THE ARCHAIC PERIOD IN THE FALLS OF THE OHIO REGION OF KENTUCKY

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Introduction

eorge Rogers Clark is the person generally Jacknowledged to have had the earliest interest in prehistoric antiquities of the Falls of the Ohio Region. Although Clark might have investigated some of the mounds and cemeteries in the area, he left no written documentation of his In a short interview he did make exploits. mention of some of his activities, however (Campbell 1815:458-463). The next person to take interest in the Falls area was Constantine Samuel Rafinesque, who in 1824 while a professor Transylvania University Lexington, published Ancient History or Annals of As noted by Janzen (1972:310) Kentucky. however, Rafinesque's site locations were vague and ambiguous, and of little value to later Construction of the Louisville and scholars. Portland canal around the Falls in the years 1826-1830, unearthed extensive deposits of prehistoric materials, many of which were from deeply buried alluvial contexts. Little or no subsequent investigation was conducted, however. By the mid-1870's the geologic surveys of Kentucky and Indiana were including information about archaeological sites and materials in some reports. For example, in Kentucky N.S. Shaler prepared On the Prehistoric Remains of Kentucky, the first synthesis of its type for the state, while at the same time the Indiana Geological Survey under the direction of state geologists E.T. Cox, was also devoting considerable attention to prehistoric sites in the Falls Area (Janzen 1972:312). Geological survey reports for Clark and Floyd counties, Indiana, noted a number of sites near Clarksville, including what might have been an extensive shell midden. A number of investigators, including Borden (1874), Cox (1875) and Putnam (1975), visited the Stone Fort site situated on top a prominent hill known as the "Devils Backbone." John Collett, also of the Indiana Geological Survey, conducted surveys in Harrison and Crawford counties from 1876-1878. Although the primary concern of the reports was to describe the local geology, Collett did note the

presence of two large sites located along the Ohio River and included a map which depicted the locations of 11 aboriginal chert quarries. As noted by Janzen (1972:315) this was the first mention of chert resources in the Falls area. Gerard Fowke made an early effort to locate chert quarries and "village" sites in Harrison County, Indiana (Fowke 1928).

Following the brief flurry of archaeological activity conducted in the Falls area during the 1870's a period of inactivity commenced, and it was not until the 1930's that serious students of prehistory once again took interest in the Falls Area. E.Y. Guernsey, working under the direction of Glenn A. Black, conducted an extensive survey in the Falls area, but his report An Archaeological Survey of Clark, Floyd, and Harrison Counties was never published. However, through the Indiana Academy of Science he did publish three articles relevant to Falls prehistory; these were Certain Southern Indiana Sources of Lithic Artifact Material (1937), Relationships Among Various Clark County Sites (1939), and The Culture Sequence of Ohio Falls Sites (1942). Based on Guernsey's work in the Falls Area, including excavations at the Clark's Point, Elrod, and Newcomb sites in Clark County, he developed the first cultural sequence for the area. Guernsey's data indicated a three stage cultural sequence, with the most recent occupation being represented by Fort Ancient-like ceramics. This was preceded by a Middle Mississippian ceramic component, which in turn was preceded by a shell midden occupation. It was noted that the latter shared considerable similarity with Webb's Indian Knoll materials from the Green River region.

During the 30 year period of the 1940-60's there was little professional archaeological activity in the Falls area, though local artifact collectors amassed large collections of artifacts from construction sites associated with urban expansion and road development in the greater Louisville area. It was not until the mid-1960's that professional interests were once again renewed in the Falls Area. In 1966 James Bellis and John Dorwin, then students at Indiana University, conducted excavations at the Breeden site (12HR11) in Harrison County, Indiana (Bellis 1968). The site consisted of a Late Archaic shell midden component and a more ephemeral Early Woodland occupation which was restricted to the

upper levels. In the late 1960's and early 1970's a long-term research program centered in the Falls area was initiated by Donald Janzen. Goals of the program were "... to explain the cultural systems of Archaic and Woodland in the Falls area, with emphasis on the settlement and subsistence patterns, and to derive testable hypotheses for explaining the cultural changes from Archaic to Early Woodland" (Janzen 1972:374). In 1969 the University of Louisville initiated Archaeological program under the direction of Joseph Granger which has focused on the archeology of the Falls Area. Also, the Glenn A. Black Laboratory of Archaeology, Indiana University, conducted floodplain surveys in Harrison, Floyd, Clark and Jefferson counties in 1973. However, Seeman and Limp's survey in Harrison County is the only published report In addition to examining (Seeman 1975). Seeman Reidhead floodplain tracts and reexamined chert quarries reported by Fowke as well as other upland lithic workshops.

