It appears that pressure flaking was applied to the edges. The tip exhibits signs of usewear in the form of polish and rounding. The piece may have functioned in some capacity as a drill or some boring function. It is most likely this piece was broken in manufacture and utilized afterwards. This point fragment potentially may be the distal portion of a number of point types including Late Woodland Triangles.

Biface III

Artifact Type: Biface, Triangular, Proximal Portion

Cultural/Temporal Period: Unknown

Maximum Length: 28.6 mm

Width: 20.6 mm

Thickness: 4.9 mm

Width/Thickness Ratio: 4.2

Weight: 3.6 g

Raw Material: Dark Brown Chert

Condition: Broken

Location: Tray 6

Notes: This specimen is triangular in shape and rather thin (W/T ratio of 4.2). The edges are fairly straight and the blade is biconvex in cross-section. This objective piece suffered a transverse break that separated it from the tip. It appears that pressure flaking was applied to the edges to sharpen it. The base was not completely thinned for hafting. It is most likely this piece was broken in manufacture. There is no evidence of usewear to indicate it may have been seen life as a tool after breakage. This point fragment could be the basal portion of a number of point types but most likely a late stage Late Woodland Triangle (see Wall, *et al.* 1996:Plate 32).

Biface IV

Artifact Type: Biface, Triangular, Distal Portion

Cultural/Temporal Period: Unknown

Maximum Length: 35.2 mm

Width: 20.1 mm

Thickness: 6.3 mm

Width/Thickness Ratio: 3.2

Weight: 4.3 g

Raw Material: Black Chert

Condition: Broken

Location: Tray 6

Notes: This piece is triangular in shape and somewhat thick (W/T ratio of 3.2). The edges are fairly straight and the blade is biconvex in cross-section. This objective piece suffered a transverse break that separated it from the base. There is damage apparent on the tip and the edges appear to have been pressure flaked. It seems likely this piece was broken by impact (see Titmus and Woods 1986:Table 2). This point fragment may be the distal portion of a number of point types including Late Woodland Triangles.

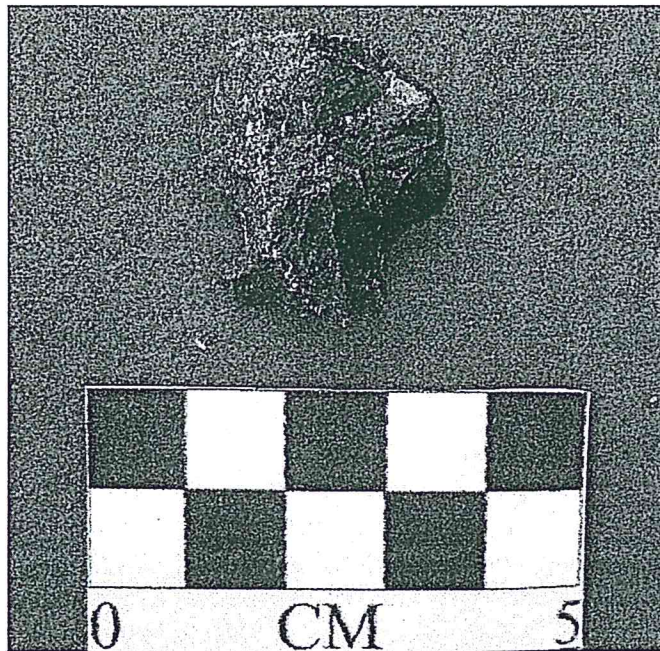


Plate 14

Artifact Type: Projectile Point, Fishtail Variant, Basal and Medial portion
Cultural/Temporal Period: Late Archaic-Early Woodland periods

Maximum Length: 27.2 mm

Width: 24.6 mm

Thickness: 10.0 mm

Width/Thickness Ratio: 2.5

Weight: 6.3 g

Raw Material: Black Chert

Condition: Broken and Reworked for Use as Tool

Location: Tray 6

Notes: This specimen possesses a triangular blade on a shallow notched stem with weak shoulders which form an oblique angle through the notch. The edges appear to be straight and the shoulders are slightly rounded as is the tang. The blade is biconvex in cross-section. The asymmetrical base is generally convex and thinned. The piece is rather thick with a width/thickness ratio of 2.5. There is no evidence of pressure flaking on the edges or base. The piece suffered a transverse break. The distal portion was reworked for use as a scraper which cannot be seen in this view. Usewear is visible under magnification. The piece was manufactured from rotten black chert with inclusions and interstices which are visible to the naked eye. This point is similar to Type 10A in Wall *et al* (1996:66-67, Plate 23) and the Orient Fishtail as described by Kinsey (1972:432-433, Fig. 119A). Both of these studies suggest that their use spans the later Late Archaic/Terminal Archaic and the Early Woodland periods. This point is very similar to Fishtail points reworked into scrapers shown in Kraft (2001:154, Figure 5.5).

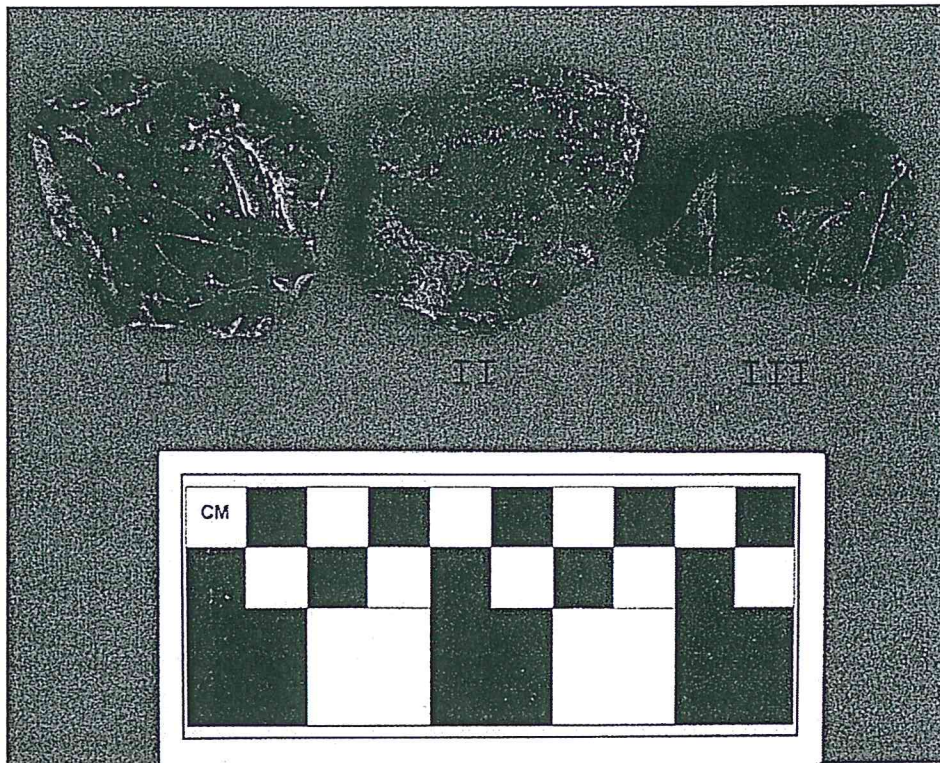


Plate 15

Scraper I

Artifact Type: Scraper

Cultural/Temporal Period: Paleo-Indian to Late Woodland periods

Maximum Length: 57.2 mm

Width: 40.3 mm

Thickness: 15.3 mm

Weight: 29.6 g

Raw Material: Black Chert

Condition: Whole

Location: Tray 7

Notes: This piece was manufactured on a flake. It possesses a steep edge angle ($>60^\circ$). There is observable damage to the working edge. Small flakes were removed to make working edge, most likely by pressure flaking.

