LITHIC PROCURMENT PATTERNING AS A PROXY FOR IDENTIFYING LATE PALEOINDIAN GROUP MOBILITY ALONG THE LOWER TENNESSEE RIVER VALLEY

Ryan M. Parish, PhD[1] (corresponding author)

[1]Assistant Archaeology Professor, Earth Sciences, University of Memphis, 125 Johnson Hall, Memphis, TN 38152

rmparish@memphis.edu

ABSTRACT

The Tennessee and Cumberland River Valleys boast some of the highest concentrations of diagnostic Paleoindian artifact finds in the Americas. However, many of these finds are from secondary contexts void of associated deposits. The study utilizes chert provenance data, obtained using reflectance spectroscopy, on a large sample of Late Paleoindian diagnostic bifaces from sites along the Lower Tennessee River Valley. The objective of the study is to visualize group identity and mobility at the close of the Pleistocene. Resulting data suggests that band group mobility may have been significantly less than proposed models for adjacent regions. The data may also indicate that groups were periodically congregating along the Lower Tennessee River from three regions. Chert source data provides a means to glean useful cultural information even from disassociated materials.

KEY WORDS

Chert sourcing, Paleoindian, Greenbrier, Lower Tennessee River Valley, Reflectance spectroscopy

1. INTRODUCTION

The archaeological record rarely permits the analysis of individual social units segregated both spatially and temporally due to mixing of multiple cultural components, taphonomic processes, limitations of radiometric dating techniques, and a slew of other natural and anthropogenic variables. One method in which archaeologists attempt to delineate cultural units in the prehistoric material record is through the categorization of chronologically diagnostic stone tools. These stone tool 'styles' are thought to have been influenced by environmental, technological, and social variables. The knowledge of how to manufacture stone tools was certainly not biological rather, lithic technology was a learned skill and therefore inherently embodies cultural traditions. The current study seeks to identify distinct Terminal Pleistocene/Early Holocene (TPEH) groups and group mobility within the study area and broader region by utilizing standard biface typologies and chert sourcing. The objective is to present a model by which researchers can define unique hunter-gatherer groups by style and their lithic resource selection decisions.

The transition from the late Pleistocene to early Holocene environments and the cultural response to this climatic shift in the Southeastern United States has left researchers with a unique challenge in interpreting the archaeological record of the region. The Western Valley or the Lower Tennessee River Valley (LTRV) is a unique setting within which to study cultural adaptation to climatic stabilization of the early Holocene as the region lies along a convergence zone between the Coastal Plain and Highland Rim physiographic provinces. However, the LTRV, specifically within Hardin County, TN, has received relatively little attention among professional archaeologists even though it is known by the avocational community to contain extensive cultural deposits.

Prior to the documentation of the Jim Parris collection there existed a gap in the known archaeological record of the Paleoindian to Early Archaic periods in the LTRV within Hardin and the surrounding counties. The middle section of the Tennessee River and Pickwick Reservoir immediately to the south in northern Alabama has undergone extensive archaeological testing and contains significant Paleoindian and Early Archaic documented deposits. Similarly, the section of the valley near the Tennessee/Kentucky border to its confluence with the Ohio River has enjoyed extensive surveys. The Parris collection, particularly the Paleoindian and Early Archaic components, is an invaluable asset for the archaeological community and fills a large gap in our knowledge of prehistoric behavior in the LTRV.

A significant portion of the data pertaining to Paleoindian research in the Southeast comes from surface collected lithic artifacts and deflated multicomponent sites many of which reside in private collections. Furthermore, since the region currently lacks stratified Paleoindian age deposits, with some noted exceptions, a majority of the areas chronology stems from typologies established by researchers working in adjacent regions.

For over twenty years the Parris family surface collected artifacts from various locales in Hardin County and maintained detailed maps and notes of their finds. The Parris collection is primarily comprised of lithic materials encompassing nearly every cultural/temporal period from Paleoindian to Mississippian. The Parris' collecting activities were mainly focused along the floodplains and drainages of the Tennessee River within Hardin County.

1.1 Terminal Pleistocene Hunter-Gatherers of the Southeast

We admittedly know little about Paleoindian lifeways in the Southeast. Much of what we do know comes from a few well documented sites such as Dust Cave, Carson Conn Short, Topper, and Hardaway. Models for Paleoindian behavior were once reliant upon those derived from west of the Mississippi River and the Northeast. The comparative datasets from these regions were referenced to describe Paleoindian groups of the Southeast as highly mobile hunter-gatherers either tethered to high quality lithic sources or practicing embedded procurement strategies (Daniel 2001; Gardner 1983, 1989; Goodyear 1989; Goodyear et al. 1990). The visual assignment of chert artifacts to material type localities was used as a proxy to hypothesize large territory ranges often extending over hundreds of kilometers, a view greatly influenced by similar models constructed in adjacent regions. Recently this view has been refined (Anderson et al. 2015; Anderson 1996) to include a regional scale ‘place-oriented’ model of exploitation of resource rich river valleys.

The river valleys are currently thought to have been resource rich ‘staging areas’ during earlier phases of colonization in the region. Later Paleoindian hunter-gatherer groups are viewed as utilizing smaller territory ranges centered on these river valleys and adjacent uplands. This model has been constructed in part from the distribution of diagnostic artifacts and chert type identifications. Dense concentrations of diagnostic Paleoindian artifacts along both the Cumberland and Middle Tennessee River Valleys may demonstrate that these areas were preferentially exploited during the terminal Pleistocene. Environmental reconstructions show that riverine environments in the Southeast would have provided favorable conditions for human occupation possibly earlier than other areas (Delcourt and Delcourt 1985; Hollenbach 2009). A paucity of Paleoindian sites along the LTRV, where the river turns northward from the Pickwick Reservoir, previously gave researchers an inaccurate view of Paleoindian settlement. The gap in site distribution may once have been interpreted as demarcating separate population groups centered on the Cumberland River and along the Middle Tennessee River of Northern Alabama. However, the Paleoindian portion of the Parris collection fills this data gap and represents a significant contribution to our understanding of human settlement/subsistence during the TPEH.

