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A Study of Diagnostic and Nondiagnostic Artifacts from the Lower Little Hocking River Valley in Southeast Ohio

By

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The Little Hocking River is a little-known short tributary of the Ohio River located in the southwest portion of Washington County in southeastern Ohio (Figure 1). Whereas considerable archaeological research has been conducted along the Ohio River (Collins 1979; Lepper 1994; Smith 1986), in the neighboring valleys of the Muskingum River (Carskadden and Morton 2018; Morton and Carskadden 1975) and the Hocking River (Abrams and Freter 2005a; Murphy 1989) in Ohio, and in the Kanawha River valley in West Virginia (Brashler et al. 1994; Broyles 1966, 1971), archaeological investigations in the Little Hocking River valley have been very limited. Because so little is known about the prehistoric record in the Little Hocking River valley, a sizeable collection of nondiagnostic and diagnostic artifacts obtained primarily from the lower portion of the valley was analyzed and is reported here. This collection was amassed by R. Glenn Ray over a period of nearly two decades.

Previous Investigations

A records check with the Ohio State Historic Preservation Office, Ohio History Connection revealed that only three small cultural resource management (CRM) surveys (Hillen et al. 1995; Seagrave 2015; Weller and Ledezma 2014) have been conducted within the boundaries of the Little Hocking drainage basin. Although only limited work has been conducted in this watershed, several CRM projects have been conducted along the Ohio River floodplain between Belpre and Pottersfield, and many more have been conducted in the Hocking and Muskingum river valleys according to the records of the Ohio State Historic Preservation Office.

Five archaeological sites have been recorded in the Little Hocking drainage basin, two of which are historic house sites. Only two confirmed prehistoric sites have been recorded within the valley. One is a small open-air site that was recorded by Hillen et al. (1995:18–21). This site (33WN344) was reported as a lithic scatter (two flakes of Upper Mercer chert) found in a plowed strip on a floodplain near the confluence of Tupper Creek and the East Branch of the Little Hocking River. The authors independently visited this locale in 1994 and found a light lithic scatter in the same field. We also found a biface fragment and a light scatter of chert flakes on the summit of an adjacent isolated hill that we recorded as 33WN528. The fifth site is a small mound of indeterminate origin. It was recorded on a preliminary site form in 2008 as 33WN438 pending an in-field examination; however, its origin remains indeterminate. Given its location in a small 3rd Order intermittent tributary (Cold Spring Hollow) of the Little West Branch (Figure 1), it appears likely that it is a natural erosional remnant or perhaps an old farm push pile (a

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farmstead is located nearby). Several Woodland earthen mounds have been recorded along the nearby Hocking River (Murphy 1989:122–229), but the height and diameter of those artificial mounds appear to be greater than that at 33WN438.

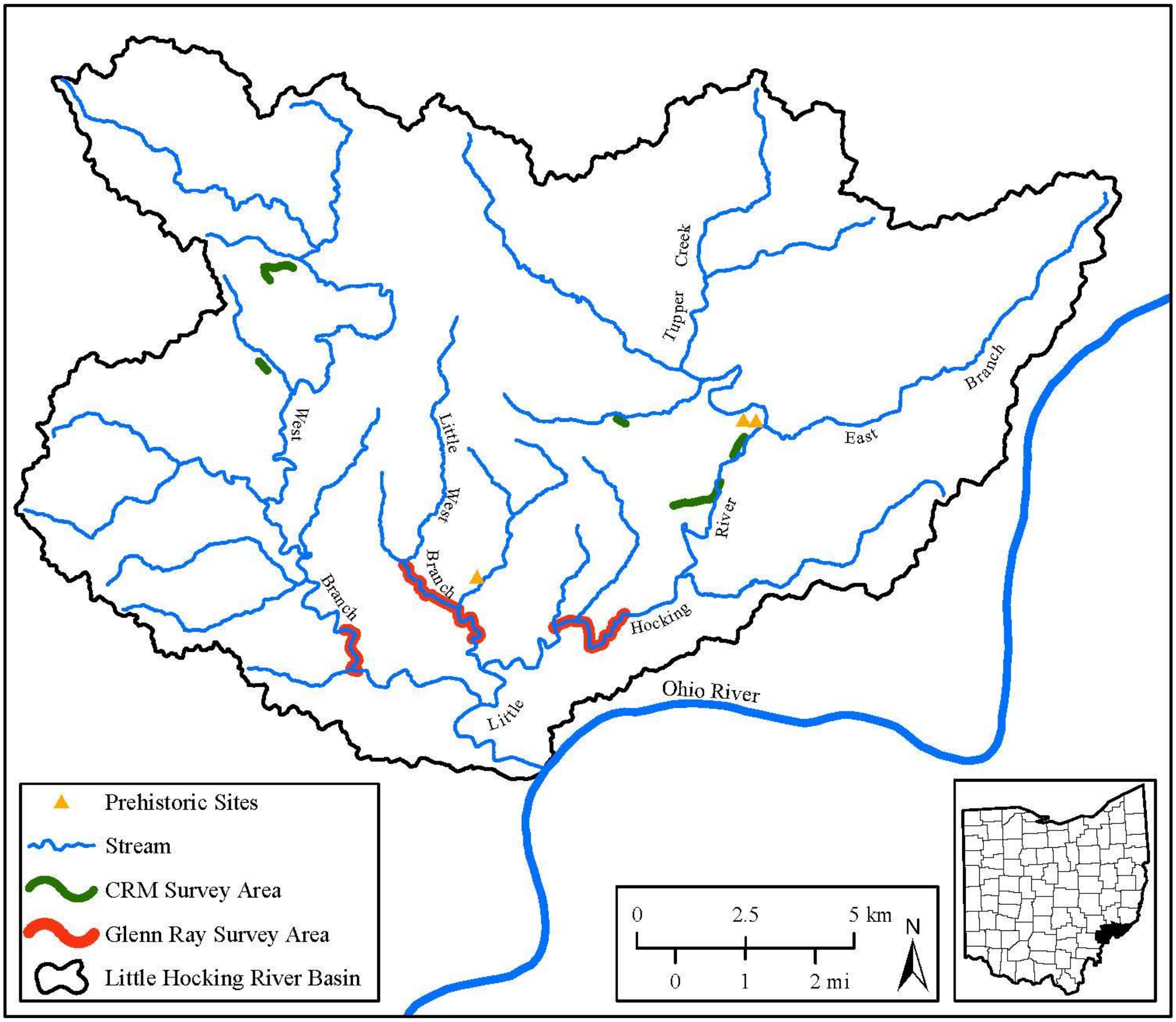

Figure 1. Little Hocking River drainage basin depicting areas monitored, previously recorded sites, and CRM survey areas.

Study Area

The Little Hocking drainage basin lies between two much larger tributaries. The mouth of the Muskingum River lies approximately 32 river km upstream the Ohio River at Marietta, whereas the mouth of the Hocking River is located 13 river km downstream at Hockingport. From the east, the Little Kanawha River empties into the Ohio River 14 river km upstream at Parkersburg, West Virginia. The Kanawha River, which drains a large portion of southern West Virginia, joins the Ohio River approximately 145 river km downstream. Washington County is located on the western flank of the Appalachian Plateau physiographic province and in the southern portion of the Unglaciated Plateau subprovince of Ohio (Purtill 2009:567). The Ohio River and its broad floodplain form the southern border of the county. The rest of the county is comprised of narrow, deeply entrenched stream valleys, steep ridge slopes, and narrow sinuous ridge summits. The Unglaciated Plateau area supported an environment rich in plant and animal resources throughout the Holocene (Abrams and Freter 2005b:16–19). Although natural resources were plentiful in the Little Hocking River valley, they were fewer than in the adjacent Muskingum and Hocking river valleys.

The Little Hocking River basin, which is about 25 km wide, is comprised of two large forks of comparable size, each with a reach of approximately 17 km from north to south (Figure 1). The West Branch drains the western portion of the basin, whereas the east branch (called the Little Hocking River) drains the eastern portion. A smaller stream called the Little West Branch, which is located between the two forks, extends only 9 km from north to south. The Little Hocking River joins the Ohio River at the small community of Little Hocking.