Scraper II

Artifact Type: Scraper

Cultural/Temporal Period: Paleo-Indian to Late Woodland periods

Maximum Length: 49.0 mm

Width: 45.1 mm

Thickness: 12.5 mm

Weight: 32.4 g

Raw Material: Black Chert

Condition: Whole

Location: Tray 7

Notes: This specimen was manufactured on a flake. It has a steep edge angle ($>60^\circ$). There is observable damage to the working edge which appears to have been created through percussion flaking.

Scraper III

Artifact Type: Scraper

Cultural/Temporal Period: Paleo-Indian to Late Woodland periods

Maximum Length: 44.5 mm

Width: 29.1 mm

Thickness: 15.2 mm

Weight: 18.8 g

Raw Material: Black Chert

Condition: Whole

Location: Tray 7

Notes: The piece was manufactured on a flake. The working edge angle is rather steep ($>60^\circ$). There is observable damage to the working edge which appears to have been created through percussion flaking.

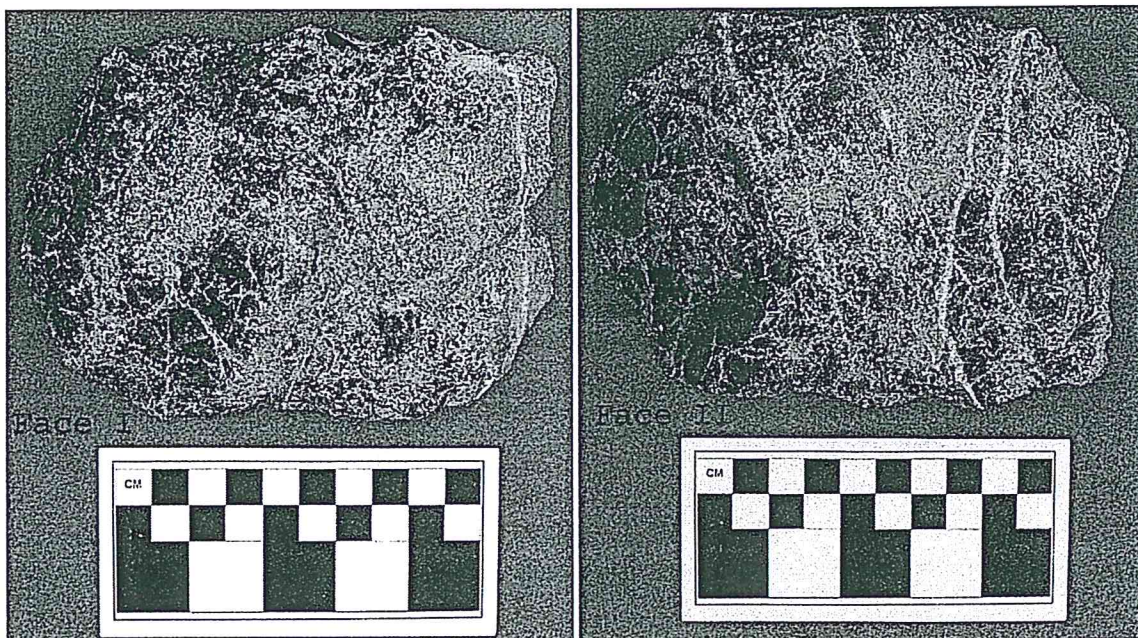


Plate 16: View of two faces.

Artifact Type: Core/Cutting/Scraping/Chopping Tool

Cultural/Temporal Period: Paleo-Indian to Late Woodland periods

Length: 14.0 cm

Width: 9.5 cm

Thickness: 4.85 cm

Circumference: 45.0 cm

Weight: .793 kg

Raw Material: Black Chert

Shape: Rectangular (ax shaped)

Notes: This specimen is a bifacially flaked tool in a generalized ax shape. One edge has a steep angle (50°-70°) to form a working edge (left edge in Plate 16). Crushing is visible with the naked eye along this edge. It could possibly have been hafted but there is no apparent smoothing suggestive of hafting on either face. The piece fits the hand well, especially if cushioned with a piece of leather. There is crushing visible on the parallel edges (top and bottom of views in Plate 16). The piece is made from a piece of rotten chert with inclusions, hollow interstices and quartz veins. Pieces of a similar form are noted from the Abbott Farm National Historic Landmark (Wall, *et al.* 1996:45-46) and in a Late Archaic component of the Harry's Farm site (Kraft 1975:32,46). Both Fowler (1991:38) and Hranicky (2002:64) note bifacially chipped choppers among the artifact types found in New England and Virginia respectively.

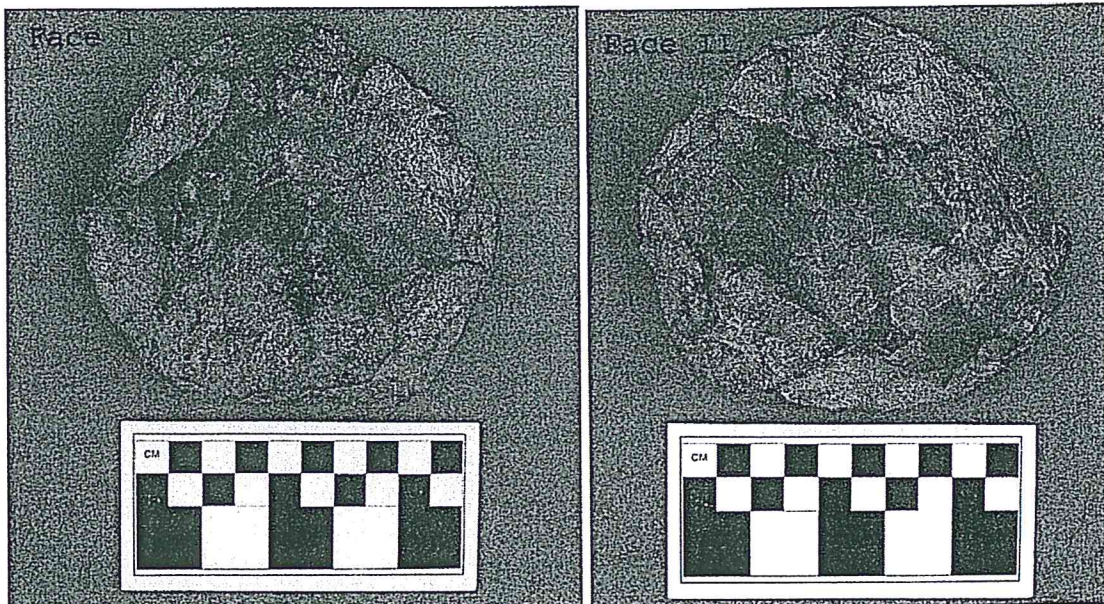


Plate 17: Views of two faces.