1.2 Environmental setting

The lower section of the Tennessee River diverts northward from its easterly route in Lauderdale and Colbert counties, Alabama. Here the river crosses the Fall line dropping in elevation at Muscle Shoals prior to the Mississippi, Alabama and Tennessee border. Flowing northward beyond the Pickwick Reservoir, the Tennessee River skirts the western edge of the Highland Rim physiographic province prior to empting into the Ohio River near Paducah, Kentucky. The LTRV flows between the Coastal Plain physiographic province of Western Tennessee and the Highland Rim of Middle Tennessee draining portions of over 12 counties. A mixed deciduous hardwood forest consisting of hickory, oak and beech trees flourish in the well-drained saprolitic soils and cherty coarse gravels.

Cryptocrystalline stone sources utilized prehistorically are found in abundance within the Highland Rim. Major chert bearing carbonate formations include the Devonian aged Camden formation, Silurian aged Brassfield formation, the Mississippian aged Fort Payne, Warsaw, St Louis, and Ste. Genevieve limestone formations. Additional sources of tool stone materials include chert gravel and cobble deposits within the Cretaceous aged Tuscaloosa and Upland Complex (formally Lafayette) gravel formations. A wide variation of color, texture, and size exists in these gravels including honey colored Fort Payne and white Camden chert. Tertiary deposits of Fort Payne (Horse Creek/Pickwick) also may take on crimson red, yellow, and black to grey staining within the iron oxide laden Cretaceous sands.

2. METHODOLOGY

2.1 Archaeological sampling

A total of 519 Paleoindian and early Holocene diagnostic projectile point/knives from 35 sites were analyzed. Only those sites (n=8) containing eight or more diagnostic bifaces are included in the current study so that potential patterning in chert source might be discerned within an adequate site sample. Heavily reworked bifaces from these eight sites numbering 101 were not included in the analysis and await additional quantitative type identification methods. Therefore, data from 349 near complete diagnostic bifaces collected from sites; 40Hr370, 40Hr15, 40Hr381, 40Hr456, 40Hr458, 40Hr383, 40Hr395, and 40Py308 are presented below (Table 1). The original site provenience system used by Jim Parris is retained and listed respectively as D-8, H-69, H-16s, H-100, H-101, H-69, H-28, and P-2 for future researchers working with the collection. These site assemblages are multi-component localities; however,

Table 1. All bifaces analyzed in the study are presented by site and by typological classification.

Site	Type	*n*	Chert type	Source region [a]	*n*	Source region [b]	*n*	Source region [c]	*n*
40Hr370									
D-8	Clovis	1	Fort Payne	W. Highland Rim, TN	1	-	-	-	-
	Cumberland	1	Fort Payne	W. Highland Rim, TN	1	-	-	-	-
	Beaver Lake	17	Fort Payne	W. Highland Rim, TN	12	N. Alabama	5	-	-
	Quad	18	Fort Payne	W. Highland Rim, TN	17	N. Alabama	1	-	-
	Greenbrier	88	Fort Payne	W. Highland Rim, TN	46	N. Alabama	21	S. Illinois	21
	Dalton	22	Fort Payne	W. Highland Rim, TN	13	N. Alabama	4	S. Illinois	5
	Stilwell	6	Fort Payne	W. Highland Rim, TN	3	-	-	S. Illinois	3
Site total		153			93		31		29
40Hr15									
H-69	Clovis	1	Fort Payne	W. Highland Rim, TN	1	-	-	-	-
	Beaver Lake	4	Fort Payne	W. Highland Rim, TN	3	-	-	S. Illinois	1
	Greenbrier	42	Fort Payne	W. Highland Rim, TN	26	N. Alabama	8	S. Illinois	8
	Dalton	7	Fort Payne	W. Highland Rim, TN	4	N. Alabama	3	-	-
	Stilwell	2	Fort Payne	W. Highland Rim, TN	1	-	-	S. Illinois	1
	Pine Tree	6	Fort Payne (1 Ste. Gen.)	W. Highland Rim, TN	4	-	-	S. Illinois	1
Site total		62			39		11		11
40Hr381									
H-16s	Beaver Lake	4	Fort Payne	-	-	-	-	S. Illinois	4
	Quad	1	Fort Payne	-	-	-	-	S. Illinois	1
	Greenbrier	34	Fort Payne	W. Highland Rim, TN	2	-	-	S. Illinois	32
	Dalton	10	Fort Payne	-	-	-	-	S. Illinois	10
	LeCroy	1	Fort Payne	-	-	-	-	S. Illinois	1
Site total		50			2		0		48
40Hr456									
H-100	Beaver Lake	2	Fort Payne	W. Highland Rim, TN	2	-	-	-	-
	Quad	1	Fort Payne	-	-	-	-	S. Illinois	1
	Greenbrier	16	Fort Payne	W. Highland Rim, TN	8	N. Alabama	2	S. Illinois	6
	Dalton	7	Fort Payne	W. Highland Rim, TN	1	N. Alabama	3	S. Illinois	3
	Stilwell	3	Fort Payne	W. Highland Rim, TN	2	-	-	S. Illinois	1
Site total		29			13		5		11
40Hr458									
H-101	Beaver Lake	1	Fort Payne	W. Highland Rim, TN	1	-	-	-	-
	Greenbrier	15	Fort Payne	W. Highland Rim, TN	12	N. Alabama	2	S. Illinois	1
	Dalton	12	Fort Payne	W. Highland Rim, TN	9	N. Alabama	2	S. Illinois	1
	Pine Tree	2	Fort Payne	W. Highland Rim, TN	1	N. Alabama	1	-	-
Site total		30			23		5		2
40Hr383									
H-69	Quad	1	Fort Payne	-	-	-	-	S. Illinois	1
	Pine Tree	6	Fort Payne	W. Highland Rim, TN	2	N. Alabama	2	S. Illinois	2
Site total		7			2		2		3
40Hr395									
H-28	Clovis	2	Fort Payne	W. Highland Rim, TN	1	N. Alabama	1	-	-
	Greenbrier	5	Fort Payne	W. Highland Rim, TN	4	N. Alabama	1	-	-
	Pine Tree	3	Fort Payne	W. Highland Rim, TN	1	-	-	S. Illinois	2
Site total		10			6		2		2
40Py308									
P-2	Greenbrier	7	Fort Payne	W. Highland Rim, TN	1	N. Alabama	1	S. Illinois	5
	Dalton	1	Fort Payne	-	-	-	-	S. Illinois	1
Site total		8			1		1		6
Total		**349**			**179**		**57**		**112**