The first use of mechanical excavation to investigate deeply buried sites in the Falls Area were conducted by Indiana University at sites located in the Clark Maritime Centre (Munson 1975). Additional investigations of buried sites in the Ohio River floodplain were conducted by the University of Kentucky in Jefferson County, Kentucky, in 1976 to mitigate impacts to four buried sites (Dobbs and Dragoo 1976; Collins In 1977 the University of Kentucky 1979). conducted mitigation at four of the buried sites located during testing. These included the Longworth-Gick, Rosenberger, Villier. Spadie. In 1981 Resource Analysts Inc., conducted data recovery at three sites, 12CL92, 12CL106, and 12CL109, located in the Clark Maritime Centre Archaeological District

During the last two decades the University of Louisville has conducted extensive research in the Falls Area. Some important sites examined in the Louisville area include Arrowhead Farm (Mocas 1976), Minor's Lane and Habich (Granger and Tobbe-Bader 1988; Granger et al. 1992) Lone Hill (Granger 1993), KYANG (Tobbe-Bader and Granger 1989), McNeeley Lake (Granger 1985) and Durrett. From this research, and that undertaken by others in the area, Granger (1986, 1988) has developed preliminary definitions for

the late Middle Archaic Old Clarksville phase and the Late Archaic Lone Hill phase.

Falls Area Archaic Cultural Chronology

The discussion which follows provides an overview of the Archaic culture sequence for the Falls of the Ohio Area in Kentucky and Indiana. Based on a suite of radiocarbon dates temporal limits for the Archaic period have been established at approximately 9950 to 2950 B.P. within the region, though dates extending to 2750 B.P. would not be unexpected. The Archaic, which is traditionally divided into Early, Middle, and Late sub-periods, represents a period of time when pre-ceramic hunter-gatherer populations occupied the region. As discussed elsewhere in this report it was during the latter portion of the Archaic that the primary occupation(s) of the Railway Museum site (15JF630) took place.

During the last three decades surface surveys and excavations of floodplain and upland sites have generated a variety of cultural, temporal, functional and environmental data which have been used to reconstruct the life-styles of Falls Area prehistoric populations. Using radiocarbon dates and artifact sequences from deeply stratified floodplain and rockshelter sites, these data have been ordered chronologically to reconstruct local prehistory. What has emerged is a picture of a constantly changing natural world and attendant cultural responses. The data suggest cultural developments in the Falls Area, and the greater Ohio Valley in general, occurred at a relatively slow, steady rate throughout the Archaic period. Existing models view the Archaic as a period characterized by increasing sedentism through as the development of more efficient subsistence practices resulted in a shift from high residential mobility in the early Holocene to more logistically organized foraging strategies in middle to late Holocene times. Most models to date suggest that the impetus for this trend is environmental change. In particular, the drywarm Hypsithermal or Atlantic climatic episode, which dates from about 7000 to 5000 B.P., and concomitant changes in vegetation are frequently cited as the factor which "forced" Midwest hunter-gatherers out of the uplands and into major river valleys (Brown 1986:323-324; Carmichael More recent studies in southwestern 1977). Indiana settlement-subsistence suggest the

changes which occurred during the Middle Archaic cannot be adequately explained by such simple cause and effect models (Stafford 1991). Although a considerable wealth of knowledge about the Archaic period has been accumulated over the years, many important questions regarding changes and developments in Archaic adaptive strategies, technological systems, and social structures remain to be more fully addressed.

The Early Archaic Period

Based primarily on transitional lithic forms archaeologists have reached general agreement that regional Early Archaic populations in the Midwest and Southeast developed from Late Paleo-Indian expressions (Funk 1978:19). In the greater Ohio Valley temporal limits of 9950 to 7950 B.P. are widely used for this subperiod (cf. Jefferies 1990:150-151; Granger 1988:153). By the Early Archaic many of the harsh conditions associated with the terminal Pleistocene had been ameliorated and the large megafauna species exploited by earlier Paleo-Indian populations had become extinct. Deciduous forests established themselves across the landscape and rivers which previously served as sluiceways for glacial meltwaters dwindled in size, exposing broad alluvial valleys which were conducive to settlement and served as potential travel avenues for human and animal populations. As noted by Muller (1986:56) "...many of the features of the Early Archaic, though poorly understood, reflect the beginning of the long period "specialization" to Eastern Woodland local environments."