Artifact Type: Multidirectional Core

Cultural/Temporal Period: Paleo-Indian to Late Woodland periods

Maximum Linear Dimension: 12.0 cm

Other Axis Dimension: 10.5 cm

Circumference: 34.5 cm

Weight: .623 kg

Raw Material: Black Chert

Shape: Discoidal

Notes: This core was bifacially flaked by hard hammer percussion. Edge damage appears along the circumference of the piece but there is no evidence of edge sharpening. It possibly served as a tool later in its life. There appears to be intentional smoothing on both faces of the piece in the center where the flake scars terminate. Most likely it was used to provide flakes for use as tools and perhaps later the piece itself was used as a cutting/chopping tool prior to discard. This type of core is discussed and illustrated in Andrefsky (1998:144, Figure 7.8). Wall *et al* (1996:39) report that bifacial cores from the Abbott Farm Historical Landmark exhibit edge damage which suggest secondary use as tools.

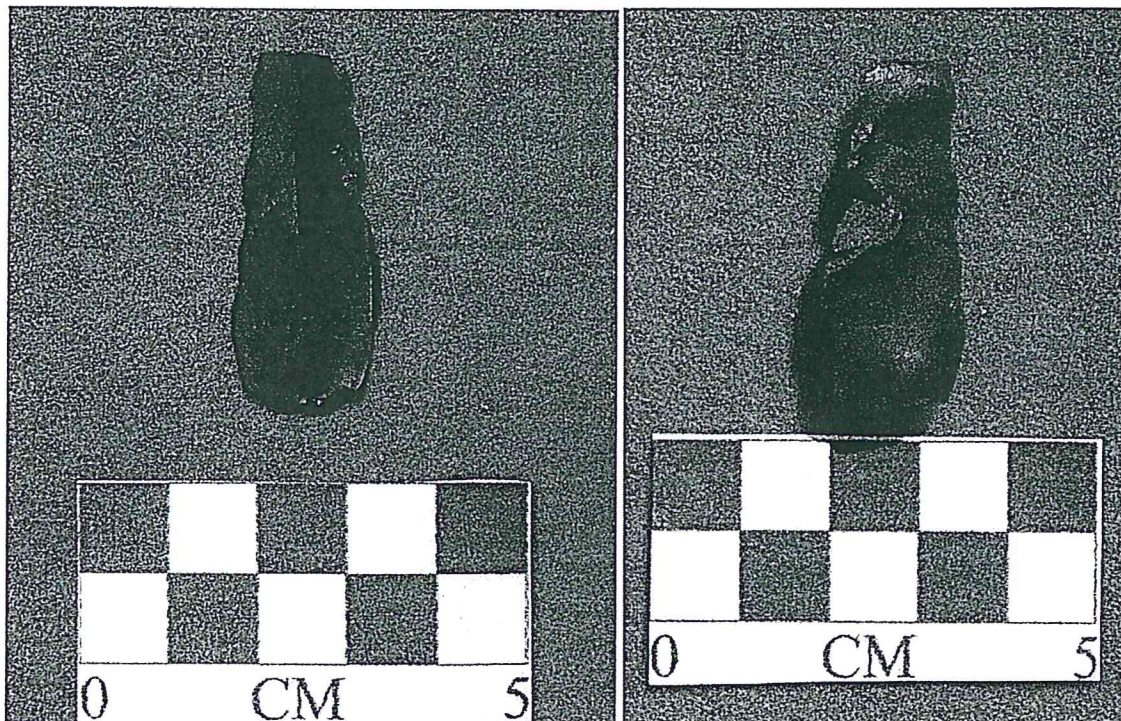


Plate 18: Views of dorsal and ventral surfaces respectively.

Artifact Type: Bladlet/Prismatic Blade/Flake

Cultural/Temporal Period: Paleo-Indian to Late Woodland periods

Maximum Length: 38.5 mm

Width: 15.8 mm

Thickness: 4.5 mm

Weight: 3.0 g

Raw Material: Black Chert

Condition: Whole

Location: Tray 8

Notes: The blade is triangular in cross-section with a single arris. The edges of the blade are fairly parallel and the length is more than twice the width. There is evidence of edge damage along both edges but there is no apparent intentional modification to this piece. The proximal or lower portion in this view shows damage from the original detachment. The platform is flat with some crushing indicating the point of impact. The proximal end (ventral view) shows a pronounced bulb of percussion with a more diffuse bulb and compression rings at the distal end, which is often found in bipolar reduction (Andrefsky Jr. 1998:118-120). Prismatic blades are removed from specially prepared cores. The objective of this technique is to produce blades which are roughly parallel sided. The blades are often worked on one edge and hafted. These artifacts are referred to as microblade tools (Andrefsky Jr. 1998:161, Figure 7.17), although this piece is rather large to fit that category and the edges are unmodified. Blades were recovered from Area B of Abbott Farm (Wall, *et al.* 1996:29-34, Plate 35) in larger numbers than most Delaware River sites. This specimen is within the size range reported by Stewart (1987:Table 2) for Abbott Farm in the Middle/Late Woodland periods as well as the Harry's Farm site in the Late Woodland period (Kraft 1975:94, Figure 65). Gramly (1996:49) reports prismatic type blades are fairly common on fluted point sites of the Paleo-Indian period. Flakes of this size and shape may be just a fortuitous byproduct of multi-directional core reduction (Jack Cresson,

personal communication). The parent core from which this specimen was struck was not found in the collection nor have any similar specimens been recovered. The presence of this artifact is at least an indication that the blade production technique was practiced at the site (Jack Cresson, personnel communication).