Bedrock units that crop out within the Little Hocking River basin consist of cyclical sandstone, mudstone, shale, siltstone, limestone, and coal deposits of the upper Pennsylvanian-age Monongahela Group and the lower Permian-age Dunkard Group (Collins and Smith 1977:14–40; Slucher 2004). Units in the Monongahela Group comprise valley floors and the lower portions of ridges, whereas units in the overlying Dunkard Group comprise the upper slopes and summits of ridges. Numerous rockshelters formed in the Little Hocking River valley at the contact between the massive Hockingport sandstone and a softer underlying unit such as shale, coal, or thinly bedded siltstone (Collins and Smith 1977:28).

Gravel bars throughout the study area range between 20 and 70 m long. They are comprised predominantly of redeposited tabular clasts of siltstone (typically 2–10 cm in diameter) supplemented with sandstone and small quantities of shale. In addition to these rocks, several other types of local and nonlocal rocks were found on gravel bars of the West and Little West branches. Local rocks include chert, fossil wood, hematite, quartz pebbles, one cobble of conglomerate with quartz pebbles, one pebble of argillaceous limestone, and one chunk of coal. The small redeposited cobbles and pebbles of chert are described below under “Chert Availability and Use.” Eight pieces of fossil wood measure between 2 and 6 cm long. Only one pebble was sufficiently replaced with silica and produced a crude conchoidal fracture. Nine small pieces of hard subangular hematite measure between 21.3 and 38.4 mm in long dimension; however, none of them appear to have been intentionally ground or otherwise modified. Murphy (1989:31, 40) noted the presence of fossil wood and chunks of hematite (up to 30 cm in diameter) in areas to the east of Athens. Sub-rounded to rounded white quartz pebbles (15.4–64.7 mm in diameter) derived from a conglomerate at the base of the Hockingport sandstone (Collins and Smith 1977:28). Nonlocal rocks include six sub-rounded to rounded granite pebbles (23.4–54.4 mm). The granite pebbles appear to represent glacial till redeposited adjacent to the ancestral Ohio River valley by glacial outwash.

Methods

In 1991 Glenn Ray purchased a house and property on a ridge overlooking the Little Hocking River, 5.5 km upstream of its confluence with the Ohio River. As an avid canoer, he soon began to explore the lower stretches of the Little Hocking River and two of its largest tributaries. Situated close to the Ohio River, the Little Hocking is usually backed up several kilometers by the lock and dam system on the Ohio, providing easy canoe access upstream and downstream of his property.

During the first 10 years of canoeing, Glenn collected trash along the streams. He also occasionally picked up small glass fragments from the surface of gravel bars. In 2002 while collecting glass from a small gravel bar, he found a fragment of a projectile point/knife (PPK). During the following 18 years, he frequently surveyed the surfaces of gravel bars for redeposited prehistoric artifacts, ultimately assembling a collection of nearly 500 specimens. He stopped canoeing and looking for artifacts in 2020.

Glenn Ray obtained some training in archaeological work, having participated in a large survey project that Jack Ray supervised in the Ozarks region of southern Missouri for several months in 1982 and 1983 (Ray et al. 1985). As a result, Glenn systematically surveyed gravel bars along linear transects spaced about 2–3 m apart. He also compiled several journals in which he recorded various observations, including the locations and outline drawings of most of his diagnostic artifacts. His success in amassing such a large artifact collection was due in part to lack of competition. During a 25-year period in which he canoed at least once every month, he never saw anyone else looking for artifacts on gravel bars.

Glenn most frequently surveyed gravel bars along the lower portion of the Little West Branch. This stream is closest to his property (0.7 km downstream) and contains more gravel bars. The lower 1 km of the Little West Branch is typically impounded by standing water, whereas the water level above this section is shallower and ebbs and flows with the changing levels of the Ohio River. Glenn plotted 11 gravel bars along a 2.2 km stretch of the Little West Branch between the impounded section and the bridge at School House Road (Figure 1).

The West Branch was surveyed less frequently due to a relative long distance that Glenn needed to paddle his canoe over flat water. The mouth of this stream is located 2.3 km below his property, and the lower 3.9 km of the West Branch (to Grass Run) are usually impounded by backwaters of the Ohio River. Glenn surveyed at least five gravel bars along a 1.3 km stretch upstream of Grass Run (Figure 1). He also canoed upstream the main stem of the Little Hocking River as far as the bridge at State Route 339, but this was the least frequently surveyed area. Gravel bars on the main stem are exposed only above the mouth of Short Brook (Figure 1), located 2.5 km above his property. Gravel bars along these three sections were always monitored after large rainfall events that reworked gravel deposits.

Because the Ray collection consists of surface finds redeposited on gravel bars, precise locations of the sites from which they eroded are unknown. Glenn made no effort to survey cutbanks and adjacent terraces on private properties to locate these sites. Nevertheless, it is clear the artifacts came from open-air sites located upstream of gravel bar find locations. Macroscopic and microscopic examination of the edges of the chert artifacts in the Ray collection indicates that all traveled some distance before being redeposited on gravel bars; however, the amount of edge damage is relatively limited. In most cases, the damage is confined to the thin edges of artifacts and is the equivalent of light-to-moderate grinding found on the haft elements of some Archaic PPKs. Accordingly, it appears likely that most were transported downstream less than

0.5–1.0 km from their points of origin. Only one PPK, which exhibits significant rounding of blade edges and arises between flake scars, may have been transported a greater distance.

Reconnaissance surveys examining cutbanks, rockshelters, and gravel bars were conducted along areas Glenn visited in the Little West Branch, West Branch, and main stem on October 20–22, 2022 when impounded water level from the Ohio River was at an average low (4.9 m). Several landforms that might contain artifacts were identified along the Little West Branch. The oldest is a small erosional remnant (isolated hill) located on the right bank between two intermittent streams approximately 600 m downstream of School House Road Bridge. Two sides of the elongated hill have been eroded by stream action. The oldest alluvial landform appears to be an early-middle Holocene T-1 terrace approximately 3.3 m high, located 800 km downstream of the mouth of Cold Spring Hollow. This landform is comprised primarily of brown (7.5YR 4/4) silty clay loam sediments, which are exposed in a 40-m long eroded cutbank (Figure 2). Based on the recovery of several Early Archaic points on gravel bars upstream of Cold Spring Hollow, one or more T-1 terraces also probably occur above the area surveyed by Glenn. Multiple younger alluvial landforms are present along the Little West Branch. These slightly lower landforms (2.1–2.8 m high) appear to be high (F-2) floodplains that may be middle-late Holocene in age. Two of these floodplains have eroded cutbank faces that exposed brown (10YR 4/3) silt loam sediments.

Several similar F-2 floodplains are located along the West Branch above and below Grass Run, two of which have active cutbanks. Although no T-1 terraces were identified, it appears that one or more exist upstream of Ross Road or above the mouth of Grass Run where one Early Archaic PPK was found. Only one location along the main stem of the Little Hocking River was spot checked. It consists of a T-1 terrace with an eroded cutbank immediately east of the confluence of Short Brook and the Little Hocking River. The above landform observations are preliminary. Intensive archaeological surveys are necessary to positively identify prehistoric sites in the study area, and test excavations would be necessary to determine cultural components and ages of the respective landforms.

Glenn visited four rockshelters in short side valleys of the Little West Branch and 11 rockshelters in small tributary valleys of the West Branch. Three rockshelters in each branch were visually inspected in October. The rockshelters are typically large and U-shaped with intermittent streams draining over the roofs (Figure 3). Although there are exceptions, most of the rockshelters in the study area appear to have been unsuitable for sustained prehistoric occupation. The floors are typically wet or damp with limited level horizontal space (generally less than 1–2 m wide). Most floors slope sharply downward not far from the back walls of the rockshelters (Figure 4). Accumulation of large and small sandstone boulders as well as fine granular deposits has been rapid in all of the rockshelters, potentially burying early cultural deposits. Uncontrolled digging appears to be limited in most of these sheltered sites, probably because relatively few artifacts are exposed on surfaces.

Glenn found very few artifacts (mostly flakes) within or near the rockshelters. Only one unidentifiable PPK fragment was found in a rockshelter on the West Branch, and one unidentifiable PPK fragment was found in a spring branch leading away from a rockshelter on the Little West Branch. No subsurface testing was undertaken at the rockshelters. Thus, little is known about the potential for buried prehistoric deposits; however, based on apparent rapid breakdown in the shelters, light artifact scatters could be deeply buried. Murphy (1989:309–332)

Figure 2. Eroded cutbank of a probable early-middle Holocene T-1 terrace in the Little West Branch survey area (scale [yellow tape] is 2 m).

reported abundant rockshelters throughout the neighboring Hocking River valley, but he noted that few contained many artifacts or stratified midden deposits, partly due to past extensive uncontrolled digging. The few that did contain cultural material yielded Archaic through Late Prehistoric artifacts.