In the Falls Area Early Archaic occupations are recognized by a variety of notched point types which are typically well made and fashioned from high quality cherts. Early Archaic points were highly curated, as many specimens retain evidence of a high degree of blade resharpening and rejuvenation. Within the Falls Area point clusters typical of the period consist of Thebes, Kirk, Rice Lobed, LeCroy, and Stanley. The Thebes Cluster incorporates the Thebes, St. Charles, Lost Lake, and Calf Creek point types (Justice 1987:54-60). Each of these types occurs in the general Falls Area, though the Calf Creek type is at its northeastern extension. Klippel (1971) reported

dates of 9530 and 9340 B.P. for Thebes points at Graham Cave, and more recently Morrow (1989) reported four dates spanning the period from 9510 to 8900 B.P. at the Twin Ditch site in the lower Illinois Valley. Radiometric dates for Thebes sites or components in the Falls Area are not available. However, recent work by Indiana State University at the Simpson site (12HR403) identified a potential buried Thebes occupation in Harrison County, Indiana (Stafford and Cantin 1992). Radiocarbon samples have yet to be recovered, though future excavations are planned.

Included in the Kirk Corner Notched and Kirk Stemmed clusters are the Kirk Corner Notched, Stilwell, Palmer Corner Notched, Charleston Corner Notched, Pine Tree Corner Notched, Decatur, Kirk Stemmed, and Kirk Serrated point types (Justice 1987:71-85). Kirk cluster points are typically less massive than those of the Thebes cluster and blades are infrequently beveled. Available radiocarbon dates for Kirk cluster components in the eastern U.S. are in the same range as those reported for Thebes sites. Small variety Kirk points dated to 9490 to 8440 B.P. were recovered from the lower levels at Longworth-Gick in Jefferson County, Kentucky, while an overlying level produced larger Kirk specimens also dated to 8440 B.P. Large variety Kirk points were dated at the St. Albans site in West Virginia to 8850 to 8800 B.P. (Broyles 1971). Kirk Stemmed and Kirk Serrated points are believed to date within the 8850 to 7950 B.P. range (Justice 1987:84).

The Rice Lobed cluster includes Rice Lobed. MacCorkle Stemmed, and St. Albans Side Notched points (Justice 1987:85-91). Each is a basely notched or bifurcated stem type which has geographic distribution within the general project area (though Rice Lobed is at its northeasternmost extension within the Ohio Valley). The related LeCroy Cluster consists of the LeCroy Bifurcated Stem, Lake Erie Bifurcated Base, Kanawha Stemmed, and Fox Valley Truncated Barb point types (Justice 1987:91-97). At Longworth-Gick LeCroy and Kanawha points were recovered from a stratigraphic position above the Kirk horizons dated to 8420 B.P. Kanawha, McCorkle, LeCroy and other unclassified bifurcate base points were recovered from buried alluvial contexts at 12CL106 (and a few examples from 12CL109) during mitigation of the Clark Maritime

Archaeological District in Clark County, Indiana (Sieber and Ottesen 1985).

Stanley Stemmed points have prominent occurrence in portions of the mid-south, southeast, and eastern Atlantic states (Coe 1964; Justice 1987:97-99). This point type is not well documented in the Falls Area, though specimens have been reported in both Kentucky and Indiana. Test excavations at the Glasgow site (46KA229) in Kanawha County, West Virginia, identified what appeared to be a sealed Stanley component (Niquette et al. 1991:27-56). Corrected radiocarbon dates clustered between 8450 to 8150 B.P., indicating a relatively late Early Archaic placement. Corrected dates for the Icehouse Bottom site in Tennessee, Neville site in New Hampshire, Habron site in Virginia, Russel Cave in Alabama, and Hansford site in West Virginia (1987:97-98), were similar to those reported for Glasgow, with only a single date from IceHouse Bottom falling in the pre-7950 B.P. range (Niquette et al. 1991:51). On the basis of these early dates the Stanley complex is placed in the Early Archaic, rather than its more traditional early Middle Archaic position.