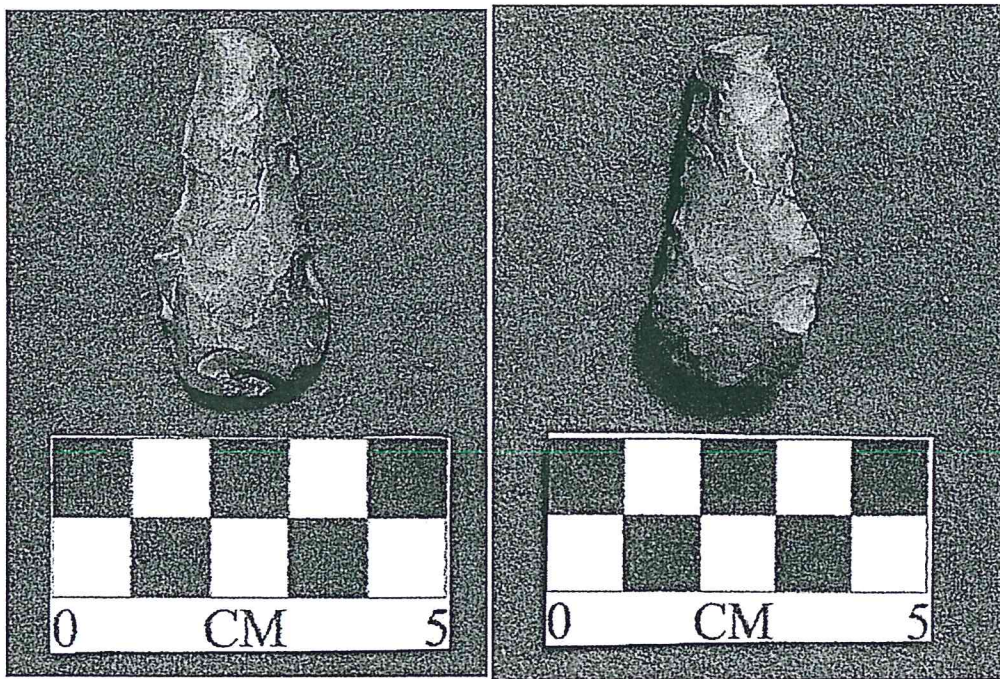


Plate 19: View of the two faces of specimen.

Artifact Type: Drill/Reamer

Cultural/Temporal Period: Paleo-Indian to Late Woodland periods

Maximum Length: 44.7 mm

Width: 10.4 mm

Thickness at Base: 8.6 mm

Thickness at Tip: 8.5 mm

Greatest Thickness: 9.5 mm

Weight: 10.4 g

Raw Material: Grey Chert

Condition: Broken

Location: Tray 8

Notes: This specimen was manufactured on a flake blank. It was bifacially flaked, most likely by a combination of percussion and pressure flaking techniques, which may be seen in both views (Plate 19). The tip appears to be broken (note flake scar emanating from tip with step fracture first view) with significant smoothing and rounding on the edges. It is well patinated suggesting great age (Jack Cresson, personal communication). Its initial function may have been as a drill or perforator, then broken in use and later modified for employment as a reamer or specialized scraper/shaver. Fowler (1991:29, Plate 5) classified these thicker shafted tools as Pipe Reamers which he inferred were used to ream out wooden or stone bowls. Most interestingly, this artifact resembles the reamers found on Paleo-Indian sites (Gramly 1996:52, figure 65) which are also bifacially flaked. The raw material is non-local and resembles Normanskill chert found in southeastern New York (Jack Cresson, personal communication).