Results: The Ray Collection

Except for one calcified deer rib bone fragment, the Ray collection consists entirely of chipped-stone artifacts and natural gravel clasts of sedimentary and igneous origin. Prehistoric pottery is absent. It is possible that Woodland and Late Prehistoric pottery is present on sites located along the main stem of the Little Hocking River where the valley floor is wider and semipermanent villages may have been established. Relatively few artifacts in the Ray collection came from this area. In contrast, the West and Little West branches (especially the Little West Branch) have very narrow valley floors, and these areas may have been reserved primarily for small, seasonal, or short-term field camps for hunting and gathering purposes during Woodland and Late Prehistoric times. Alternatively, prehistoric pottery may be present in these two stream

Figure 3. Example of a U-shaped sandstone rockshelter located in the West Branch survey area.

valleys as well, but small abraded redeposited pottery fragments were unrecognized among the prevalent flat, brown siltstone clasts that dominate the gravel bars. Future archaeological investigations in the study area should help clarify the presence/absence of pottery.

The chipped-stone assemblage is comprised of more than 475 chert artifacts (Table 1). Glenn picked up nearly every piece of chert that he saw, including unmodified natural pebbles and cobbles. Consequently, there was no bias in his collecting strategy (e.g., collecting only early PPKs or artifacts made from specific types of colorful chert). It is not difficult to discriminate between lustrous chert and nonlustrous siltstone and sandstone gravel. Approximately 99% of the artifacts in the Ray collection came from gravel bars. Only two unidentifiable PPK fragments and a few flakes were found on ground surfaces within or near a couple of rockshelters, and one unidentified PPK was found on an eroded cutbank.

The bulk of the collection and 92% of the diagnostic artifacts were collected from gravel bars along the Little West Branch. All time periods from Late Paleoindian to Late Prehistoric are represented. However, the Early Archaic and Late Archaic periods have the greatest representation with 25 specimens and nine point types and 16 specimens and six point types,

Table 1. Chipped-stone artifacts in the Ray Collection.

Artifact Type	Number
Core and Flake Debitage	243
Side Scraper	3
End Scraper	8
Drill	1
Bifacial Preform	30
Midsection/Distal Fragment	41
Unidentifiable PPK Fragment	51
Unidentified PPK	15
Diagnostic PPK	85
Total	477

Figure 4. Typical narrow level floor space and sharply sloping deposits in Little Hocking River rockshelters (West Branch).

respectively. Six diagnostic PPKs were recovered from gravel bars of the West Branch that include four Early Archaic PPKs, one Middle Archaic PPK, and one Late Prehistoric PPK. Only three unidentified PPKs were recovered from a single gravel bar on the main stem of the Little Hocking River (at the mouth of Short Brook).

Nondiagnostic Chipped-Stone Artifacts

The bulk (82.2%) of the Ray collection consists of artifacts that could not be assigned to a cultural time period or temporal affiliation. These nondiagnostic chipped-stone artifacts have been divided into core and flake debitage, preforms, and other bifacial and unifacial tools such as drills, scrapers, and fragmentary PPKs.

Core and Flake Debitage

Half of the collection is comprised of core and flake debitage (Table 2). Most of this debitage represents direct freehand percussion with some pressure flaking. Only two cores and one tested cobble were found. One core, which is small (<4 cm) and exhausted, was made from a highly abraded and rounded alluvial cobble of unidentified chert. It may have been fractured by bipolar percussion. The other specimen is a large working (aborted) core that was made from an angular cobble that measures 12 cm long, 8.6 cm wide, and 4.2 cm thick. It appears to have been made from Brush Creek chert and was likely transported to the study area from nearby Morgan or Athens counties. The tested cobble is small (<6 cm) and was made from a local chert cobble. All stages of reduction are represented in the flake debitage. Initial reduction of cores is represented by primary (>50% cortex) and secondary (<50% cortex) flakes and tertiary (or interior) flakes, most of which exhibit thick flat platforms. Bifacial reduction and resharpening of biface edges are represented by biface flakes with relatively thin faceted platforms. Flake fragments are broken flakes with missing platforms and, therefore, are nondiagnostic as to reduction sequence, although the bulk are thin and appear to represent broken biface flakes.

Table 2. Core and flake debitage.

Debitage Type	f	%
Core/Tested Cobble	3	1.2
Primary Flake	16	6.6
Secondary Flake	41	16.9
Tertiary Flake	19	7.8
Biface Flake	70	28.8
Flake Fragment	59	24.3
Bipolar Core and Flake	35	14.4
Total	243	100

In addition to direct freehand percussion, chert reduced by bipolar percussion is represented by 35 chunky specimens. Bipolar percussion flaking involves the placement of a pebble on a hard anvil and striking (smashing) it with another cobble or hard hammer, initiating a compression force that splits the pebble into chunky fragments, shatter, and flakes (Crabtree 1972:42; Odell 2003:49). Control over the flaking process is lacking. Half of the specimens are chunky pebble fragments (<6 cm in diameter), some of which exhibit crushing and/or small negative percussion scars on opposite ends. The other half is represented by thinner pieces of shatter and irregular flakes. Bipolar artifacts comprise <15% of all the debitage and probably represent expedient or juvenile testing of pebbles too small to be easily fractured by freehand percussion. However, the use of bipolar technology to produce expedient cutting tools (e.g., flake knives) or wedges cannot be ruled out. Nevertheless, it is unlikely that bipolar percussion was an important reduction method in southeast Ohio.

Preforms

Thirty bifacial preforms were collected. Thirteen are unbroken aborted preforms, whereas 17 are broken preforms that failed during manufacture. Complete preforms are small-to-medium in size, measuring between 29.5 and 66.0 mm in length (Figure 5a-o). Six specimens that are thick with limited, irregular flaking and sinuous edges represent early-stage preforms. The rest are relatively thin with more systematic flaking and are middle- to late-stage preforms. At least eight small triangular specimens with straight bases appear to be arrow point preforms (Figure 5i-o). They range in size from 29.5 to 43.8 mm.

Other Tools

The Ray collection includes only one hafted drill. It is relatively short (39.5 mm) with an expanding stem and straight base (Figure 5p). The distal end was bifacially reworked into a short graver spur, possibly after the original drill bit was broken. Eleven unifacial tools are scrapers with beveled working edges. Two are classified as side scrapers, eight are classified as end scrapers, and one is beveled at the distal end and along one side. Four unbroken end scrapers were fashioned from biface flakes with recurved ventral faces, whereas one was made from a recurved secondary flake. The two smallest end scrapers (Figure 5q-r), which exhibit uniform shapes and careful retouch along both lateral margins, could be associated with either Early Archaic or Late Prehistoric occupations.

Forty-one broken bifacially flaked artifacts with relatively thin and uniform shapes represent midsection and distal fragments of either PPKs or late-stage preforms. Fifty-one additional broken bifaces with distinct notches or stem segments represent unidentifiable PPK fragments.

Diagnostic Artifacts

A total of 85 diagnostic PPKs was recovered from gravel bars of the lower Little Hocking River valley. These artifacts, which indicate a human presence in this small river valley for more than 10,000 radiocarbon years before present (11,475 years calibrated), are presented in Table 3 by chert type. The only time periods that are not represented are Early Paleoindian and Middle Paleoindian. No fluted points such as Clovis, Gainey, or Cumberland were recovered; however, their absence does not exclude the possibility of periodic forays into the Little Hocking River valley. More extensive surveys on remnant Pleistocene terraces in the valley and on ridge summits in the uplands might indicate some limited resource exploitation in this small Ohio River tributary during Early and Middle Paleoindian times.

Prufer and Baby (1963:62–63) noted that fluted points were very rare in the Unglaciated Plateau area of Ohio. Conversely, concentrations of fluted points appear to be along the Ohio River and its largest tributaries (Seeman and Prufer 1982; Seeman et al. 1994:78–79). Only one of the larger documented Paleoindian sites in Ohio is located in the Unglaciated Plateau. This is the Welling workshop site located next to the Upper Mercer chert quarries in Coshocton County (Seeman et al. 1994:79). Murphy (1989:64–68) reported that fluted Paleoindian artifacts were rare in the nearby Hocking River valley and most of the Unglaciated Plateau portion of southeast

Ohio, an observation echoed by Purtill (2009:581). All radiocarbon ages are presented below in radiocarbon years before present (rcybp).