Archaeological data collected from surface surveys and excavations throughout the Midwest indicate that the formation of most Early Archaic sites resulted from short-term occupations by small, highly mobile groups (bands). Sites dating to this period are characteristically small in size and produce limited numbers of functionally restricted artifacts. Chert tools associated with the procurement and processing of fauna are most common, though collection of wild plant resources was undoubtedly important to the subsistence base. Generally lacking is evidence of midden development, pit features, human and dog interments, groundstone tools/implements used to process plant foods, and other evidence of longterm and/or intensive occupation; however, thermal features (burned surfaces), charcoal filled pits, and some rock concentrations have been identified at deeply buried sites in the general project area (Collins 1979; DiBlasi 1981; Smith 1986). Using a large-scale survey data set from the dissected, forested uplands in southwestern Indiana, Stafford (1991) concluded that Early Archaic, and possibly early Middle Archaic groups, utilized a mobility strategy dominated by fine-grain patch to patch movement through

multiple drainage basins by procuring resources on an encounter basis as associated with foragers. In this system patch travel costs are minimized and within patch residence time is limited, resulting in high mobility as reflected in frequent residential moves. Patterns of chert procurement for the area suggest residential moves were made over large home ranges relative to the later Archaic periods. Cantin (1993) recently conducted a technological and raw material procurement analysis of Thebes and Kirk cluster points from southwestern Indiana, in an effort to document potential intra-period variability of Early Archaic mobility strategies and home range sizes. The data base consisted of 112 Thebes cluster and 187 Kirk cluster points recovered by the survey of some 22,000 acres in a 17 county area. Resulting data, though subject to differing interpretations, suggest that both Thebes and Kirk groups consisted of small, highly mobile bands. Nevertheless, the movements of the Kirk groups appear to have been confined to more restricted areas or home ranges, suggesting that a "settling in" process was underway. More analysis is needed, but the data are useful for addressing intra-period variability in favor of the generalized Early Archaic "profiles" which have resulted from most studies to date.

In the Falls Area of Kentucky some 60 Early Archaic sites/components have been documented (Jefferies 1990:185). Perhaps the best known of these sites is Longworth-Gick (15JF243), located on a low alluvial floodplain ridge down river from Louisville (Collins 1979). Early Archaic materials were identified in a number of zones at this deeply stratified site excavated by the University of Kentucky in 1975. In situ Early Archaic deposits have also been identified at Ashworth Shelter (15BU236) on Floyds Fork, which serves as the type site for the Early Archaic Ashworth phase (DiBlasi 1981; Granger et al. 1992:28, 30). In the lower levels of the Ashworth site DiBlasi (1981) reported a horizon identified by what were termed Ashworth points (Kirk-like). Two features and a human burial were reported as being associated with this horizon. deposits are reported for the Durrett Cave habitation site (15JF201) and the McNeeley Lake site (15JF200) (Granger 1988). Ashworth Phase materials from the KYANG (Kentucky Air National Guard Site) site have not been analyzed to date (Granger et al. 1992:30). Excavations at the Clark Maritime Center in Clark County, Indiana, identified a wide variety of Early Archaic points types in buried alluvial deposits at sites 12CL106 and 12CL109 (Sieber and Ottesen 1985). In Harrison County, Indiana, Smith (1986) conducted investigations at the Swan's Landing site, a Kirk workshop with multiple occupational zones. Unfortunately absolute dates for the site appear to have been contaminated by coal. Also in Harrison County Stafford and Cantin (1992) conducted Phase II tests at the Simpson site (12HR403) and identified a possible buried Thebes component in the lowermost levels. Site 12HR87, now destroyed by the lateral migration of the Ohio, is reported to have had an Early Archaic bifurcate base component.

Early Archaic Additional sites and components have been identified in a variety of buried contexts in the Midwest and Southeast. In West Virginia Broyles (1971) reported on a stratified Early Archaic sequence at the St. Albans site, while other stratified sequences with Early Archaic components were identified at Modoc (Ahler 1993; Fowler 1959; Styles et al. 1983) and Koster (Brown and Vierra 1983) in southern Illinois. In Tennessee Chapman (1975, 1976, 1977) reported on the bifurcate base tradition components of the Rose Island site, while Coe (1964) discussed the results of his investigations at Early Archaic sites in the piedmont region of North Carolina.

