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LITHIC ANALYSIS AND PALEO-INDIAN UTILIZATION

OF THE TWELKEMEIER SITE (4OHS173)

John B. Broster and Mark R. Norton

ABSTRACT

An analysis of lithic artifacts from the Twelkemeier site was undertaken by the Tennessee Division of Archaeology on this very important Paleo-Indian locality. A total of 116 tools was examined which probably date between 11,500 and 10,000 years B.P. Important information of tool types and lithic resource utilization was developed from this study.

Introduction

The Twelkemeier site (4OHS173) is a multi-component Paleo-Indian habitation located on a small island on Kentucky Lake. Erosion from wave action has destroyed any spacial integrity of the deposits, leaving a concentration of lithic tools and waste flakes exposed at times of low water. Mr. Herman Twelkemeier has collected materials from this site for many years, and has graciously donated his collection to the Tennessee Division of Archaeology for study. The materials consist of 18 projectile points and 98 formal tools. No waste flakes or other byproducts of lithic reduction were removed from the site. It is hoped that the Division will be able to make a systematic collection of debitage in the near future.

Early, Middle and Late (Transitional) Paleo-Indian projectile point types have been found on the site. The splitting of the Paleo-Indian Period into three phases or components, based on projectile point types, is derived from the outstanding recent research of David G. Anderson (1989:2-3). Inference for an early occupation is based upon only two Clovis preforms. Caution should be taken in assigning a Clovis component based on only two artifacts, as these could have been collected and reused by later Paleo-Indian groups. The Middle Paleo-Indian occupation, ca. 11,000 to 10,500 yrs. BP, is the most densely represented at the site. This period is defined by three Cumberland, nine Beaver Lake and five Quad projectile points. Probably most, if not all, of the uniface tools are associated with this period. The Cumberlands are believed to date earlier than the other projectile point types, and are thought to cluster around 11,000 years BP. The manufacture of Quad and Beaver Lake types probably continued into the early Late (Transitional) period. This last potential occupation is represented by only one Dalton projectile point. A date of 10,500 to 9,800 yrs. BP has been proposed for the later part of the Paleo-Indian sequence.

The site is approximately 200 meters by 100 meters in area and was originally on the first terrace overlooking the Tennessee River. Numerous Paleo-Indian sites have been collected in the immediate area, and some 16 extensive Paleo-Indian sites have been recorded within a few miles of the Twelkemeier site. The Division is currently conducting interviews with amateur archaeologists and collectors in order to record as much information on settlement/ subsistence systems of Paleo-Indian adaptation for this river valley.

An analysis of the formal attributes of the collection has been made to ascertain possible site function and the relationship of the site to other Paleo-Indian sites in the area. This site is very important, as only three other Paleo-Indian sites have been formally investigated, analyzed and published for the state (Broster 1982; Dragoo 1973; Lewis and Kneberg 1958).

Artifact Assemblage

Projectile Points:

Cumberland (Cambron and Hulse 1975:36) (Figure 1)

Sample size: 2 (An additional specimen was not available for measurements)

Description:

This is a medium to large, auriculate, fluted point displaying hafting constriction. Both of these specimens are missing the distal end. On one specimen, an auricle was resharpened into a graver tip. The other point displays a heavily ground auricle and basal edge. Cross-section: fluted. Cumberland projectile points are diagnostic of the Middle Paleo-Indian period with a proposed date of 11,000 to 10,500 years B.P.

Measurements: Length: (no complete specimen); Width: (mean 24.22 mm); Thickness: (mean 7.79 mm); Flute thickness: (mean 6.30)

Materials: Dover chert-1; Fort Payne chert-1

Beaver Lake (Cambron and Hulse 1975:10) (Figure 1)

Sample size: 9

Description:

This is a medium-sized, auriculate point with recurvate blade edges. All of the specimens in this category are fractured. Six are missing the distal end, two are missing an auricle, and one was broken in manufacture. Eight of the nine specimens are ground along the hafting constriction and basal edge. Each specimen has a flattened cross-section. This type is diagnostic of the Middle Paleo-Indian period, probably dating between 10,800 and 10,000 years B.P.

Measurements: Length: (three complete specimens) 41.09 - 96.26 mm (mean 63.95 mm); Width: 17.25 - 25.71 mm (mean 22.25 mm); Thickness: 5.00 - 7.48 mm (mean 6.16 mm)

Materials: Dover chert-7; Fort Payne chert-2

Quad (Cambron and Hulse 1975:107) (Figure 1)

Sample size: 5



Figure 1. Projectile Points. Upper Row: Cumberland, Quad, Beaver Lake; Lower Row: Beaver Lakes.