Figure 5. Nondiagnostic preforms and tools: (a) preform (LG); (b) preform (VP); (c-f) preforms (UM); (g-j) preforms (BC); (k-o) preforms (UI), (p) drill (BC); (q) end scraper (ZK); and (r) end scraper (VP).

Late Paleoindian (ca. 10,200–10,000 rcybp)

The oldest diagnostic artifact in the Ray collection is a Hardaway Side Notched point (Coe 1964:67). It represents the first notched point type that appeared at the end of the Paleoindian period (Anderson 1996:12; Driskell 1996:326–328; Justice 1987:43) and may have extended into the earliest part of the Early Archaic (Vickery and Litfin 1994:182–183). As an initial notched form, Hardaway Side Notched is probably contemporaneous with corner-notched San Patrice points in the Midsouth that have been found in the same midden deposits as Dalton points (Lopinot and Ray 2010; Ray et al. 1998). The blade of the Hardaway Side Notched point (22.5 mm long) has been extensively bifacially resharpened nearly to exhaustion (Figure 6a). Both shoulders and one ear are missing. The base is concave, ground, and exhibits multiple basal thinning scars on both faces that are 5.5 mm wide and extend up to 14 mm from the base.

Early Archaic (ca. 10,000–8000 rcybp)

The Early Archaic period is represented by 10 point types, two of which are side notched, four are corner notched, and four are stemmed. The side-notched point types consist of Early Side Notched and Kessel Side Notched. Early Side Notched points, also referred to as Big Sandy I, Taylor, and Bolen (Anderson and Sassaman 1996), typically differ from later Middle Archaic side-notched types as being larger on average and having beveled or serrated blades and concave bases. The largest Early Side Notched specimen is asymmetrical with one large prominent side notch and one corner notch (Figure 6b). The side with the corner notch appears to have been reworked as a salvage attempt after the basal ear below the notch was removed by a fracture scar

Figure 6. Late Paleoindian and Early Archaic PPKs: (a) Hardaway Side Notched (UM); (b-c) Early Side Notched (UM); (d) Early Side Notched (UI); (e) Early Side Notched (ZK); (f) Early Side Notched (NM); (g-i) Kessell (UI); (j) Kessell (UM); and (k) Kessell (NM).

that is still partially evident. Although the reworked base is straight, it appears that it was slightly concave before it was broken. The unbroken portion of the stem is moderately ground. The blade is unbeveled but slightly serrated. A second Early Side Notched specimen was reworked into a drill, which was alternately beveled on the left sides (Figure 6c). The base is slightly concave and moderately ground. The third Early Side Notched point exhibits a concave base and a blade with alternate left bevels (Figure 6d). The fourth specimen has a concave base and a large impact fracture scar on one face (Figure 6e). The final Early Side Notched point exhibits a slightly

Table 3. Diagnostic projectile points/knives by chert type.

Point Type	**Local Gravel (LG)**	**Brush Creek (BC)**	**Upper Mercer (UM)**	**Zaleski (ZK)**	**Vanport (VP)**	**Newman (NM)**	**Unidentified (UI)**	**Total**
Hardaway Side Notched			1					1
Thebes				1				1
St. Charles						2		2
Early Side Notched			2	1		1	1	5
Kessell			1			1	3	5
Kirk Corner Notched		3	5	2			1	11
Kirk Stemmed		1	1					2
MacCorkle						1		1
St. Albans			1	1				2
LeCroy			1				1	2
Kanawha		2		1			1	4
Big Sandy II			3	4		2	1	10
Stanly		1						1
Savannah River			1					1
Ledbetter		1						1
Genesee							1	1
Lamoka	1	1		3			1	6
McWhinney	1			1	1		3	6
Bottleneck			1		1			2
Saratoga					1		1	2
Robbins					2			2
Snyders					3			3
Bakers Creek		2						2
Jacks Reef			2					2
Madison		2				2	4	8
Fort Ancient					1	1		2
Total	2	13	19	14	9	10	18	85

concave base and a slight bevel on the left side of the broken blade (Figure 6f). Purtill (2009:579) noted that Early Side Notched points appear to be confined to the Unglaciated Plateau portion of Ohio.

The Ray collection contains five Kessel Side Notched points (Broyles 1971:60–61; Justice 1987:67). All five are small (between 23.4 and 41.6 mm long) with diminutive shallow side notches placed close to the base (Figure 6g-k). Basal margins are slightly concave to straight. Cross sections of four specimens are biconvex, whereas the fourth is rhomboid in cross section with alternate bevels on the left edges of the blade. The blade of the shortest specimen has been resharpened to exhaustion (Figure 6j).

Two of the corner-notched types, which appear to be related, are Thebes and St. Charles. A single Thebes point is complete (Figure 7a). The stem is massive with a straight to convex base that is moderately ground. Corner notches are wide and arc upward where they terminate. Blade edges are alternately beveled on the left sides of the blade. The St. Charles type is represented by two specimens, one of which is complete. It exhibits narrow deep corner notches and a straight to convex base that was ground smooth (Figure 7b). Blade edges are convex and unbeveled and the cross section is biconvex. The other specimen consists of the stem only (Figure 7c), which expands rapidly to the base and is extensively ground.

Kirk Corner Notched (inclusive of Palmer) is represented by 11 specimens (Figure 7d-n). Due to repeated resharpenings, no attempt was made to differentiate between large and small varieties of the Kirk type (Broyles 1971:62–65). Except for one broken specimen with a missing distal end (Figure 7d), all appear to have been extensively resharpened. Most exhibit relatively shallow corner notches, expanding stems, and bases that are straight to slightly convex. Bases are generally, but not always, ground. Blade edges are typically slightly convex and unbeveled. Only one specimen appears to have been intentionally serrated (Figure 7m). One specimen typed here as Kirk Corner Notched might represent an unusually small St. Charles point (Figure 7k). The extant corner notch is narrow and deep and terminates in a nearly squared shape that resembles those on St. Charles points. The remnant portion of the base is also moderately ground.

Stemmed Early Archaic point types consist of MacCorkle, Kirk Stemmed, St. Albans, LeCroy, and Kanawha Stemmed. One relatively large MacCorkle point exhibits a lobed stem, deeply concave ground base, and serrated blade edges (Figure 8a). Kirk Stemmed is represented by two specimens. One exhibits a short contracting stem, concave base, and slightly serrated blade edges (Figure 8b). The other specimen also has a short slightly contracting stem and concave base, and a blade that is alternately beveled on the left side (Figure 8c). Two specimens are classified as St. Albans points (Broyles 1971:72–75). They exhibit straight to slightly expanding stems with deep notches in the bases and serrated blades that have been extensively resharpened (Figure 8d-e). Two points are identified as LeCroy (Figure 8f-g). They exhibit straight stems that are deeply notched or bifurcated. Most of the blade of one specimen (Figure 8f) is missing due to a thermal fracture. The other is a straight stemmed fragment, the basal tangs of which are broken (Figure 8g). Four points are classified as Kanawha Stemmed (Broyles 1971:58–59). All complete specimens exhibit short rounded expanding stems with a notch in the base and serrated blades with prominent shoulders (Figure 8h-k). Two have incurvate blade edges.

Figure 7. Early Archaic PPKs: (a) Thebes (ZK); (b-c) St. Charles (NM); (d-h) Kirk Corner Notched (UM); (i) Kirk Corner Notched (UI); (j-l) Kirk Corner Notched (BC); and (m-n) Kirk Corner Notched (ZK).

Middle Archaic (ca. 8000–5000 rcybp)

The Middle Archaic period is represented by two point types. The first is Stanly Stemmed (Coe 1964:35–36). Although it is believed to be Middle Archaic in age (Justice 1987:97), Stanly Stemmed may have had its origins in the Early Archaic period. The single Stanly Stemmed specimen has a short, straight, and relatively narrow stem and a notch in the base (Figure 9a). The blade is straight with prominent shoulders, and the edges are neither serrated nor beveled.