The Middle Archaic Period

Following Jefferies (1990:150-151) and Granger (1992:31) temporal limits of 7950 to 4950 B.P. are used to define the Falls Area Middle Archaic. This departs from the 5950 B.P. date traditionally used bv manv archaeologists to define the Middle/Late Archaic transition (cf., Jefferies 1990:150; Muller 1986:57). According to Jefferies (1990:186) less than 60 Middle Archaic sites have been recorded for the Salt River Management Area, and the sites or components which are dated cluster within the latter portion of the period. This in part, is likely a reflection of a long history of inconsistent classification. Few dates from approximately 8000 to 6000 B.P. are available.

By Middle Archaic times environmental conditions in the Falls Area were essentially

modern, as remnants of Pleistocene vegetation had disappeared (Jefferies 1990:151). inventories (and presumably populations) became increasingly regionalized and new artifact classes and technologies were developed. A "settling in" process was well underway in which localized groups developed more efficient adaptive strategies in order to exploit the wide range of plant and animal resources available (Caldwell's Primary Forest Efficiency). For the first time groundstone artifacts manufactured through a pecking-grinding-polishing technology occur with Included are wood working regularity. implements such as adzes and axes, as well as atlatl weights or bannerstones used in hunting and pendants used for personal adornment. Other formal and informal groundstone tools such as manos, mortars and pestles, and nutting stones were used in the processing of nuts and other plant foods (and possible the smashing of bone prior to boiling). During the latter part of the Middle Archaic relatively large quantities of firecracked rock occur at some sites, suggesting the intensive processing of seasonally available plant resources.

When preservation is adequate bone tools and debris occur in feature and midden contexts. Tools include awls, antler projectile points, fish hooks, scrapers, and gouges used for a variety of extractive and processing tasks. Bone pins, some of which are engraved with geometric motifs, have been reported for sites in the region, but appear to be more common in the lower reaches of the Ohio Valley. Relatively large sites with midden stains, large numbers of pit features, diversified artifact assemblages which include some ornaments of exotic material, and human and dog interments occur in upland and valley settings by late Middle Archaic times. Sites of this nature, which are generally classified as "base-camps" are commonly interpreted as multi-seasonal seasonal and/or residences occupied by relatively large groups to exploit locally abundant resources. Such sites are often situated at or near the interface of two or more micro-environments. Regionally important sites with Middle Archaic components include Eva (Lewis and Lewis 1961), North Carolina Piedmont sites (Coe 1964), Modoc Rockshelter (Fowler 1959), and Koster (Cook 1976; Brown and Vierra 1983).

Falls Middle Archaic sites often include relatively large, well made side-notched points of the Raddatz Cluster (Justice 1987:67-69). Point types in this cluster commonly reported for sites in the greater Falls Area include Big Sandy II, Brannon Side-Notched, Faulker Side-Notched, and Godar Side-Notched. The distribution of Raddatz Cluster points is primarily to the west/northwest of the Falls Area in portions of the lower Ohio, Illinois, and upper Mississippi vallevs. At many of the larger late Middle Archaic midden sites in the Ohio Valley Raddatz Cluster points co-occur with smaller side-notched forms of the Matanzas Cluster (Justice 1987:119-124). The latter cluster consists of the Matanzas Side-Notched, Brewerton Eared-Notched, and Salt River Side-Notched point types. Matanzas cluster points are typically placed within the Late Archaic, but they may well have first appeared during late Middle Archaic times (Anslinger 1988; Cantin and Anslinger 1987; Hemmings 1977, 1985; Jefferies 1988:151-152; Wilkins 1978; U.S. Army Corps of Engineers 1980).