Cobble Stone Artifacts

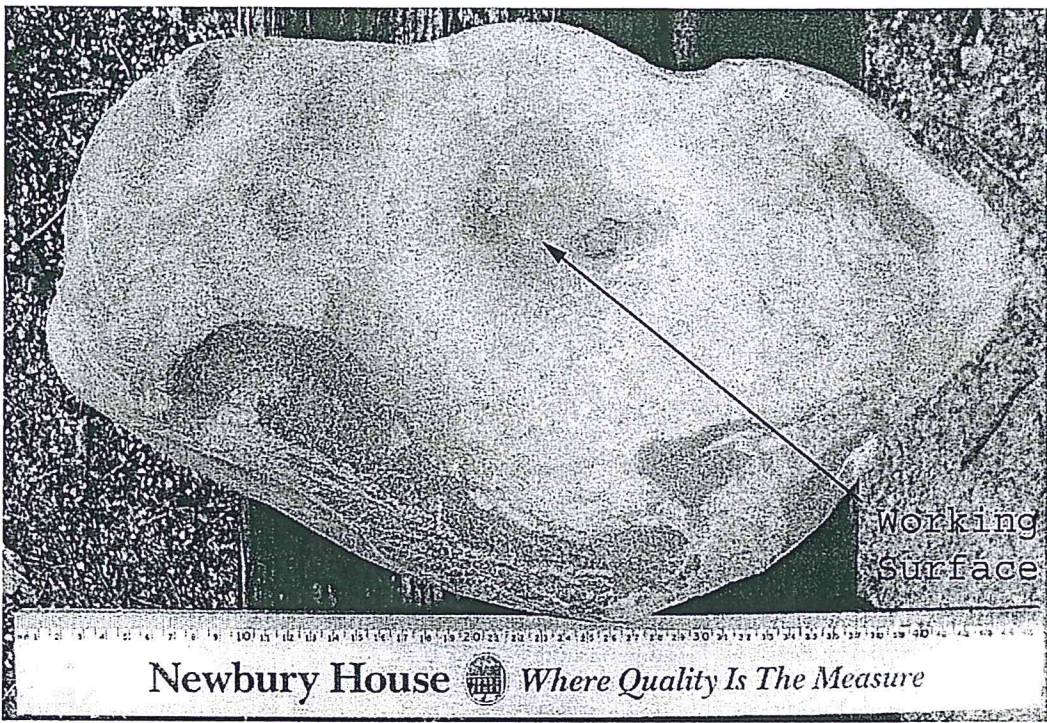


Plate 20

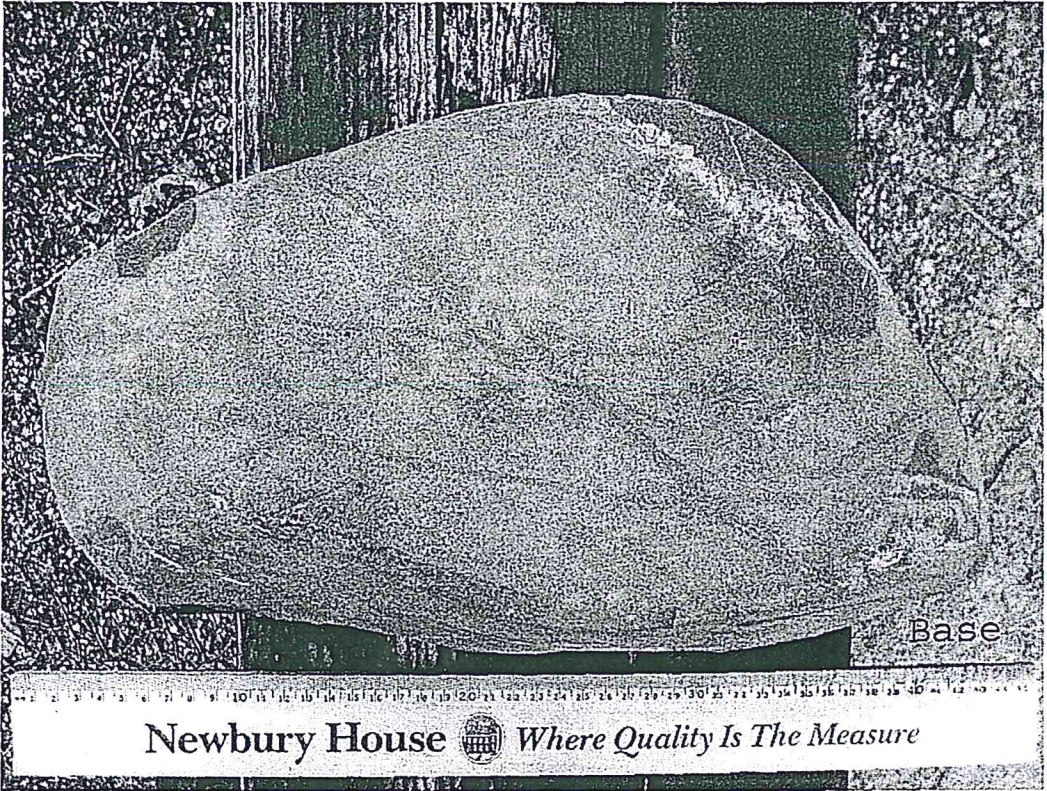


Plate 21

Artifact Type: Mortar
Cultural/Temporal Period: Late Archaic-Late Woodland periods
Maximum Length: 42.0 cm
Width: 26.0 cm
Circumference: 92 cm
Weight: 10.2 kg
Raw Material: Unknown
Condition: Damaged

Notes: The working face has a smoothed concavity generally circular in shape and approximately 10 cm in diameter. The object suffered damage, most likely from a plow, on both faces. The base is fairly flat with some smoothing apparent. Mortars are found in the Upper Delaware Valley. Kraft (2001:286, Figure 7.40) refers to these as millingstones or mortars. Fowler (1991:66, Plate 17) refers to these items as mortars. Due to the weight of this item it was likely "site furniture", which was left in place for use over several years. This specimen was found within 30-80 cm of the grinder/muller shown in Plate 22 (Les Guile, Personnel communication).

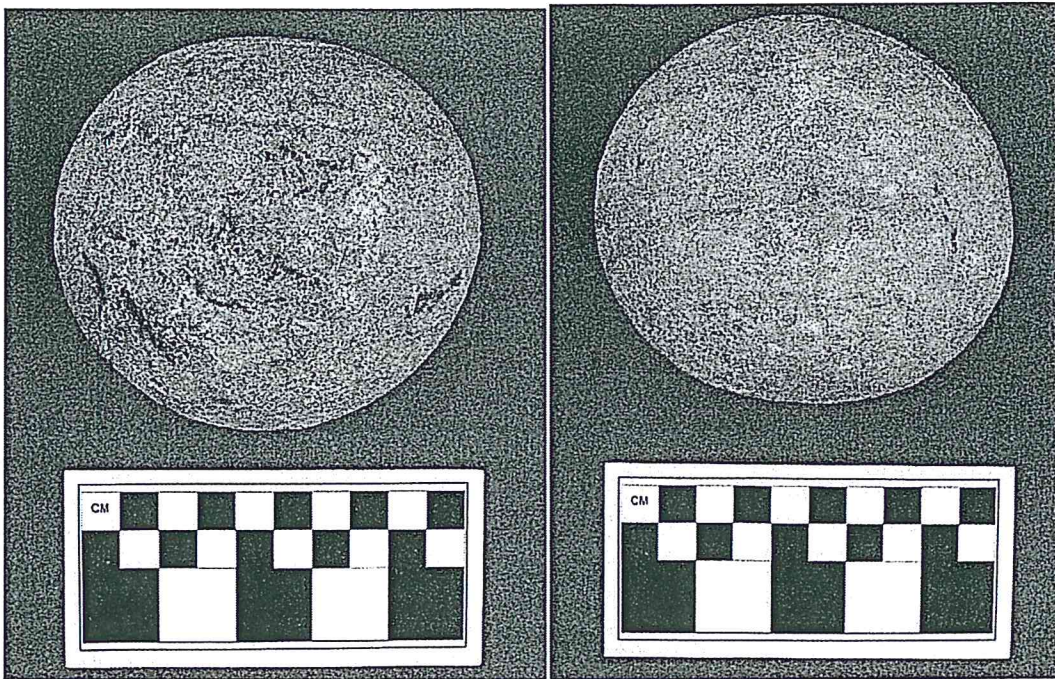


Plate 22: Opposite faces shown.

Artifact Type: Muller/Grinding Stone

Cultural/Temporal Period: Late Archaic-Late Woodland periods

Maximum Length: 10.0 cm

Width: 9.5 cm

Circumference: 30.0 cm

Weight: 1.6 kg

Raw Material: Quartzite

Condition: Usewear on all surfaces

Notes: Softball sized object with evident smoothing on all surfaces. The stone appears to have quartz inclusions. There is evidence of minor plow damage. The piece fits in the hand comfortably. It matches well with the depression on the working face of the mortar shown in Plate 21. The smoothing and scratches on the specimen indicates it was used for grinding rather than pounding. Indentations on both faces may possibly be the result of use as an anvil. The object was found within 30-80 cm of the mortar in Plates 21 and 22 (Les Guile, personal communication). Similar items may be found in Fowler (1991:63,Plate 16) and Kraft (1975:96,Figure 66)

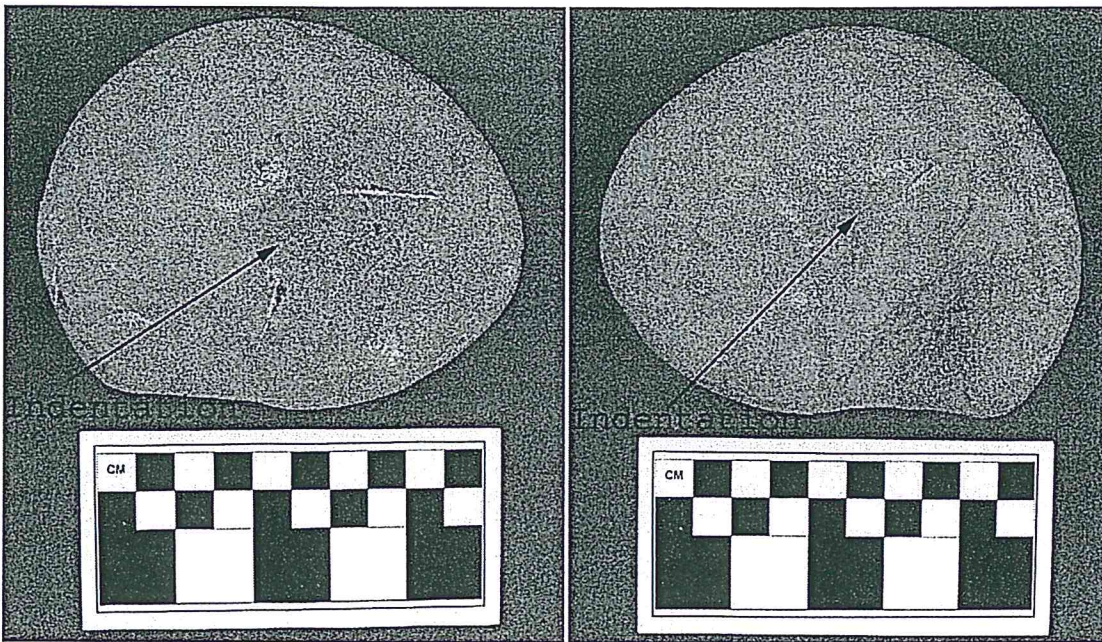


Plate 23: Opposite faces shown.