the Paleoindian component is a significant portion at each. Late Paleoindian projectile points were analyzed including Quad, Beaver Lake, Greenbrier and Dalton variants. Also analyzed were a small sample of Middle Paleoindian and Early Archaic types.

2.2 Chert sampling

Geologic chert samples consist of 30 specimens from each of 76 deposits/outcrops for a total of 2,280 samples. Major material types/variants represented in the chert sample database include Ste. Genevieve/Monteagle (Wyandotte), Upper St. Louis (Cobden, Kentucky Blue), Lower St. Louis (Dover), Fort Payne (Buffalo River [Black/Tan], Bullseye), Tuscaloosa gravel (Horse Creek/Pickwick), Bangor, and Burlington. These major chert types were collected from Missouri, Illinois, Kentucky, Tennessee, Mississippi, Alabama and Georgia. Material types not currently included in the study that may potentially affect source results are Upland Complex gravels, Camden and Brassfield chert.

Recorded prehistoric quarry sites were targeted for sampling first followed by primary procurement sites, both ancient and modern in situ outcrops and alluvial deposits. Samples were obtained across both the vertical and horizontal extent of the deposit utilizing a judgmental random selection method. Geologic formation provenience was recorded by referencing United States Geologic Survey (USGS) geologic quadrangle maps for in situ outcrops, residual and alluvial deposits. The majority of chert samples consist of materials coming from Mississippian aged carbonate formations outcropping along the Highland Rim physiographic province as well as the Interior Low Plateau and Valley and Ridge (Figure 1).

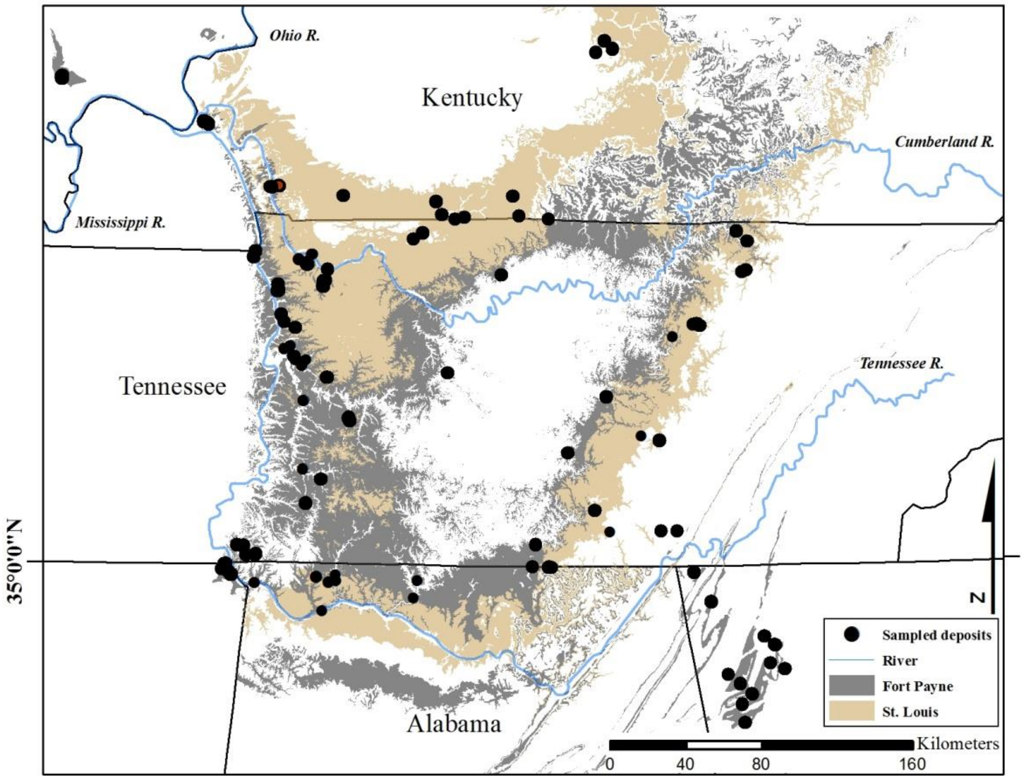

Figure 1. Location of all chert deposits sampled and analyzed in the study.