The second Middle Archaic type consists of 10 side-notched points that are typically referred to as Big Sandy II (Justice 1987:60–62), Raddatz (Purtill 2009: Figure 15.3), or Brewerton Side Notched (DeRegnaucourt 1992:164–166). Some Brewerton Side Notched points may extend into the early part of the Late Archaic. These side-notched specimens (Figure 9b-k) are generally smaller than Early Side Notched points, and the side notches likewise tend to be smaller and narrower than those on Early Side Notched (but larger than those on Kessel Side Notched). Bases are typically straight and grinding, if present, is less prominent (note that the base on the specimen in Figure 9g appears to be concave, but most of it is missing due to fracture scars). Blade edges of Big Sandy II points lack serrations and bevels. One specimen (Figure 9j) was reworked into a hafted end scraper.

Figure 8. Early Archaic PPKs: (a) MacCorkle (NM); (b) Kirk Stemmed (UM); (c) Kirk Stemmed (BC); (d) St. Albans (UM); (e) St. Albans (ZK); (f) LeCroy (UM); (g) LeCroy (UI); (h) Kanawha (ZK); (i-j) Kanawha (BC); and (k) Kanawha (UI).

Late Archaic (ca. 5000–3000 rcybp)

Seven stemmed point types are associated with the Late Archaic period. Two types are represented by six specimens each. The first type is McWhinney Heavy Stemmed (Justice 1987:138–139), a morphological equivalent of which appears to be Karnak Stemmed. All six McWhinney Heavy Stemmed specimens are thick, ranging between 8.8 and 11.9 mm with a mean of 10.2 mm (Figure 10a-f). Maximum thickness occurs at the juncture of the blade and stem or along the lower half of the blade. Broad flake scars across the blade were produced primarily by percussion. Stems are straight to slightly contracting with straight to slightly convex or slightly concave bases. The second type is Lamoka (Ritchie 1961:29). Specimens of this type exhibit weak to moderately prominent broad side notches, expanding stems, and straight to slightly convex bases (Figure 10g-l). Blades are typically crudely flaked and moderately thick (range: 7.2–11.2 mm; mean: 8.5 mm). One exhibits an impact fracture (Figure 10g).

Two types are represented by two specimens each. The first type is Saratoga (Justice 1987:154–157). Both specimens have short, slightly expanding stems and flat fractured bases (Figure 11a-b). A flat fractured base is a key attribute. Although the fractured base of this type

Figure 9. Middle Archaic PPKs: (a) Stanly (BC); (b-c) Big Sandy II (NM); (d) Big Sandy II (UI); (e-h) Big Sandy II (ZK); and (i-k) Big Sandy II (UM).

has been characterized as "snapped" (Justice 1987:154–157), the truncated surface was produced by removing a burin spall rather than bending or snapping a longer stem (Ray 2016:113). A second key attribute produced by removing sharp lips left by burin scars is the presence of multiple small pressure flake scars oriented from the truncated base toward the distal end. Both Saratoga specimens from the Little Hocking River valley exhibit these short, trimming, pressure flake scars on both faces. The second type is Bottleneck Stemmed (Justice 1987:124–126), which appears to be an eastern correlate of Table Rock Stemmed points found primarily in the Ozarks region west of the Mississippi River (C. Chapman 1975:257–258; Ray 2016:123–125). Both Bottleneck Stemmed specimens have expanding stems and convex bases, the margins of which are lightly to moderately ground (Figure 11c-d). Both specimens also exhibit prominent impact fractures, indicative of projectiles. An attempt appears to have been made to rework the larger specimen into a hafted end scraper after it was fractured by impact.

Figure 10. Late Archaic PPKs: (a) McWhinney (VP): (b-d) McWhinney (UI); (e) McWhinney (ZK); (f) McWhinney (LG); (g) Lamoka (UI); (h) Lamoka (BC); (i) Lamoka (LG); and (j-l) Lamoka (ZK).

Three types are represented by single specimens. One exhibits a slightly expanding stem and concave base and appears to be a Savannah River Stemmed point (Coe 1964:44–45). Only a small portion of the lower portion of the blade is present, which exhibits one prominent unbarbed shoulder (Figure 11e). One square-stemmed fragment appears to represent a Genesee point (Figure 11f) (Justice 1987:159). One large specimen with a short straight stem, straight base, and prominent unbarbed shoulders is classified as Ledbetter Stemmed (Figure 11g) (Justice 1987: 149 –150). The blade appears to have been finished entirely by percussion flaking, producing broad random flake scars.

Early Woodland (ca. 3000–2200 rcybp)

The Early Woodland period is represented by two Robbins points (Figure 11h-i) (Justice 1987:186–189). One complete specimen has a straight stem and slightly convex base. The blade is broad with slightly upsloping shoulders. The other Robbins point is fractured longitudinally; however, the remaining portions exhibit a straight stem, a slightly convex base, and a straight shoulder.

Figure 11. Late Archaic and Early Woodland PPKs: (a) Saratoga (VP); (b) Saratoga (UI); (c) Bottleneck (VP); (d) Bottleneck (UM); (e) Savannah River (UM); (f) Genesee (UI); (g) Ledbetter (BC); and (h-i) Robbins (VP).

Middle Woodland (ca. 2200–1500 rcybp)

The Middle Woodland period is represented by two point types. The first is Snyders. One specimen that exhibits broad U-shaped corner notches, an expanding stem, a slightly convex base, and barbed shoulders is a classic Snyders point with a resharpened blade (Figure 12a). The other two specimens could be classified as Affinis Snyders (Justice 1987:204). One exhibits a broad blade, corner notches, a short expanding stem, and straight to slightly convex base (Figure 12b). Although only a portion of the blade is present, it exhibits prominent barbs and well-controlled flaking on both faces. The other Affinis Snyders is smaller with rounded corner notches and a relatively narrow stem (Figure 12c).

The second type is Bakers Creek (or Lowe Flared Base), represented by two specimens (Cambron and Hulse 1975:8; Justice 1987:210–213). Both have expanding stems with straight bases and slight unbarbed shoulders (Figure 12d-e).

Late Woodland (ca. 1500–1000 rcybp)

The Late Woodland period is represented by two Jacks Reef Corner Notched dart points (Figure 12f-g). Both exhibit deep up-arching corner notches and straight bases, and both have thin blades with maximum thicknesses of 5.2 and 5.3 mm.

Late Prehistoric (ca. 1000–300 rcybp)

The Late Prehistoric period, as presented here, includes the separate entities of the Mississippian and Fort Ancient manifestations. While there are similarities and differences between them with overlapping territories during various portions of the Late Prehistoric period, it is presumed that Fort Ancient held sway over southeastern Ohio and the middle Ohio River valley (Griffin 1966; Henderson 2008; Pollock 2008). Although it is recognized that Fort Ancient flintknappers made both serrated and unserrated arrow points, unnotched triangular arrow points have been divided into two types.

The first is Madison (or Hamilton), of which there are eight unserrated specimens. Five are relatively large and appear to be unresharpened (Figure 12h-l). Four complete specimens range between 32.9 mm and 38.9 mm in length. Three shorter specimens with lengths between 17.2 and 23.8 mm might be classified as Levanna, but they could also represent extensively resharpened Madison points or arrow points that were rejuvenated after distal ends were broken (Figure 12m-o). The second arrow point type is Fort Ancient, represented by two broken specimens. Both exhibit shallow serrated blade edges (Figure 12p-q). One has an impact fracture scar, and the other has a transverse fracture. As noted above, eight small and thin triangular bifaces with straight bases appear to be arrow point preforms (Figure 5i-o).

Unidentified Point Types

Fifteen complete or nearly complete PPKs could not be confidently identified as to type but might be associated with a particular type or time period by some investigators. Two corner-notched specimens exhibit short expanding stems with indented bases, slightly serrated blade edges, and short barbs (Figure 13a-b). It appears likely they represent an Early Archaic point type. Two small corner-notched specimens have expanding stems, straight to slightly convex bases, and prominent barbs (Figure 13c-d). Flaking across the blades was well-executed by controlled systematic pressure flaking. In some respects, they resemble Palmer Corner Notched points; however, the bases of the stems are not as wide as on typical Palmer points and the blades do not appear to have been intentionally serrated. Both points were found on a gravel bar at the mouth of Short Brook on the main stem. Two other small PPKs exhibit short straight stems and concave bases (Figure 13e-f). The corner tangs appear to have been ground. The attributes of these specimens resemble the Early Archaic Jude type from Alabama described by Cambron and Hulse (1975:71), but it is unclear if the range of this type extended as far north as southeastern Ohio.