Artifact Type: Pitted Poundingstone/Grinding stone

Cultural/Temporal Period: Late Archaic-Late Woodland periods

Maximum Length: 11.5 cm

Width: 9.0 cm

Circumference: 33.5 cm

Weight: .75 kg

Raw Material: Sandstone

Condition: Usewear

Notes: This specimen has a rounded edge and an irregularly shaped edge. A semi-circular indentation on each face appears to have been pecked out. The object fits the hand well, and the index finger and thumb naturally fit into the indentations if held with the irregular edge against the palm. Both surfaces are somewhat flat. Damage in the form of crushing appears on the rounded edge (24 cm) with no apparent signs of use along irregular edge. The indentations may have been used in nutting activities. Both Kraft (2001:117-118, Figure 4.39) and Fowler (1991:61,66, Plates 14 and 16) recognize this type of implement as a pitted stone but the usewear pattern suggests it was used primarily for grinding. It is possible the piece was used for both purposes.

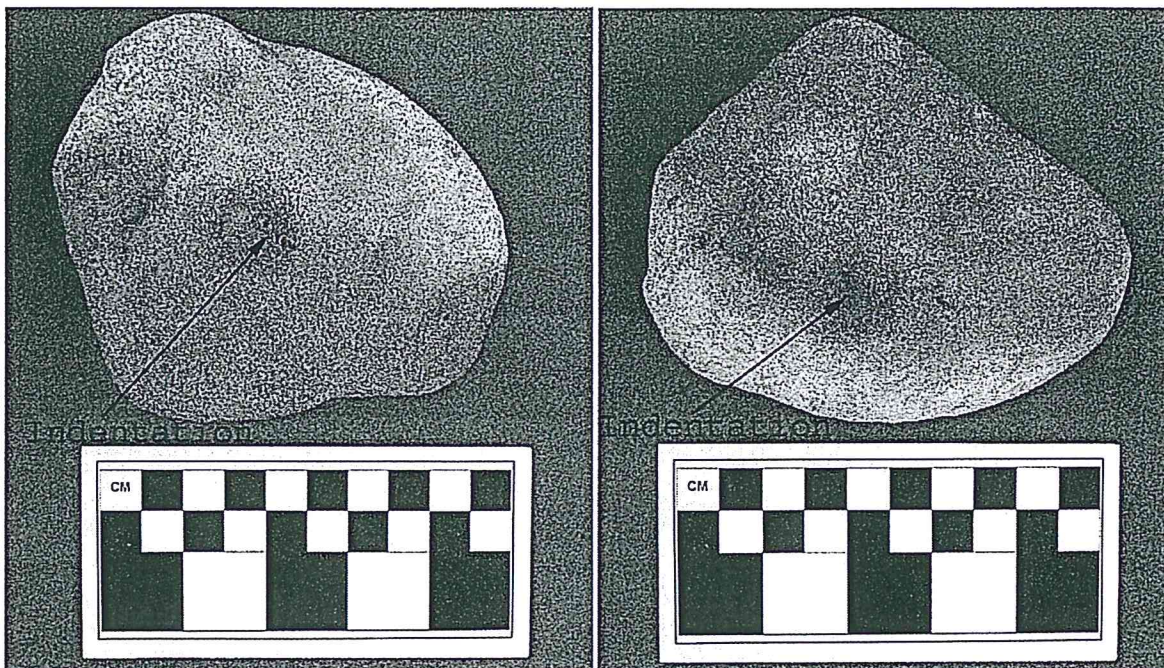


Plate 24: Opposite faces shown.

Artifact Type: Pitted Poundstone

Cultural/Temporal Period: Late Archaic-Late Woodland periods

Maximum Length: 11.0 cm

Width: 8.5 cm

Circumference: 34 cm

Weight: .43 kg

Raw Material: Sandstone

Condition: Whole

Notes: This specimen is an irregularly shaped stone, which is flat on one face (left) and somewhat convex on the opposite face (right). There are pecked indentations on both faces. There appears to be little to no damage or smoothing along the edges. The object fits the hand well and the thumb and index finger fit into indentations when held with flat edge against the palm. Indentations are evidently pecked into the surface. This artifact is similar to the one shown in Plate 23. The indentations may have been used in nutting. Both Kraft (2001:117-118, Figure 4.39) and Fowler (1991:61,66, Plates 14 and 16) recognize this type of implement as a pitted stone. The lack of usewear along the edges suggests it was not used for grinding or pounding.