The Old Clarksville Phase was originally defined by Granger (1988:153-203) for the Falls Area Late Archaic, but the placement has since been revised to the late Middle Archaic (Granger et al. 1992). Principal components include Old Clarksville (12CL1), Hornung (15JF60), KYANG (15JF267), and McNeeley Lake (15JF200). Recurrent attributes include the placement of tightly flexed interments in small, oval pits within settlements or nearby middens. On occasion ceremonial grave goods accompany burials, with items such as bracelets, necklaces, pins, and beads, some of which are fashioned from "exotic" materials being present. Available data indicate that females and infants are most often accompanied by such inclusions. The intentional interment of dogs also occurs. Side-notched points, unifacial end-scrapers, drills, and a variety of bone tools (some engraved) also occur with regularity. Middle Archaic deposits identified in southwestern Jefferson County at the Villier, Spadie, and Rosenberger sites yielded limited data (Collins 1979; Pollack 1990:186). It is evident, however, that by the late Middle Archaic sites with relatively thick, well developed midden deposits, numerous pit features, large and functionally diverse artifacts assemblages of chert, groundstone, and bone, and human and dog burials occurred throughout the middle and lower

reaches of the Ohio Valley. The Ferry Landing, Miller, and Hoke sites in Harrison County and the Reid site (12FL1) in Floyd County, Indiana, produced similar components (Janzen 1972, 1977).

In the lower Ohio Valley the Middle Archaic is not well documented, though a number of late Middle Archaic sites have been investigated. The best known of these is the Black Earth site in southern Illinois which was excavated during the Carrier Mills Archaeological Project (Jefferies and Butler, ed. 1982; Jefferies and Lynch 1983). The late Middle Archaic occupation, which dated to approximately 5950 to 4950 B.P., characterized by a heavy dark midden, numerous pit features, Godar/Big Sandy II and Matanzas side-notched points, and an extensive bone tool industry which included engraved bone pins. When blades were broken many of the points were reworked into "hafted" scrapers. notched points accounted for 86% of the points from late Middle Archaic contexts, with stemmed Karnak points being of relatively minor importance. The assemblage was noted to share considerable stylistic similarity to those of the Helton Phase (Cook 1976) in the lower Illinois Valley and the French Lick Phase (Munson and Cook 1980) of southern Indiana.

In southern Indiana a number of sites in the Wabash, White, Ohio, and Patoka watersheds were used by Munson and Cook (1980) to define the French Lick phase. In their dimensional description the authors placed French Lick in the early Late Archaic, within the range of 4950 to 3450 B.P. Using a point data set from the Bluegrass site (12W162) in Warrick County, and a number of surrounding sites in southwestern Indiana, Cantin and Anslinger (1986) suggested that the French Lick Phase actually incorporated lithic elements of both the late Middle and Late Archaic sub-periods, and that refinement of the phase sequence for the area would be possible through the examination of small, short-term camps, rather than the larger midden sites which contained temporally mixed deposits resulting from long periods of re-occupation. Bluegrass site, excavated by Indiana State University in the 1980's, produced a series of radiocarbon dates which clustered between 5500 to 5000 B.P., although one outlier date of 6200 B.P. was also obtained from a lower midden zone

(Anslinger 1988). Lithic and bone artifacts from the site were similar to those reported for Black Earth, Koster's Helton phase component in southern Illinois, the McCain site in southern Indiana (Miller 1941), as well as other sites in the region. A sample of 186 points from the Bluegrass site consisted of 119 (64%) sidenotched and 67 (36%) stemmed forms. The sidenotched specimens where primarily of the Matanzas cluster, though nearly 13% were classified as Godar/Big Sandy II. The stemmed points were primarily in the Karnak/Oak Grove cluster. Some burials from the site produced caches with stemmed points similar to those reported for Green River Archaic in Kentucky. Included were antler atlatl hooks and handles, bar atlatl weights, bifaces and unifaces, antler projectile points, awls, pins, paired ground hog mandibles, and a variety of other items including an occasional mussel shell and a single turtle shell rattle. The composition of the assemblage and the clustered dates suggest that by 5000 B.P. sidenotched points were being replaced by stemmed forms in the area; however, the differences extend beyond simple morphology. The side-notched and stemmed points from the Bluegrass site were manufactured through strikingly different reduction technologies, and the chert usage patterns are also distinct, with the stemmed forms being fashioned from high quality blue-gray cherts of the Wyandotte series and the sidenotched forms from a wide array of lesser quality cherts including fossiliferous varieties.