Two corner-notched specimens exhibit expanding stems and straight to slightly concave bases, but the most prominent attributes are along blade edges. Both exhibit recurved (or re-angled) blades that sharply angle toward the distal end at inflection points approximately halfway up the blades (Figure 13g-h). Although the blade and stem shapes resemble Afton points found in the Ozarks west of the Mississippi River (Ray 2016:20–22), this point type does not appear to have been documented in the upper Ohio River valley. In addition, Afton points are typically thin (mean 6.3 mm) and flat or tabular in cross section, whereas the two specimens from the study area are slightly thicker and distinctly biconvex in cross section.

One specimen exhibits fine uniform pressure flaking, well-defined narrow corner notches, a straight unground base, an unserrated and unbeveled straight blade, and a flat thin (4.7 mm) cross section (Figure 13i). In contrast, another corner-notched specimen, which was made from a large

Figure 12. Middle Woodland, Late Woodland, and Late Prehistoric PPKs: (a) Snyders (VP); (b-c) Affinis Synders (VP); (d-e) Bakers Creek (BC); (f-g) Jacks Reef (UM); (h-i, n-o) Madison (UI); (j-k) Madison (BC); (l-m) Madison (NM); (p) Fort Ancient (VP); and (q) Fort Ancient (NM).

recurved flake blank, exhibits relatively crude random flaking, a slightly convex base, and an excurvate blade (Figure 13j). The remaining five corner-notched specimens are relatively nondescript (Figure 13k-o).

Chert Availability and Use

Determining the availability and distribution of various chert resources in and around the Little Hocking River valley is crucial to interpretations of prehistoric chert procurement and use. The identification of local vs. extralocal resources enables interpretations of mobility and/or exchange patterns.

<u>Availability</u>

Chert resources are scarce in unglaciated areas along the Ohio River (Purtill 2009:571), and the same is true in the Little Hocking River valley. However, local chert deposits are not entirely absent. As noted above, Glenn collected practically every piece of chert that he found on gravel bars of the Little West Branch and the West Branch, including unmodified natural gravel. The bulk of this redeposited chert gravel (n=47) exhibits similar physical attributes and may have come from one or more unidentified Pennsylvanian or Permian rock units that crop out within the Little Hocking drainage basin. Since relatively few pebbles/cobbles were found during 18 years of survey, it appears that chert is not common within the rock unit(s). Based on form, the chert occurs in small nodules and thin discontinuous beds. Cortical surfaces are often white and pitted. It occurs in relatively small angular to subangular cobbles and pebbles. Maximum length

Figure 13. Unidentified PPKs.

ranged between 19.6 and 93.1 mm and maximum thickness ranged between 14.1 and 37.4 mm; however, most were less than 55 mm long and 30 mm thick. It is predominantly grayish brown (10YR 5/2) and brown (10YR 5/3) but may be gray (10YR 5/1). Internal structure ranges from homogenous to mottled. It is fine-to-medium grained with a moderate-to-high luster. It appears to be nonfossiliferous. Attributes that help to identify some of this chert are small botryoidal-like spheres that may be translucent, white, or brown and scattered white quartz inclusions. Incipient fracture planes and other inclusions sometimes reduce its knapping quality. Nevertheless, some fine-grained pieces are glass-like and exhibit good knapping quality. However, because the redeposited cobbles of this local chert gravel are relatively small, typically only expedient flake blanks and small unifacial or bifacial tools could be made from it.

Three small subangular pebbles of dark gray to black Upper Mercer chert were also collected. They measure between 36.7 and 51.6 mm long and 16.0 and 19.1 mm thick and would be unproductive for the manufacture of most chipped-stone tools. Based on the absence of Upper Mercer deposits in the Little Hocking River valley, it appears that these pieces were transported to the study area. The remainder of the gravel consisted of six unidentified small pieces of chert.

Because chert in the local gravel deposits is rare and most pebbles/cobbles are small and not suitable for the manufacture of sizeable bifacial tools, the vast majority of the chert found in the Little Hocking River valley was imported as raw material (e.g., see large working core above) or as preforms and finished tools made elsewhere. Five previously described chert types (DeRegnaucort and Georgiady 1998; Holland 2005:20–21; Murphy 1989:30–37) were identified in the Ray collection. All but one are found in southeast Ohio and derive from Pennsylvanian rock units.

The closest bedrock chert source appears to be Brush Creek (also known as Crooksville). It crops out in neighboring northwestern Morgan and southwestern Athens counties, and in eastern Perry, northern Meigs, eastern Vinton, eastern Jackson, southern Gallia, and northern Lawrence counties (DeRegnaucort and Georgiady 1998:38; Murphy 1989:35–36). It is typically light brown, dark gray, and tan and contains fossils (brachiopods, crinoids, and sponge spicules) and veins of bluish-gray chalcedony. Weathered or patinated surfaces often exhibit a reddish brown mottled appearance (DeRegnaucort and Georgiady 1998:38). In adjacent areas, this chert appears to have been used extensively.

Well-known Upper Mercer chert also outcrops to the west of the study area in Coshocton, Muskingum, Perry, Hocking, and eastern Licking counties (DeRegnaucort and Georgiady 1998:80; Murphy 1989:33). Thinner deposits of Upper Mercer chert also occur in Vinton and northern Jackson counties (Richard Walker, personal communication 2022). Its distinctly mottled blue-gray variety with occasional thin bluish white veins of chalcedony or crystalline quartz is best known, but it also occurs in solid black and gray varieties. Fossils are common in this chert. The black variety of Upper Mercer chert is similar to black Zaleski chert but differs from it in the presence of fossils (DeRegnaucort and Georgiady 1998:80) and faint bluish white mottles under low magnification. Upper Mercer chert was intensively quarried in Coshocton County and a localized area in Perry County, and it was utilized extensively throughout eastern Ohio and adjacent areas during all prehistoric time periods (DeRegnaucort and Georgiady 1998:81; Murphy 1989:33).

Outcrops of Zaleski chert are more localized and found to the southwest of the study area in southern Vinton and northern Jackson counties (DeRegnaucort and Georgiady 1998:93; Murphy 1989:34). Although quite variable in appearance, Zaleski chert typically occurs in jet black and brownish black colors and contains very few or no fossils. It may be lustrous or nonlustrous and has few inclusions. Murphy (1989:34) suggests that black Zaleski chert cannot be differentiated from black Upper Mercer chert; however, DeRegnaucort and Georgiady (1998:80, 93) indicate that it can be differentiated by its high luster, few inclusions and veins of chalcedony, and lack of fossils. These distinctions were used in differentiating Zaleski chert from the black-colored variety of Upper Mercer chert. Although exploited less extensively than Upper Mercer chert, Zaleski chert appears to have been favored by some groups living in proximity to its outcrop area (DeRegnaucort and Georgiady 1998:93). This material was quarried in central Vinton County (Richard Walker, personal communication 2022).

Vanport (also known as Flint Ridge) chert is perhaps the most famous chipped-stone resource in Ohio. The primary deposits (highest quality and most intensively quarried) are located in eastern Licking, western Muskingum, and northern Perry counties (Carlson 1987:415–416); however, smaller localized deposits also occur in Hocking, Vinton, Jackson, and southwest Perry counties (DeRegnaucort and Georgiady 1998:52–56; Murphy 1989:34–35). This highly colorful chert occurs in several varieties, most of which are fine grained and lustrous (Carlson 1987:416–418; DeRegnaucort and Georgiady 1998:52–67). Vanport chert was quarried extensively in southeast Licking County and other localized areas, used throughout prehistory, and traded widely across Ohio and adjacent states.

The fifth nonlocal chipped-stone resource is a high-quality, fine-grained chert found in various facies of Mississippian limestones such as St. Louis, Ste. Genevieve, and Newman (or Paoli) across portions of Kentucky, southern Indiana, and southern Illinois. This chert has a number of different regional names, but hereafter it will be referred to as simply Newman chert, which is the closest source area (northeast Kentucky) to the project area. Colors include dark gray, bluish gray, brownish gray, light gray, and pale brown (Ray 1998:19–21). This chert was widely traded across the Midwest (Purtill 2009:571). No artifacts were identified as made from Kanawha chert, a nonlocal dull, grainy, dark gray chert found in western West Virginia.