2.3 Projectile Point Typology

Projectile points included in the study displayed light to moderate reworking and indicated distinct macroscopically identifiable diagnostic attributes. Typological assignments were based primarily on Justice's 1987 and Cambron and Hulse's 1975 point type classifications. Heavily reworked points diagnostic of the Late Paleoindian/Early Archaic transition were not included as specific typologies could not be confidently assigned.

2.4 Chert Sourcing (VNIR and FTIR reflectance spectroscopy)

Reflectance spectroscopy techniques non-destructively record the interactions of matter and electromagnetic radiation at both the atomic and molecular scales. Reflectance spectroscopy is not a quantitative geochemical technique where macro, trace and rare earth elements are identified and counted. The data produced is in the form of reflectance intensity data. Peaks or spectral features are indicative of sample specific atomic and molecular configuration that absorbs a portion of the incident electromagnetic radiation at a unique wavelength. Each absorption peak is indicative of atomic and molecular composition. In chert the absorption peaks relate to micro-mineral groups or impurities within the quartz matrix. However, the dominant spectral features in chert are related to the silica (SiO_2) molecule. Small impurities alter the shape of the silica features producing potentially diagnostic features related to the diagenetic processes affecting a particular deposit within a particular region.

Two complimentary reflectance spectroscopy techniques are utilized in the study. The first, Visible Near-infrared (VNIR) reflectance spectroscopy, records the interaction of matter with the visible and near-infrared portions of the electromagnetic spectrum. Absorption features are primarily related to atomic configuration, specifically outer valence electron fields. Fourier Transform Infrared (FTIR) reflectance spectroscopy records the interaction of matter with the middle infrared portion of the electromagnetic spectrum. Dipole bonded molecules such as SiO_2 are visible as vibrational features. Both the VNIR and FTIR datasets can be mended together creating a composite spectrum of a chert sample consisting of 4,018 reflectance values each potentially diagnostic of parent formation and deposit. The chert samples comprising the database are grouped by type (i.e. geologic formation) and by deposit.

Spectral data was collected from an interior surface of each of the chert geologic samples and processed in order to highlight spectral slope changes and eliminate noise. The resulting spectra were compiled into a chert spectral database or spectral library of samples with known geologic provenience. Two accuracy tests were conducted within the chert database to investigate the ability of the spectral data to characterize chert specimens by parent formation and by deposit. The accuracy tests randomly selected a 10% sample and treated these as having unknown provenience. Discriminant function analysis was selected as the multi-variant statistical method utilized to assign unknown samples to known deposits. The accuracy of the combined reflectance spectroscopy techniques was assessed by the ability to correctly assign the 10% ‘unknown’ samples back to their known formations and deposits. The internal accuracy tests consistently returned results of 99% correct assignment for both parent formation and deposit provenience for the randomly chosen 10% ‘test’ sample.

Spectra were collected from the 519 bifaces non-destructively. The results of 349 of these are reported below representing diagnostic types from eight sites. A series of three measurements were taken per artifact and later averaged in order to provide a comprehensive spectral characterization of each specimen. Where recent damage was present exposing the interior surface, a spectral reading was taken for comparison with the surficial measurement. This was performed to assess any spectral variance introduced by outer surface analysis. Artifact spectra were processed in the same manner as the geologic samples again in order to standardize measurements, eliminate noise and highlight spectral features.

3. RESULTS

3.1 Paleoindian Projectile Point Types

All sites exhibit a range of Paleoindian point types spanning the TPEH (Table 1). Diagnostic types analyzed include Clovis, Cumberland, Beaver Lake, Quad, Dalton and Greenbrier. Dalton variants (Dalton/Greenbrier, Dalton/Colbert, Dalton/Nuchols) were identified but are collectively reported together. Early Archaic types analyzed include Stilwell, Pine Tree, and LeCroy. The majority of types analyzed were those diagnostic of the Late Paleoindian with Greenbriers comprising the largest component (Table 1). The small number of

Middle Paleoindian (Clovis, Cumberland) and Early Archaic types preclude definitive diachronic chert source analysis but the results are reported here to encourage future research.

3.2 Chert provenance

The results of the chert provenance data are organized into two analytical groups. The initial analysis sourced the projectile points by chert type or in other words to a geologic formation. This inter-formational provenance data describes the range of chert material types within the eight site assemblages. At both sites a reliance on Fort Payne chert dominates all other material types (Figure 2a, b) (Table 1). A biface not identified as Fort Payne include a Pine Tree which is characterized as Ste. Genevieve. Other than this single point, a strong preference for Fort Payne resources at all eight sites is apparent. The large geologic occurrence and availability of Fort Payne chert spanning six states and 600 linear km makes finer spatial source determinations necessary.

A second statistical analysis was conducted upon all projectile points typed as Fort Payne to determine the source region(s) and identify any patterns. The intra-formation analysis is designed to source the projectile points to specific areas within the formation. The 40 sampled Fort Payne deposits located from the southern tip of Illinois to the northwestern corner of Georgia including deposits in central Kentucky, central Tennessee, the northeastern corner of Mississippi and northern Alabama were used to refine the spatial resolution of the provenance data for only those bifaces typed as Fort Payne chert.