Description:

This is a medium sized, broad point with an expanded-rounded, auriculate hafting area. The hafting area is ground and constricted above the auricles. The distal end is missing from each of these points. Cross-section: flattened. This type is diagnostic of the Middle Paleo-Indian period, dating between 10,800 and 10,000 years B.P.

Measurements: Length: (no complete specimen); Width: (four specimens) 26.21 - 32.17 mm (mean 29.23 mm); Thickness: 5.74 - 7.12 mm (mean 6.29 mm)

Materials: Dover chert-4; Fort Payne chert-1

Dalton, Colbert (Cambron and Hulse 1975:37)

Sample size: 1

Description:

This is a medium sized, auriculate point with a rectangular hafting area. A portion of the base and one shoulder are missing. Cross-section: biconvex. This type is diagnostic of the Late Paleo-Indian period, dating between 10,500 and 9,800 years B.P.

Measurements: Length: 59.02 mm; Width: 25.32 mm; Thickness: 8.02 mm

Material: Dover chert

Paleo-Indian Unidentified Projectile Point

Sample size: 1

Description:

This is a medium sized, constricted base projectile point. The lateral edges near the base are heavily ground. The basal edge is missing. Cross-section: flattened. This point displays characteristics most similar to Middle to Late Paleo-Indian point types.

Measurements: Length: 56.29 mm; Width: 23.64 mm; Thickness: 6.55 mm

Material: Fort Payne chert

Bifacial Tools:

Clovis Preform: (Figure 2)

Sample size: 2



Figure 2. Clovis Preforms.

Description:

These are medium to large, fluted biface preforms. On both specimens a short, flute like thinning flake was struck off the dorsal side and two longer flutes were struck off the ventral side. Both artifacts show use wear attrition along the lateral edges. These probably date between 11,500 and 11,000 years B.P.

Measurements: Length: (mean 76.38 mm); Width: (mean 42.32 mm); Thickness: (mean 13.11 mm)

Materials: Dover chert

Preform:

Sample size: 1

Description:

This fractured preform is heavily ground along the lateral and basal edges. The snap fracture is identical to those on experimental preforms that were snapped during the fluting stage of manufacture. A Paleo-Indian association was determined for this preform.

Measurements: Length: 55.85 mm; Width: 41.29 mm; Thickness: 12.05 mm

Material: Fort Payne chert

Biface:

Sample size: 6

Description:

Several tools are represented in this category. One fragment has well defined knife and sidescraper lateral edges. One shattered biface fragment has a ground lateral edge suggesting a backed tool or preform. Two biface midsections with low angle lateral edges are possible knife fragments. Five of the six artifacts were damaged by fire.

Measurements (one complete specimen): Length: 53.51 mm; Width: 38.84 mm; Thickness: 11.31 mm

Materials: Dover chert

Drill:

Sample size: 1

Description:

This artifact is triangular in form and cross-section. The bit is elongated with an expanded base. A portion of the base and the distal end are missing. Severe pot-lidding and crazing indicate heat damage.

Measurements: Length: 43.16 mm; Width: 19.48 mm; Thickness: 8.30 mm
Material: Dover chert

Bifacial Sidescraper/Knife/Graver:

Sample size: 1

Description:

A secondary flake was thinned by oblique transverse flaking to form this tool. Use wear attrition is present along the sidescraper and knife edges. The graver tip, located on the proximal end is ground from use. The distal end retains rind from the parent material.

Measurements: Length: 57.98 mm; Width: 25.63 mm; Thickness: 7.91 mm

Material: Dover chert

Bifacial Gouge:

Sample size: 1

Description:

This is a large, thick biface with a gouge formed on the distal end. This tool may have been used as a perforator as well as a gouge. Blade edges do not show any use wear attrition.

Measurements: Length: 101.19 mm; Width: 51.92 mm; Thickness: 30.36 mm

Material: Dover chert

Uniface Tools:Triangular Endscraper/Sidescraper: (Figure 3)

Sample size: 12

Description:

The endscrapers in this tool category are semi-circular in form. Nine of these tools have the endscraper on the distal end of the flake. In each of these examples the distal end has the greatest amount of curvature. Six of the tools have light to heavy crushing on the end and sidescraper edges. The remaining tools show use wear attrition on these edges.



Figure 3. Uniface Triangular Endscraper/Sidescrapers.

Measurements (9 specimens): Length: 40.42 - 71.95 mm (mean 54.65 mm); Width: 25.14 - 49.71 mm (mean 34.39 mm); Thickness: 8.28 - 15.66 mm (mean 11.45 mm)

Materials: Dover chert

Rectangular Endscraper/Sidescraper:

Sample size: 12

Description:

Relatively large secondary flakes were utilized to form the tools in this category. Four of the specimens have a narrow endscraper. All examples exhibit some degree of step fracture crushing along working edges.