Procurement and Use

Artifacts selected for determining raw material procurement and use included cores, initial reduction debitage (primary and secondary flakes), biface flakes, and preform failures/rejects. These artifact types best reflect on-site manufacture and maintenance of chipped-stone tools. A chert analysis of selected debitage and preforms is presented in Table 4. Unfortunately, debitage and preforms collected from the surface of gravel bars yield no information on the use of chert resources through time. Finished complicated tools such as PPKs represent items that were often transported from one locale to another until they were broken and/or exhausted and then discarded. As such, they may reflect tool manufacture at other locations and are only generally representative of raw material exploitation. Nevertheless, they are the only diagnostic artifacts in the Ray collection that can provide some indication of diachronic selection and preference of exploited chert resources. The 85 diagnostic artifacts from the study area were classified as to chert type in Table 3. However, because any one point type is represented by so few specimens, diagnostic artifacts were grouped by time period in Table 5.

Artifacts exhibiting relict cortical surfaces (primarily cores and decortication flakes but also a few preforms) were also analyzed to determine the source(s) from which each raw material was procured. Artifacts with angular, grainy, nonabraded cortical surfaces were classified as obtained from bedrock or residual sources, whereas those exhibiting smooth water-worn, patinated cortical surfaces were classified as procured from alluvial sources, i.e., gravel bars (Ray 2007:26–29). Since all artifacts in the Ray collection had been redeposited from sites located some distance upstream, differentiation of alluvial vs. residual/bedrock cortical surfaces was sometimes difficult, resulting in nine indeterminant cortical specimens. However, if cortical artifacts exhibited rounded and abraded surfaces that were two times or more than that on noncortical, flaked surfaces, they were classified as procured from alluvial sources (Table 6).

Of a sample of 145 pieces of debitage and preforms that could be confidently identified as to raw material type, nonlocal Upper Mercer chert was most common, comprising one-third of the sample (Table 4). The bulk of these artifacts consists of biface flakes, which suggests that most of the Upper Mercer chert that was transported to the study area arrived as early-to-middle-stage preforms. Four examples of aborted and failed middle-to-late-stage preforms knapped from Upper Mercer chert are presented in Figure 5c-f, and selected examples of PPKs are presented in

Table 4. Selected debitage and preforms by chert type.

Artifact Type	Local Gravel	Upper Mercer	Brush Creek	Zaleski	Vanport	Newman	Total	Unidentified
Core/Tested Cobble	1		1	0	0	0	2	1
Primary Flake	6	1	2	2	0	0	11	5
Secondary Flake	10	7	8	4	6	0	35	6
Biface Flake	2	28	3	17	8	2	60	10
Bipolar Core/Flake	7	4	3	2	0	0	16	19
Preform	1	9	4	3	3	1	21	9
Total	27	49	21	28	17	3	145	50
Percentage	18.6	33.8	14.5	19.3	11.7	2.1	100.0	

Table 5. Diagnostic artifacts by time period and chert type.

Time Period	Local Gravel	Brush Creek	Upper Mercer	Zaleski	Vanport	Newman	Unidentified	Total
Late Prehistoric		2			1	3	4	10
Late Woodland			2					2
Middle Woodland		2			3			5
Early Woodland					2			2
Late Archaic	2	2	2	4	3		6	19
Middle Archaic		1	3	4		2	1	11
Early Archaic		6	11	6		5	7	35
Late Paleoindian			1					1
Total	2	13	19	14	9	10	18	85

Figures 7d-h and 12f-g. More diagnostic artifacts were manufactured from Upper Mercer chert (n=19) than any other chert type (Table 3). Although represented in five separate time periods, it appears to have been used most frequently during Early Archaic times (Table 5). Upper Mercer chert was procured from both residual/bedrock and alluvial sources (Table 6). Whereas it was frequently quarried, Murphy (1989:33) noted that redeposited cobbles of Upper Mercer chert constituted an important secondary source in the Hocking River valley.

Nonlocal Zaleski chert, which comprised nearly one-fifth of the sample of debitage/preforms (Table 4), also appears to have been imported largely as preforms and subsequently reduced to tool form in the study area. Like Upper Mercer, Zaleski chert appears to have been procured from both alluvial and residual/bedrock sources. Fourteen PPKs were manufactured from Zaleski chert, four of which are depicted in Figure 9e-h. This chert type appears to have been used most often during Archaic times.

Table 6. Cortical artifacts by chert type and chert source.

Chert Type	Alluvial	Bedrock/Residual	Indeterminant	Total
Local Gravel	24	0	0	24
Upper Mercer	7	6	2	15
Brush Creek	8	2	5	15
Zaleski	3	3	2	8
Vanport	2	6	0	8
Newman	0	1	0	1
Total	44	18	9	71

The third most common chert type in the analyzed sample of debitage/preforms is local gravel, obtained entirely from gravel bars. This unnamed chert type is represented primarily by early-stage reduction debitage and only one preform (Figure 5a) and two PPKs (Figure 10f, i). This suggests that although local chert gravel was frequently tested for knapping quality, relatively little of it was finished into bifacial chipped-stone tools.

Nonlocal Brush Creek chert is also well represented in the debitage/preform sample, but less so than the above types. Four preforms (Figure 5g-j) and 13 PPKs, representing five time periods, were made from Brush Creek chert (Table 5). Unlike Upper Mercer and Zaleski, some of it may have been carried to the study area in the form of cores (e.g., large working core referred to above), probably because its source area is closest to the Little Hocking River valley. Cortical surfaces indicate that most of this chert may have been procured from alluvial sources. Brush Creek chert, which is commonly found in alluvial deposits along the lower Hocking River valley in southeast Athens County, was widely used in that area (Murphy 1989:35).

Seventeen artifacts made from nonlocal Vanport chert are represented in the debitage/preform sample (Table 4). Some small cores may have been carried to the study area, but most of this raw material was probably imported in the form of early-to-middle-stage preforms. Although the sample is small, most of it appears to have been procured from residual/bedrock sources. Vanport chert (Figure 11a, h-i) is not represented in the earliest three time periods, but it appears to have been used frequently during Late Archaic, Early Woodland, and Middle Woodland times (Table 5).

Only one preform and two biface flakes made from nonlocal Newman chert are present in the debitage/preform sample (Table 4). Although the majority of this most distant chert probably arrived in the study area as finished curated tools, some of it may have arrived in the form of middle-to-late-stage preforms. Whereas debitage is scant, 10 diagnostic artifacts were made from high-quality Newman chert (Table 3). It is represented by Early Archaic (Figure 6f, k), Middle Archaic (Figure 8a), and Late Prehistoric (Figure 12l-m, q) points. Murphy (1989:35) indicated that Late Prehistoric knappers relied primarily on local raw materials including gravel deposits; however, the presence of three arrow points made from Newman chert suggests a connection with areas to the southwest in northeastern Kentucky.

Fifty additional pieces of debitage/preforms and 18 PPKs were unidentified as to chert type (Table 4), partly due to heavy patina on the surfaces of some specimens. Some of these may have been procured locally from gravel deposits of the Ohio River.

Based on the available data, it appears that nonlocal Upper Mercer chert was the most common chipped-stone raw material to have been imported into the chert-poor Little Hocking River valley and reduced into tools. Supplemental nonlocal resources included Zaleski, Brush Creek, and Vanport. Local redeposited chert pebbles were also used, but they were unlikely to have been an important resource due to scarce quantities and small size. The above data should be viewed as preliminary indications of chert procurement and use in the Little Hocking River valley. Results are based on surface collections from gravel bars, and sample sizes for nondiagnostic and diagnostic artifacts are not large. Indications of temporal trends provided by diagnostic artifacts are especially preliminary. Accordingly, more substantial data on diachronic procurement and use of chert resources in the study area will have to wait until large lithic assemblages are recovered from excavated (ideally stratified) contexts.

Reported results of chert use in the adjacent lower portion of the Hocking River valley, from which much of the chert in the study area was probably procured, are mixed. Abrams and DeAloia (2005:62, Table 4.1) and Abrams et al. (2005:143, Table 9.3) reported that Brush Creek chert dominated Late Archaic/Woodland and Late Prehistoric lithic assemblages with lesser amounts of Upper Mercer, Zaleski, and Vanport cherts. For roughly the same time periods, Murphy (1989:93–284) reported that Upper Mercer chert (inclusive of Zaleski chert) prevailed at most sites, supplemented by Vanport, pebble, and Brush Creek cherts.