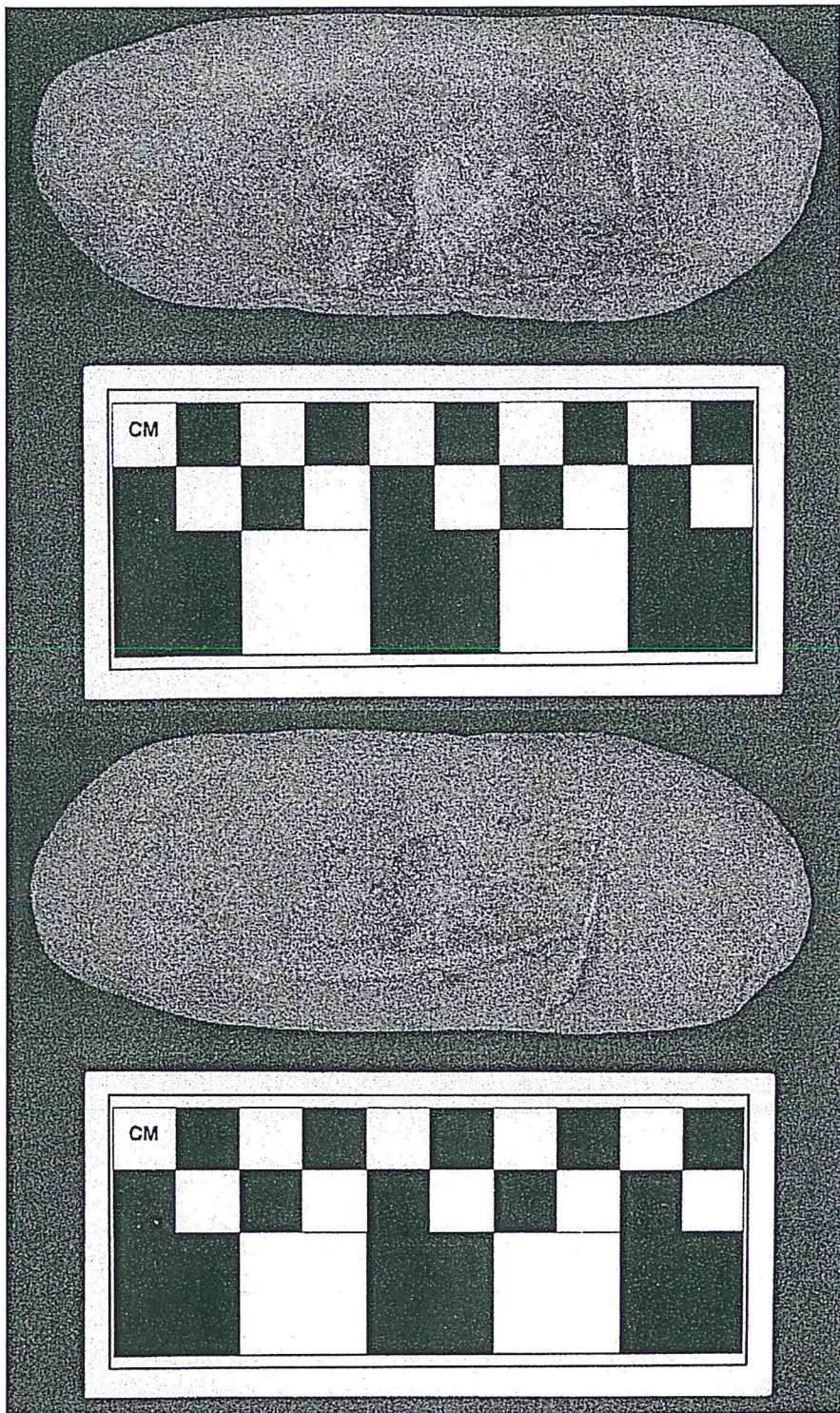


Plate 25: Opposite faces shown.

Artifact Type: Pestle or Elongated Pebble Tool

Cultural/Temporal Period: Late Archaic-Late Woodland periods

Maximum Length: 11.5 cm

Width: 4.5 cm

Circumference: 28.0 cm

Weight: .20 kg

Raw Material: Sandstone

Condition: Damaged

Notes: Elongated cobble tool with smoothing along all surfaces and some crushing on both ends. It is somewhat circular in cross-section which gives the artifact a general cylindrical shape. Plow damage is evident in the form of linear grooves on both views above. Kraft (2001:113) notes that pestles are often made from long cobbles of material such as sandstone. However, a class of cobble artifacts he terms elongated pebble tools is attributed to the Late Woodland Period. He suggests these tools were used as abraders or flaking tools with smoothing and damage on the ends (Kraft 1975:107-108, Figure 69). It appears most likely that the artifact was used as an abrader or polishing tool rather than a flaking tool.

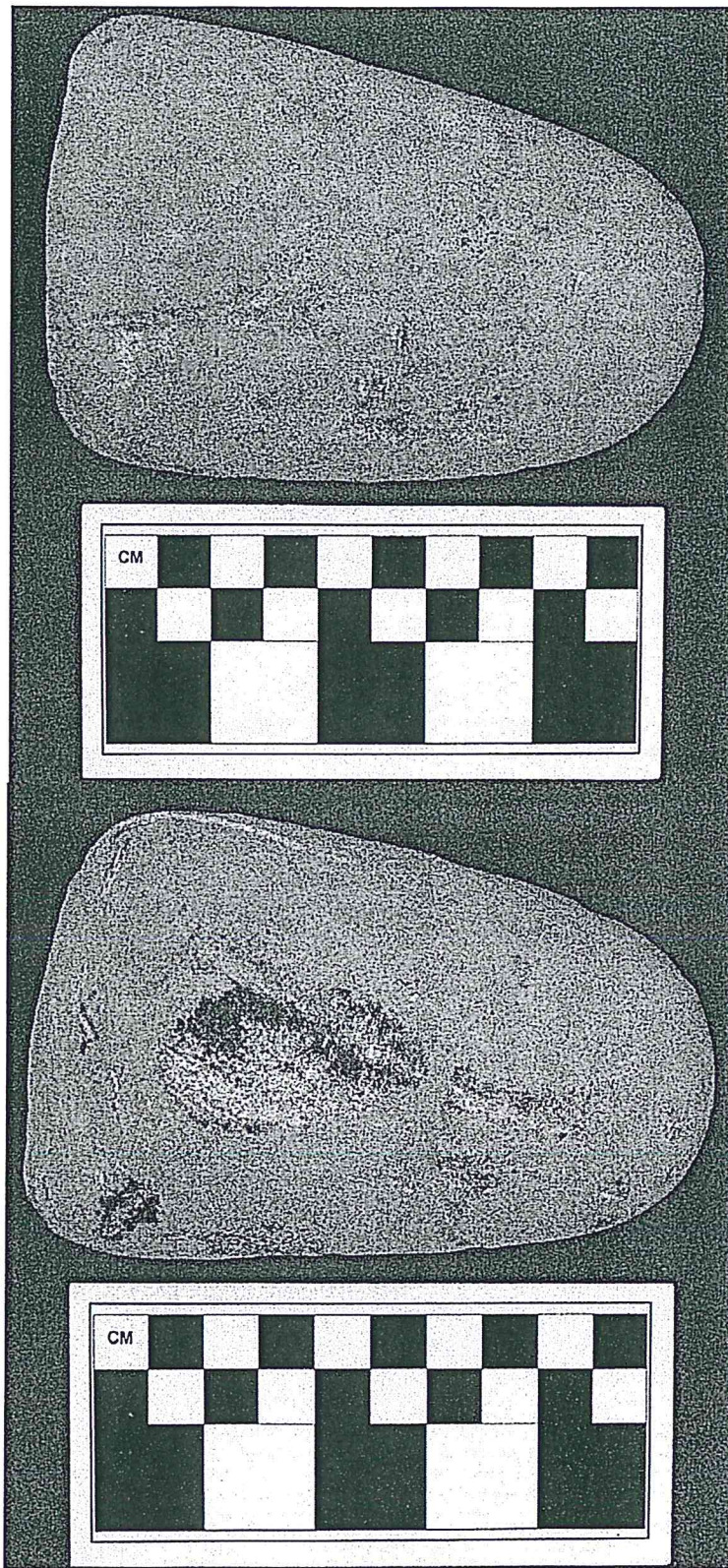


Plate 26

Artifact Type: Elongated Pebble Tool (smoother or abrader)
Cultural/Temporal Period: Late Archaic-Late Woodland periods
Maximum Length: 11.7 cm
Width: 7.0 cm
Circumference: 31.5 cm
Weight: .65 kg
Raw Material: Sandstone
Condition: Damaged

Notes: Elongated cobble which possesses an overall cone shape. One end is flat and smooth (left side in view above) while the opposite end is rounded and smoothed. One face of the implement is fairly flat and smoothed (upper picture in Plate 26). The object fits the hand well. Plow damage is easily visible on both faces. As in the implement in Plate 25, this artifact may have had many uses but most likely it is an elongated pebble tool used to smooth or abrade (Kraft 1975:107-108, Figure 69).