Measurements: Length: 48.00 - 100.24 mm (mean 64.54 mm); Width: 30.96 - 48.47 mm (mean 38.71 mm); Thickness: 9.32 - 22.83 mm (mean 14.42 mm)

Materials: Dover chert

Endscraper/Sidescraper on Primary Flake:

Sample size: 5

Description:

Three of the tools in this category have endscrapers at the proximal end while the remaining two are made at the distal end. The endscraper is made on the end with the most curvature. All examples exhibit light crushing along working edges.

Measurements: Length: 49.62 - 72.14 mm (mean 59.10 mm); Width: 27.27 - 40.65 mm (mean 32.18 mm); Thickness: 7.13 - 10.56 mm (mean 8.95 mm)

Materials: Dover chert

Blade Knife/Sidescraper: (Figure 4)

Sample size: 13

Description:

These tools were made on selective secondary flakes from polyhedral core manufacture. These flakes commonly have one relatively steep angled lateral edge and one lower angled lateral edge. The tools in this category have step fracture crushing along the steep angled lateral edge (sidescraper) and fine attrition wear along the lower angled lateral edge (knife).

Measurements: Length: 61.25 - 104.53 mm (mean 80.23 mm); Width: 22.66 - 46.97 mm (mean 35.01 mm); Thickness: 5.09 - 16.43 mm (mean 11.08 mm)

Materials: Dover chert



Figure 4. Uniface Blade Knife/Sidescrapers.

Uniface Sidescraper:

Sample size: 6

Description:

The tools in this category are much like other sidescrapers from this assemblage. The lateral edges are relatively steep and exhibit step fracture crushing. Four of the six specimens show signs of heat alteration.

Measurements: Length: 53.67 - 121.17 mm (mean 78.58 mm); Width: 27.38 - 45.32 mm (mean 36.62 mm); Thickness: 9.40 - 21.54 mm (mean 14.57 mm)

Materials: Dover chert

Sidescraper/Beak:

Sample size: 7

Description:

This tool category consists of flakes with sidescrapers on the lateral edges and a beak on the distal (6 specimens) or proximal (1 specimen) end. The sidescraper edges exhibit light to heavy crushing. Use wear attrition is present on beak edges. Irwin and Wormington (1970:30) defined beaks as "implements resembling spurs, but they are thicker and are shaped rather like a birds bill...they may have been perforators and groovers, but they could also have served for ripping".

Measurements (6 specimens): Length: 52.00 - 83.45 mm (mean 71.90 mm); Width: 25.42 - 44.89 mm (mean 33.02 mm); Thickness: 9.40 - 15.30 mm (mean 12.48 mm)

Materials: Dover chert

Sidescraper/Graver: (Figure 5)

Sample size: 5

Description:

Four tools of this type are complete with one graver tip fragment. Three of the tools exhibit heavy crushing on the lateral edges. Microscopic analysis of the graver tips revealed a ground appearance on the ventral leading edge.

Measurements: Length: 54.70 - 85.70 mm (mean 73.82mm); Width: 32.80 - 40.70 mm (mean 34.67 mm); Thickness: 7.32 - 11.54 mm (mean 9.81 mm)

Materials: Dover chert

Sidescraper/Gouge:

Sample size: 1



Figure 5. Uniface Sidescraper/Gravers.

Description:

This tool is triangular in form with a gouge tip on the proximal end. Burin like flakes were removed from the distal end for probable backing purposes. The lateral edges are lightly crushed from use as a sidescraper.

Measurements: Length: 80.35 mm; Width: 40.81 mm; Thickness: 11.46 mm

Material: Dover chert

Blade Knife:

Sample size: 12

Description:

These tools show use wear attrition along the lateral edges. Eleven of the twelve examples were resharpened indicating a longer tool life than expediency tools such as flake knives.

Measurements (9 specimens): Length: 44.39 - 84.09 mm (mean 60.33 mm); Width: 24.16 - 40.31 mm (mean 32.94 mm); Thickness: 7.13 - 11.47 mm (mean 8.40 mm)

Materials: Dover chert

Flake Knife:

Sample size: 8

Description:

This tool category consists of secondary decortication flakes that were utilized as knives. Five of the eight artifacts appear to have been used as expediency tools. Three of the specimens have been resharpened.