Summary and Conclusions

The Ray collection represents an assemblage of redeposited artifacts, but it provides important data on chert resource exploitation and the occupation and use of a small, little-known river valley in which few professional investigations have been made. The collection was obtained primarily from gravel bars of the Little West and West branches in the lower Little Hocking River valley, but it is presumably representative of the rest of the drainage basin. Its contents (including 85 diagnostic specimens) are valuable in demonstrating the presence/absence of people in the valley during certain prehistoric time periods. A surface collection this large and diverse is not easily obtainable from the study area. Cultivated land is not common in the Little West and West branches due to narrow valley floors, and where present, early cultural remains (e.g., Paleoindian, Early Archaic, and Middle Archaic) are likely too deeply buried to be exposed and found, other than from natural stream erosion and artifact redeposition in gravel bars.

Nonperishable chipped-stone artifacts comprise but a small part of any cultural assemblage, but they are generally the only items that survive thousands of years of weathering in soils and on the surface of gravel bars. As a result, local subsistence patterns (see Purtill 2009:586–587 and Abrams and Freter 2005) cannot be addressed, and relatively little can be said about settlement patterns. However, data obtained from diagnostic and nondiagnostic chert artifacts can enlighten diachronic occupation frequency in the Little Hocking River valley and indicate patterns of raw material procurement and use. The data results presented here add to that previously presented for the neighboring Hocking and Muskingum river valleys.

To date, no fluted points have been reported from the study area. Based on the presence of a single Hardaway Side Notched point, it is unclear if the lower Little Hocking River valley was inhabited during the Late Paleoindian period, or whether the area was only occasionally exploited for plant and animal resources. However, based on the number of diagnostic artifacts from the Early Archaic and each of the succeeding prehistoric time periods, it is clear that the lower Little Hocking River valley was inhabited at least periodically and perhaps consistently for more than 10,000 years.

As for the rest of Ohio (Purtill 2009:582), the entire Little Hocking River valley had likely been explored and occupied by Early Archaic times. No less than 10 separate point types in the Ray collection are affiliated with the Early Archaic. The concept of "one point type—one culture" has long been debated by archaeologists. Some view discrete point types as sensitive group identity markers that reflect specific ethnic groups (Litfin 1993; McElrath et al. 2009:331, 357; Morse 1996:426; Stafford and Cantin 2009; Vickery 1980), whereas others believe that a group of related knappers could have produced multiple point types (Ahler and Koldeholf 2009:225; Ahler et al. 2010:67; Brose 1975). However, the evidence from deep and discretely stratified alluvial deposits at St. Albans (Broyles 1971) in West Virginia, Icehouse Bottom (J. Chapman 1977) and Rose Island (J. Chapman 1975) in Tennessee, Longwick-Gick in Kentucky (Collins 1979), James Farnsley in Indiana (Stafford and Cantin 2009), and Big Eddy in Missouri (Lopinot et al. 2005; Lopinot and Ray 2010; Ray et al. 1998) support the contention that individual PPK styles are representative of different ethnic groups throughout most of prehistory.

Discrete occupational horizons at these deep, stratified sites typically yielded a single point type or two or more types of similar hafting technology. At a minimum, the evidence from these sites dispels the notion that multiple point styles with different hafting technologies (e.g., side-notched, corner notched, and/or stemmed points) were produced by a single ethnic group. On the other hand, two point types that have similar design and hafting technologies (e.g., Thebes and St. Charles) could be related or contemporaneous, or even part of a common toolkit. If this concept is accurate, the lower Little Hocking River valley was occupied, albeit probably short term, by several successive Early Archaic groups for at least 2000 years. Multiple groups also occupied the study area during Middle Archaic, Late Archaic, and Middle Woodland times, whereas one group may have been present during Early Woodland, Late Woodland, and Late Prehistoric times.

The artifacts in the Ray collection were obtained as a result of chance erosion and redeposition onto gravel bars from nearby sites and represent a random sample. Although it is risky to equate numbers of PPKs to numbers of people, they may serve as relative population proxies through time. Given that assumption, Table 7 is based on the number of typed PPKs per time period/1000 years. These calculations suggest that the lower Little Hocking River valley was occupied most intensively during the Early Archaic and Late Prehistoric periods, followed by the Late Archaic, Middle Woodland, Late Woodland, Middle Archaic, Early Woodland, and Late Paleoindian periods. Regardless of the above propositions that there were greater or lesser populations in the study area during certain time periods, the Little Hocking River valley was consistently exploited for its natural resources for a very long time.

A significant presence in the small valley of the Little Hocking during Late Prehistoric times is evident. If the eight small triangular preforms (likely arrow point preforms) are combined with the 10 finished triangular arrow points, then the postulated population density in the study area for Late Prehistoric would have been greater than that during the Early Archaic. Previous studies have highlighted the presence of numerous Late Prehistoric sites in the Unglaciated Plateau area of southeast Ohio (Abrams et al. 2005; Brown 1981; Murphy 1989:231–331; Wakeman 2005).

Table 7. Relative population proxies by time period.

Time Period	No. of PPKs	Yrs	No. PPKs/1000 Yrs.
Late Prehistoric	10	700	14.3
Late Woodland	2	500	4.0
Middle Woodland	4	700	7.1
Early Woodland	2	800	2.5
Late Archaic	19	2000	9.5
Middle Archaic	12	3000	3.7
Early Archaic	35	2000	17.5
Late Paleoindian	1	500	2.0

There are not many point types common to the middle Ohio River region between Archaic and Late Prehistoric times that are missing from the Ray collection. All of the Early Archaic types found at St. Albans (Broyles 1971), except Charleston Corner Notched (a variant of Kirk Corner Notched), are represented. Eva, Morrow Mountain, Sykes/White Springs, Matanzas, Merom/Trimble, and Wade points are absent, but their ranges of distribution do not appear to extend into southeast Ohio (Justice 1987:103–183). Three point types that range into southeast Ohio appear to be missing. Lost Lake is not represented, but it is part of the Thebes/St. Charles cluster that is represented by several specimens. The only two types that are clearly not in the collection are Decatur (Early Archaic) and Adena (Early Woodland).

Since the vast majority of artifacts in the Ray collection came from redeposited contexts, specific landforms that were occupied have not been identified. Nevertheless, preliminary surveys in the Little West and West branches suggest that multiple alluvial landforms of probable early-middle and middle-late Holocene age are present. It is also possible that some artifacts came from eroding ridge summits/slopes boarding these streams. None of the above landforms have been adequately investigated and tested. Only careful and intensive future archaeological surveys and deep test excavations will help clarify diachronic settlement patterns in the Little Hocking River valley.

Mortuary practices are likewise unknown in the study area. One small mound (33WN438) was reported and provisionally recorded as a possible prehistoric mound in Cold Spring Hollow, a small tributary of the Little West Branch, but its natural or cultural origin has not been determined. Earthen mounds were constructed in southeast Ohio and along the Ohio River valley during Woodland times (Abrams and Freter 2005; Carskadden and Morton 1997; Murphy 1989:122–229), but they are typically located at the confluence of large streams, especially where tributary rivers join the Ohio River (e.g., the Marietta Earthworks).

Because local redeposited chert in the Little Hocking River valley is so scarce and occurs in relatively small cobbles and pebbles, prehistoric knappers imported most of their chipped-stone raw material. Five nonlocal chert resources are represented. Contrary to the notion that the rugged unglaciated terrain in southeast Ohio acted as a buffer for the southern transport of nonlocal Upper Mercer and Vanport cherts (Purtill 2009:571–572), both are well represented in the lower Little Hocking River valley. Indeed, debitage/preforms and finished tools suggest that Upper Mercer chert was the preferred chipped-stone resource during most of prehistory with the possible exceptions of the Early Woodland and Middle Woodland periods. Supplemental chert resources included Zaleski, Brush Creek, and Vanport. The mode of transportation of these nonlocal resources is indeterminant, but it is likely that both direct procurement and trade played a role. Perhaps much of the closest chert resource (Brush Creek) was procured directly, whereas trade may have been more important in obtaining three more distant resources (i.e., Upper Mercer, Zaleski, and Vanport), at least during the last two millennia. Finally, the majority of Newman chert probably arrived in the Little Hocking River valley via tool curation.

The primary lithic reduction strategy in the study area involved decortication of chert cobbles and subsequent reduction of cobble blanks or flake blanks into preforms and ultimately into unifacial and bifacial tools by direct freehand percussion and pressure flaking. Some bipolar percussion was performed on smaller cobbles, but it appears to have been relatively rare and largely incidental to tool making.

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