The discriminant function analysis was rerun only including each of the 40 sampled Fort Payne Deposits as potential source deposits. Three Fort Payne source regions were exclusively identified from this intra-formation provenance assay. The Fort Payne source regions include the Western Highland Rim of Tennessee, Northern Alabama, and Southern Illinois (Table 1). The

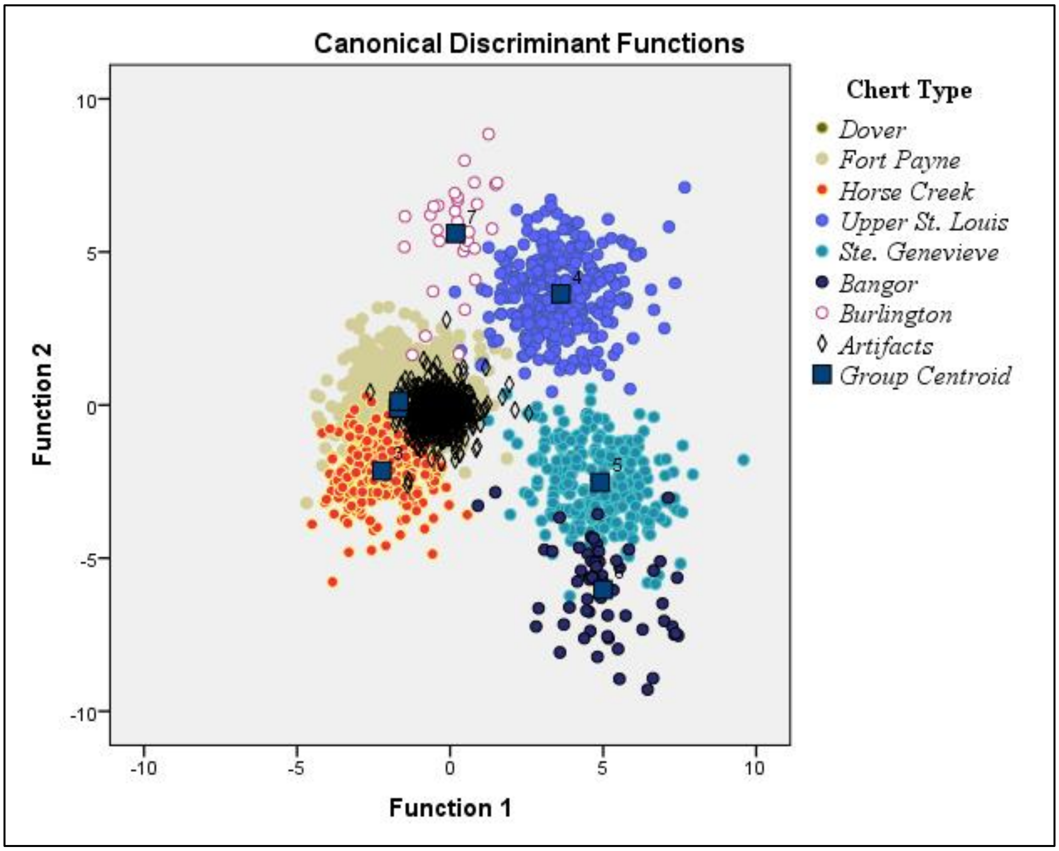

Figure 2a. Discriminant Function scatter plot showing the characterization of diagnostic bifaces to Fort Payne chert samples.