Measurements: Length: 37.63 - 68.63 mm (mean 51.52 mm); Width: 23.40 - 44.43 mm (mean 34.69 mm); Thickness: 5.86 - 15.12 mm (mean 9.47 mm)

Materials: Dover chert

Multipurpose Tools:

Sidescraper/Knife/Graver/Spokeshave: (Figure 6)

Sample size: 3

Description:

Each of the specimens from this tool category have a spokeshave between two graver tips on the distal end of the flake. The sidescraper and spokeshave edges exhibit step fracture crushing suggesting use on a hard surface. Microscopic



Figure 6. Two Uniface Graver/Spokeshave/Sidescraper/Knives; One Uniface Endscraper/Knife/Graver.

analysis of the graver tips revealed a ground appearance. Use wear attrition is present along knife edges.

Measurements: Length: 36.42 - 65.69 mm (mean 52.37 mm); Width: 27.61 - 36.27 mm (mean 33.22); Thickness: 7.02 - 10.34 mm (mean 12.99 mm)

Materials: Dover chert

Endscraper/Knife/Graver: (Figure 6)

Sample size: 1

Description:

This tool is triangular in form with an endscraper on the distal end and a graver on the proximal end. Lateral and endscraper edges show use wear attrition. Light edge crushing is present on the right lateral edge.

Measurements: Length: 79.84 mm; Width: 23.92 mm; Thickness: 8.76 mm

Material: Dover chert

Graver/Spokeshave/Knife:

Sample size: 1

Description:

A graver and two spokeshaves were made on the distal end of this tool. A knife was made on the left lateral edge while the right lateral edge retains rind from the parent material. The spokeshave edges exhibit light step fracture crushing.

Measurements: Length: 76.43 mm; Width: 43.50 mm; Thickness: 11.04 mm

Material: Dover chert

Conclusions

The lithic assemblage presents some interesting points for discussion. The large number of uniface scraping and cutting tools lends weight to the primary use of the site as a secondary butchering loci, probably used many times during the general Paleo-Indian occupation. The primary butchering and kill sites were likely located closer to the major water source. The number of resharpened projectile points also support this interpretation of the site.

A large number of steep-angle endscraper and sidescraper edges, spokeshaves, graters, and gouges are also an indicator of tool production. This would be in the form of rearmament and rejuvenation of the basic hunting kit. Supporting this observation are a number of projectile point bases and exhausted points, which appear to be discarded, with the production of new projectile points probably being a primary activity at the site. Unfortunately, no lithic debitage

was collected, which might give further support to this projected activity. A systematic collection of these types of artifacts is needed for a full evaluation of site function.

Based on the limited nature of these observations, the site appears to be a multi-purpose base camp, with possible extensive reuse of the location through time. Twelkemeier shares many similarities with both the Pierce and Nuckolls sites (Broster 1982: 102-103; Lewis and Kneberg 1958: 61-63). However, the number of complete projectile points is much higher at the Nuckolls site. They also tend to be representative of Dalton sub-types. This may be due to a temporal difference, or possibly a factor of heavier collection by local amateurs at the Twelkemeier site. The Pierce site, in West Tennessee, had the same temporal phases of the Paleo-Indian Period represented, but the major occupation was Clovis, and the site covered a much smaller area than Twelkemeier.

An additional ten Paleo-Indian sites have presently been recorded in the immediate area of the Twelkemeier site, and it is evident that these represent only a small percentage of those sites which may produce evidence of Paleo-Indian occupations in this section of the Tennessee River Valley. Many more sites and isolated localities are known to the local collectors. It is to this end that we are conducting systematic investigations of the collections as they are made available. We hope to be able to construct a working model of Paleo-Indian subsistence and settlement based upon this information. Initial observations tend to support generalized adaptation to a diverse environment as proposed for the Middle Tennessee Valley (Hubbert 1989: 160-161). One must be cautious with this generalized procurement model, in that it does not explain the use and manufacture of the very numerous large Clovis projectile points of the Early Paleo-Indian component. The early fluted point makers may yet be determined to have been organized toward very specific large species of game. We believe that the Middle to Late Paleo-Indian lithic assemblage may better fit the concept of a generalized hunting and gathering strategy. The size and variation in projectile point types lend support to a generalized approach to subsistence procurement.

The Twelkemeier site represents a very important data set for understanding the Middle to Late Paleo-Indian habitation of Tennessee. It is through the analysis of these kinds of sites, and hopefully many others like them, that we may be able to determine settlement patterning for this very important period.

It must be emphasized that we are greatly indebted to Mr. Herman Twelkemeier and all of the other individuals who have allowed us to study their collections. The raw data that they are providing are the essential ingredient for the understanding of the Paleo-Indian lifeway in the Kentucky Lake area.

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