Conclusions

Generally, it appears that the site was utilized by the indigenous inhabitants of this area from the late Middle Archaic period (5,000 BC) to the Late Woodland period (1600 AD). This time range is derived from well dated projectile point types from the Delaware Valley indentified in the collection. However, some of the artifact types were utilized from the Paleo-Indian period (10,000 BC) through the Late Woodland period but are not diagnostic of any one cultural period. These artifacts are noted in the report. Especially intriguing are the prismatic-type blade and reamer shown in Plates 18 and 19 respectively, which greatly resemble types found in Paleo-Indian sites in the Northeast (Gramly 1996). Partially completed bifaces from the collection (Plates 1, 4, 8 and 13) as well as debitage recovered during field school excavations strongly suggest that chipped stone tool manufacture took place on the site. In addition, two of the projectile points (see Plates 2 and 11) show evidence of intentional heat treatment to improve the flaking properties of stone (Luedtke 1992:91-92). At least two of the specimens display evidence of reworking/resharpening (see Plates 10 and 14). Projectile points used to kill game and scrapers often used to process animal hides, point to hunting as a major site activity. Some of the cobble artifacts indicate that site inhabitants processed plant type materials for food such as nuts, seeds or maize. All of this is consistent with well documented activities in the region (Kinsey 1972; Kraft 1975). The length of any one occupation episode cannot yet be determined, although the heavy non-transportable mortar shown in Plates 20 and 21 suggest, at the least, that the site may have been reused over time.

It highly likely that the black chert, from which the large majority of the artifacts were made came from a myriad of sources in the region including local outcrops in the Paulins Kill river drainage. In the Valley and Ridge Province over 200 prehistoric chert quarries have been documented in the Wallkill River Valley of northern New Jersey and southern New York (LaPorta 1994). It is likely that the cobble tools were derived from the Paulins Kill river which flows approximately 600 meters west of the site. Black chert, in limestone outcrops, along the Paulins Kill were found by Dr Anthony Balzano, SCCC faculty and the author, in April 2014 approximately 850 meters southwest of the Walnut Grove Farm site (location information from Les Guile, personal communication). Samples were collected and the location mapped. Some of the utilized tool stone found in the collection, such as argillite (see three bifaces in Plate 12), were most likely derived from formations in the Middle Delaware valley. Several examples of non-local chert are also noted (see biface III in Plate 13 and the reamer in Plate 19). These exotic materials were either brought here by foraging groups, traded or collected by the local inhabitants from their source. Although, they may have been derived from cobble sources of chert that were deposited throughout the area as a result of the last glaciation.

Glossary of Terms

Abrader	Usually appear as pebbles/cobbles in various shapes with smooth facets produced by wear from rubbing, or with irregular grooves, thought to have been used to sharpen bone awls.
Arris	The long crest, or spine, either natural or formed by unifacial or bifacial flaking. Alternately referred to as a ridge or crest.
Biface:	A tool that is flaked on two surfaces to form an edge that circumscribes the tool.
Bipolar Technology	A technique of resting the objective piece on an anvil and striking it with a hammer to split or remove detached piece (flake).
Bulb of Percussion	The bulbar part on the ventral side (interior) at the proximal end (where percussor struck to detach flake).
Brewerton	This "Phase" is part of a larger Laurentian Tradition, a Late Archaic manifestation, first identified in Central New York. Various types of Brewerton points are found in the Upper Delaware Valley.
Bushkill	This "Complex" is an Early to Middle Woodland phenomenon found in eastern Pennsylvania and the Upper Delaware Valley. It is characterized by Rossville and Lagoon points as well as Vinnette I and stamped (decoration) pottery.
Compression Rings	Ripples or undulations on the smooth interior surface of a flake moving from the direction of where the flake was struck to detach it from the objective piece.
Detached Piece	A portion of rock removed from an objective piece by percussion or pressure. These are often referred to as flakes, spalls, chips or debitage.
Dorsal Surface	The side of a flake or detached piece that shows evidence of previous flake removals or the original surface of the rock.
Edge Angle	A measurement in degrees of the working edge of a tool or biface. Acute or sharp edge angles are found on cutting tools or projectile points while larger edge angles (>60°) are found on tools used for scraping functions.
Eshback	A triangular projectile point with basal notches which dates to the Middle Woodland period.
Fishtail	A projectile point type with shallow and broad side notches that results in a flaring stem that gives them their name. Dated to the Late Archaic-Early Woodland periods.

Flake Platform	The surface area on a detached piece that contains the area which received the force used to detach it from the objective piece.
Heat Treatment	Method of altering siliceous stone by exposure to controlled heat. It often leaves surfaces of the stone glossy or reddened (dependent on iron content). It is thought to improve the ease of knapping stone.
Karst	A basin formed by the melting of ice at the edge of glacial areas. May be referred to as thermokarsts, frost-thaw basins or pingoes. They often attracted animals and early human hunters.
Lackawaxen	A fairly large stemmed projectile point often made of argillite or shale which has been dated to the Late Archaic period.
Laurentian Tradition	It is characterized by a variety of notched and stemmed point types and adaptations to the mixed deciduous and coniferous forests and lakes of the Late Archaic of New York, New England and Pennsylvania. Its attributes are thought to have diffused into the Upper Delaware Valley.
Normanskill	A projectile point type with generally narrow isosceles triangular blades and straight sides with wide, deeply indented side notches and flaring bases. They are considered part of the Laurentian Tradition and are a Late Archaic phenomenon.
Objective Piece	The rock or artifact being modified by the removal of detached pieces. Often referred to as a core.
Pequea	A narrow bladed projectile point with an expanding stem which is dated to the Middle Archaic-Middle Woodland periods.
Percussion Flaking	A method of striking with a percussor (stone, bone, wood) to detach flakes from an objective piece.
Preform	It is an unfinished, unused form of the proposed artifact.
Pressure Flaking	The removal of a detached piece (flake) from an objective piece by a pressing force rather than percussion.
Projectile Point	A biface that contains a haft area and is used as a projectile tip. These are often identified as arrow points, dart points and spear points.
Rotten Chert	Chert which is characterized by interstices and soluble inclusions which may give it a Swiss cheese or honeycomb appearance. Generally not used to manufacture projectile points.
Scraper	A generalized term that is used to describe a flake tool that has a retouched edge angle of approximately 60 to 90 degrees. Common uses are on animal hides, wood and other vegetative materials.

Stages of Biface Manufacture	Different forms of a biface as it chipped to move from a raw material blank to a refined finished project. Analysts may describe each stage by different criteria.
Usewear	Modifications on lithic artifacts resulting from its use as a tool. It is often found on working edges of tools in the form scratches and tiny flake scars.
Ventral	The smooth inner surface of a flake that contains no scars from previous flake removals.
Width-Thickness Ratio	A measure of the relative thickness of a biface. It is obtained by dividing the linear width value by the linear thickness value. Early in the reduction sequence it might be 2.0 (4 cm/2 cm) and a finished biface a 4 or 5 (40 mm/8 mm).

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