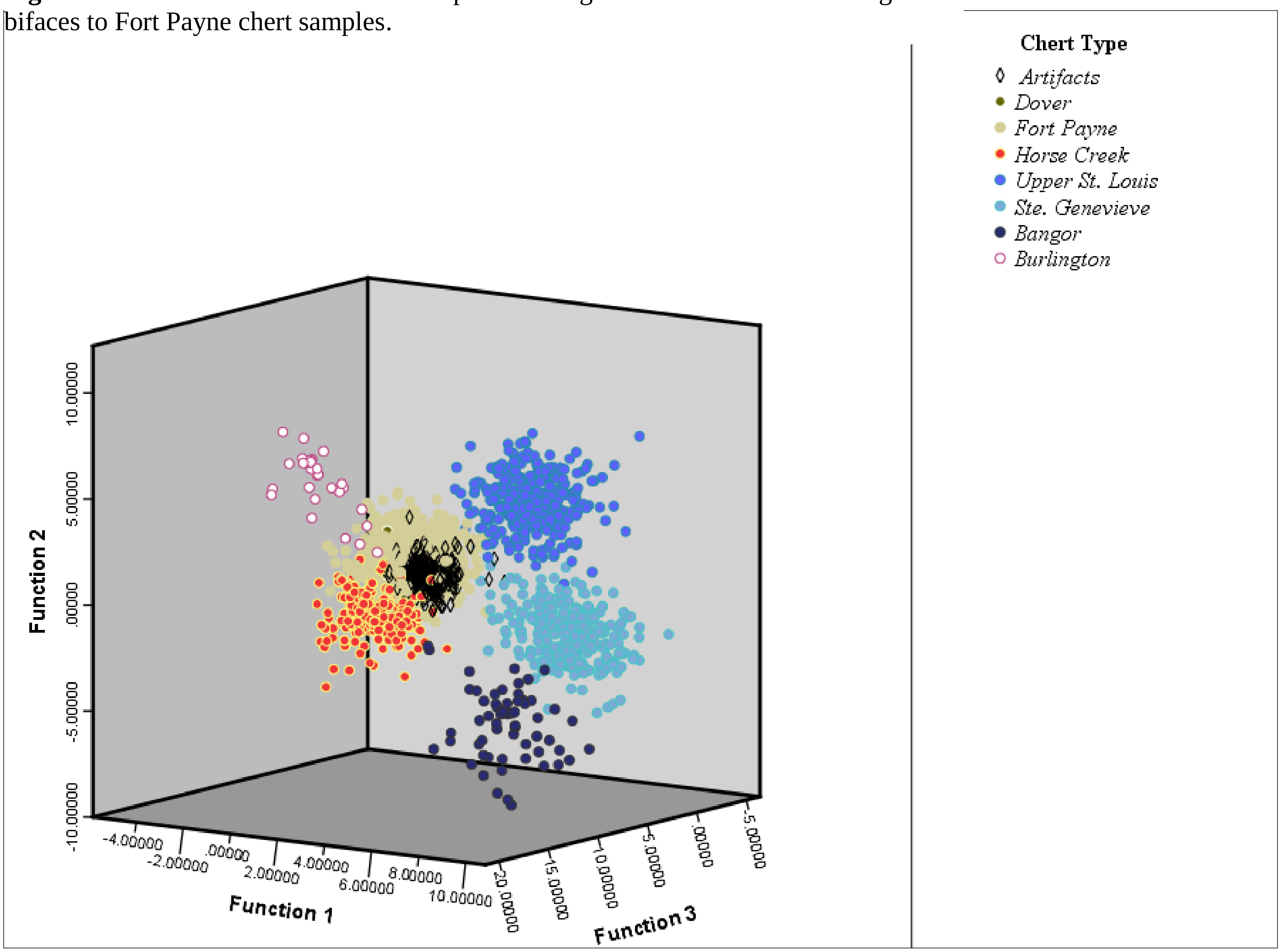

Figure 2b. Three dimensional Discriminant Function scatter plot showing the characterization of diagnostic bifaces to Fort Payne chert samples.

majority of all bifaces (51%, n=179) were manufactured from Fort Payne deposits found along the Western Highland Rim of Tennessee, specifically those deposits located in Houston, Humphreys, Hickman, and minor amounts from Henry and Wayne Counties. Fort Payne deposits from Northern Alabama accounted for a total of 16% (n=57). The third source region is located at a greater distance from the study area from deposits located at the southern tip of Illinois contributing approximately 32% (n=112) of all Fort Payne represented in the diagnostic biface assemblages (Table 1).

The results of the spatially refined provenance analysis broadly demonstrate reliance upon 'local' deposits of Fort Payne chert located in close proximity to the sites. The use of local material by middle Paleoindian inhabitants is potentially demonstrated by the source data upon Clovis and Cumberland bifaces (Table 1). The occurrence of 'non-local' Fort Payne materials from Southern Illinois do not appear in the bifaces until those diagnostic of terminal Late Paleoindian/Early Archaic times. The exception to this trend is at site 40Hr381 where Fort Payne material from Southern Illinois comprises the majority of stone tool material.

4. DISCUSSION

The provenance results presented here need to be contextualized from a methodological, technological, theoretical and cultural perspective. Careful consideration of the results within these four perspectives aids in model construction, testing and directs future research. The continuing application of reflectance spectroscopy instrumentation to chert provenance research studies demonstrates the rich cultural data it can provide. The benefits of reflectance spectroscopy include its relatively low cost, speed, accuracy and non-destructive potential. However, any chert sourcing technique is arguably only as good as the comparison database within which unknown artifacts are being characterized. The chert type database used in the current study consists of 2,280 samples obtained from 76 chert deposits and collectively represents seven material types. Samples of Tuscaloosa gravel deposits were taken from seven deposits (n=210) from northeastern Mississippi northward into Hardin Co., Tennessee. However, no gravel bars were sampled immediately along the Tennessee River. Though sampling of modern exposures of alluvial chert deposits may not provide direct correlates to prehistoric availability, it provides an idea of potential availability. A greater understanding of Tennessee River geomorphology may also identify chert gravel contributions from northern Alabama. Furthermore, an understanding of the dissolution of the Pascola Arch, an eastern extension of the Ozark dome, can contextualize the bedrock source regions of the Tuscaloosa Gravels. Finally, the additional sampling of local chert types including Brassfield, Camden and Upland Complex gravel sources may influence future results.

Viewing the results from a technological perspective includes recognition of the potential perils of outer ‘patina’ surface analysis on archaeological materials. Geochemical studies demonstrate that chemical alterations are present upon the patina surface of some chert types (Gauthier et al. 2012). Preliminary experimentation by the investigator shows that patina may in part be due to the increased angular micro-surface topography occurring on chert that has undergone mechanical and chemical weathering of mineral grains (Parish 2013). The elimination of noise dominated regions in the visible portion of the electromagnetic spectrum appears to alleviate patina variations in the spectral data. Dual measurements obtained upon the outer and inner surfaces of artifacts exhibiting modern edge damage illustrate the minor differences that patina formation has on spectral measurements (Figure 3). However, additional studies are being conducted to explore these effects. Continuing research and development of

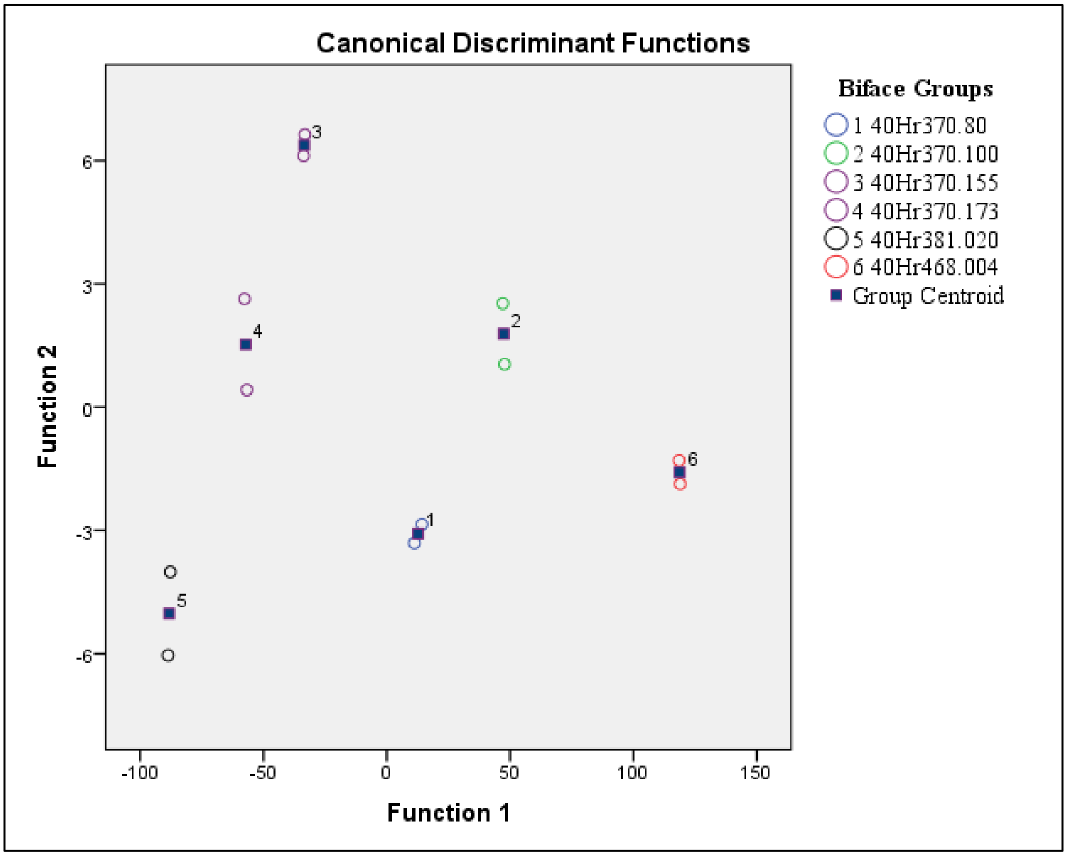

Figure 3. Discriminant function analysis depicting the spectral variance of interior (unweathered) vs. exterior (patina) surface measurements taken upon diagnostic bifaces with patina and modern damage exposing inner surfaces.

outer surface patina effects is crucial if reflectance spectroscopy is to be used as a non-destructive chert provenance technique.

The provenance data should be grounded in anthropological theory if human behavioral data is to be gleaned from the study. It is hypothesized that TPEH groups in the Tennessee and Cumberland River Valleys were settling into resource rich pockets, exploiting local resources, and decreasing range mobility. The large 40Hr370 site, possibly located on a terrace of the Tennessee River, could represent a seasonal or periodically occupied residential base camp from which logistical forays into the Coastal Plain and Highland Rim could have been organized (Binford 1980). However, Gardner's (1983, 1989) tethered to high quality tool stone model does not seem to explain the relatively large quantities of Paleoinidian diagnostic bifaces found at sites from this section of the LTRV. Currently, no known sources of high quality lithic material exist in the immediate (50 km radius) area though continued evaluation of alluvial sources may change this observation. The Yellow Creek drainage basin south of the region in Mississippi may be an exception (Johnson 1981).

A greater knowledge of the chert gravel deposits within the LTRV will almost certainly clarify our understanding of locally available tool stone resources. As noted by other researchers (Anderson et al. 2010), groups during the TPEH appear to rely more upon local chert deposits. If local exploitation of Tuscaloosa/Fort Payne gravels did occur in the region than analysis of the debitage and discarded bifaces would give us clues regarding initial reduction of river cobbles. Jim Parris on multiple times denied the appearance of large amounts of primary reduction material at these sites. A cursory examination of his collection including the unprovenienced portion reveals the paucity of early stage bifaces and cores, whether this is a function of collector bias is currently unclear. If in fact Gardner's "place-oriented" model is an adequate explanation of site location, as adopted by other researchers in the Southeast (Anderson 1996; Daniel 2001), than TPEH inhabitants may have been there for resources other than chert acquisition.

Traditionally, two main models are proposed to explain the presence of exotic chert materials in archaeological assemblages, migration and trade. Highly (residential) mobile foragers is the commonly accepted view for both early and middle Paleoindian groups in adjacent regions. As mentioned previously, this view is challenged in the Southeast due to the spatial distribution of diagnostic bifaces and the prevalence of ubiquitous high quality chert resources. Movements of Late Paleoindian (Greenbrier and Dalton) groups and/or macro-bands are one possible explanation for the presence of Fort Payne chert from Northern Alabama and Southern Illinois. A seasonal or periodic territory range encompassing over 30,000 square kilometers narrowly defined from the confluence of the Ohio and Mississippi Rivers to the Middle Tennessee River Valley in Northern Alabama, pushes the boundaries for historically documented hunter gatherer societies (Binford 1983; Kelly 2007; Steward 1938). Even with the use of watercraft, the question remains what would draw LPEH groups northward, certainly not the relatively small deposits of Fort Payne (Elco) chert.

Trade and trade networks are another explanation for the presence of exotic Fort Payne at the TPEH sites along the LTRV. The presence of trade networks is difficult to visualize and often requires additional datasets. However, the inhabitants of the LTRV had access to high quality deposits of chert along the Highland Rim of both Tennessee and Alabama albeit possibly not in the immediate vicinity. Trade may not adequately explain the chert provenance patterning revealed as relatively large amounts of Fort Payne from Illinois are identified at each site. In fact at 40Hr381, Southern Illinois Fort Payne comprises nearly all of the diagnostic biface assemblage. If trade were occurring one might expect smaller numbers of these 'exotics'.

Periodic subsistence rounds over large areas and trade may not account for the data revealed in this study but the congregation of distant groups in order to exchange information is worth consideration. The series of TPEH sites along this portion of the LTRV may represent occasional congregation areas for three macro-bands centered locally along the Western Highland Rim, Northern Alabama and the confluence of the Ohio and Mississippi Rivers (Figure 4). Periodic aggregations of distant hunter gatherer groups, termed fandangos by Steward through his observations of Reese River Valley Shoshone, would have been important to peoples adjusting to shifting resources. Exchange of information, mates, and materials is documented ethnographically though in differing environmental settings (Binford 1983; Steward 1938;

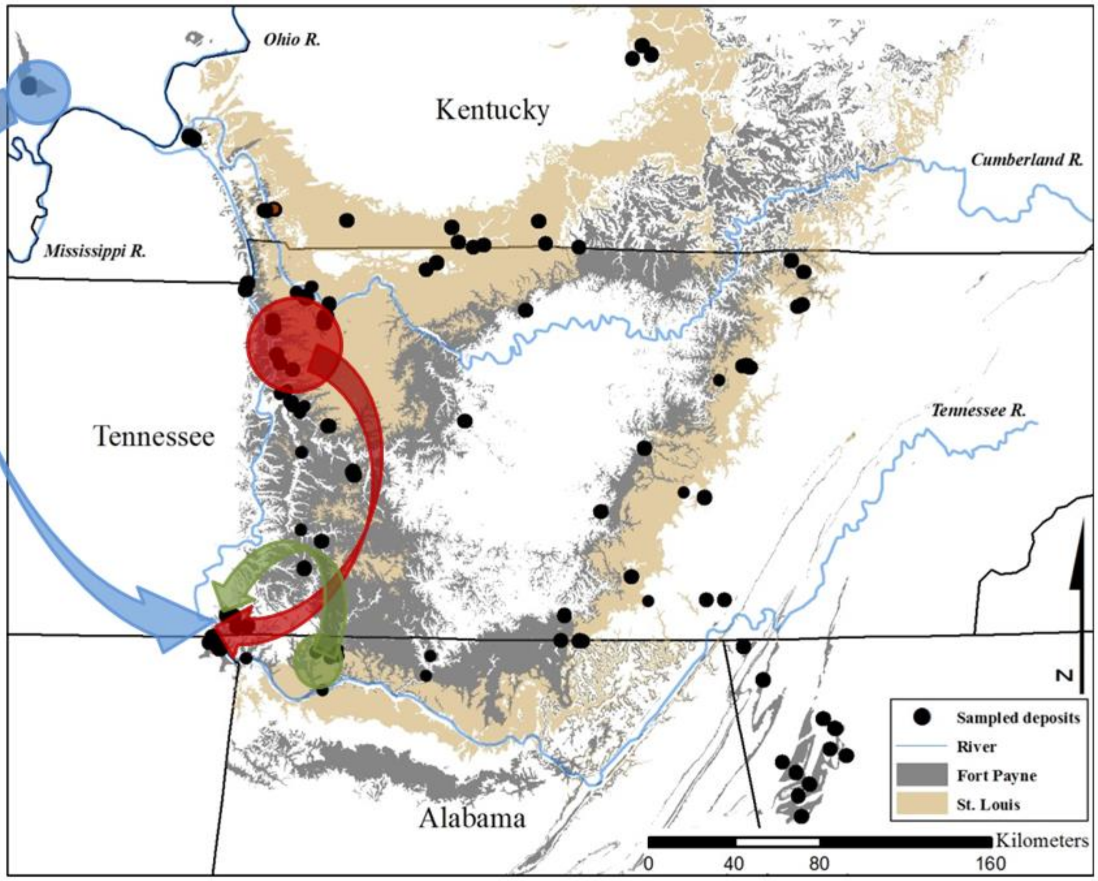

Figure 4. Three main Fort Payne source regions identified in the study possibly signifying periodic aggregations of three Late Paleoindian/Early Archaic macro-bands.

Thomas 1973). Though a tenuous explanation, fandangos between macro-bands along this section of the LTRV may also account for the overabundance of Southern Illinois Fort Payne chert at sites 40Hr381 and 40Py308. These sites being repeated primary camp locations for those northern bands. Only continued analysis from methodological, technological, theoretical and cultural perspectives can clarify the results presented here.

CONCLUSIONS

The provenance results of 349 Terminal Pleistocene/Early Holocene diagnostic bifaces from eight sites along the Lower Tennessee River Valley illustrate the almost exclusive use of Fort Payne chert resources. Deposits located along the Western Highland Rim collectively represent the majority of material as one would expect for Late Paleoindian regional foragers but a significant portion of the diagnostic bifaces are sourced to deposits in northern Alabama and southern Illinois. Explanations for this include methodological/technological issues related to sampling and/or analysis upon outer artifact patina surfaces, large territorial ranges, trade networks and periodic aggregations. Currently given the large chert type database and preliminary studies regarding the effects of outer artifact surface analysis, methodological and technological concerns are currently deferred. Both the size of the proposed band-group territory range and number of exotic Fort Payne materials encountered per site is taken as evidence refuting direct procurement and regional trade. Therefore, it is proposed that evidence for periodic aggregation events along the LTRV during the TPEH period exists.

Apart from the interpretations regarding site function and distributions of chert materials, it is apparent that this relatively small portion of the well provenienced Jim Parris collection significantly impacts our understanding of prehistoric life along the southern reaches of the Lower Tennessee River Valley. Subsequent studies that incorporate data from sampled alluvial deposits, though difficult to assign geologic provenience, will increase our understanding of tool stone availability and selection (Amick 1985, 1987). Analytical chert source data coupled with lithic analysis and Tennessee River Valley morphology will also give us a more complete view of Late Paleoindian group identity and group mobility during the Terminal Pleistocene.

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