Data collected from the Falls Area down river into southern Illinois and western Kentucky show a similar pattern in which side-notched point forms are replaced by stemmed types. Whether this transition was roughly coeval throughout the lower Ohio Valley, or whether there were significant lag periods in some watersheds is not well documented at this time. Unfortunately, many of the sites examined to date contain mixed assemblages which are not particularly amenable to resolving this problem. As such, it would be useful to examine difference in the relative frequencies of side-notched and stemmed points at stratified and/or single component sites which are firmly dated. To do so could potentially provide watershed specific temporal data for the sidenotched to stemmed point transition, which in turn could be used in combination with a variety of data to determine if there were concomitant changes in settlement strategies, subsistence practices, technological systems, and social organization.

Also of interest is a study conducted by Stafford (1991) regarding late Middle Archaic settlement within the Wabash Lowland physiographic province of southwestern Indiana. For this period of time (based on the presence of side-notched points at sites) he identified a fundamentally different strategy than noted for the Early Archaic. The structure of extra-valley use changed to a coarse-grained one, where a valley base-camp was used to stage resource procurement episodes of upland and near-river patches for storage at the base-camps (i.e., logistical strategy with high-bulk processing). In this system round trip travel costs and added processing costs reduce the profitability of distant resource patches in the upper reaches of drainage basins. More emphasis is therefore placed on exploiting nearby patches in closer proximity to the bases, although patches once visited in the Early Archaic are not totally ignored. A net increase in travel costs and added processing time results in longer patch residence time and reduced mobility.

The Late Archaic Period

Late Archaic manifestations of the Falls Area share considerable similarity with contemporaneous culture expressions throughout the greater Ohio Valley, though the closest affinities appear to be with sites in the lower reaches of the Valley. Falls Area Late Archaic is dated from approximately 4950 to 2950 B.P., but dates extending to about 2750 B.P. would not be The Late Archaic represents a unexpected. continuation of the late Middle Archaic way-oflife, though artifact assemblages and adaptive strategies show an increase in regional variability and specialization. Also, in some areas such as the Green River, there is evidence for the further development of long-distance exchange systems. By the Late Archaic modern vegetation communities had become established. Within the region Late Archaic sites occur at higher frequencies than do those of the preceding Archaic sub-periods, and a greater range of site types have been documented (Jefferies 1988; Granger et al.1992:32). Although the Falls Area has a relatively long history of archaeological

investigations, it has only been in recent times that discrete cultural-temporal manifestations (phases) have been defined (Granger 1988).

In Kentucky, the most extensive research on the Late Archaic has been conducted in the Green River region. Much of this work was conducted in the 1930's and 1940's by WPA work crews under the direction of William S. Webb and his colleagues. Large numbers of sites in the region, including shell middens or mounds such as Indian Knoll (Webb 1946); Carlston Annis (Webb 1950), Read (Webb 1950), and Chiggerville (Webb and Haag 1939), were examined. Rolingson (1967) conducted the first large-scale reexamination of the Green River shell mound materials. Primarily using point types she was able to document a long history of occupation at the sites which extended from the Paleo-Indian Period to the late prehistoric times. The sites were interpreted as being formed through the gradual accumulation of debris left at the sites during repeated, short-term occupations operating within a central-based wandering settlement-subsistence system. It is commonly noted that shellfish were important to the subsistence economy of Green River Late Archaic populations, though Claassen (1992) has suggested that shell mounds functioned as mortuary facilities rather than residence locations. Shell midden sites with assemblages similar to those from the Green River region, occur in southern Indiana and areas of northern Kentucky, though few such sites are reported up river from the Falls.

For southern Indiana Munson and Cook (1980) defined by French Lick phase of the Late Archaic. Temporal placement was established at approximately 4950 to 2450 B.P. Diagnostic elements of the phase included the M-B-K-S point series (Matanzas, Big Sandy II, Karnak, and straight to expanding stemmed points). Engraved bone pins similar to those recovered from the Helton Phase occupation at Koster and the Black Earth site in southern Illinois, have been identified at a number of southern Indiana sites which produce M-B-K-S points (e.g. McCain, Turpin, Crib Mound, Bluegrass). The Salt River Side Notched point, which appears be a local Matanzas variant confined to the Falls Area, does not occur at French Lick phase sites. Cheryl Munson (1980:678-680) proposed a settlement-subsistence model for the French Lick phase which was

similar to models developed by Winters (1969) for Riverton Culture and by Bowen (1977) for Late Archaic in the western Tennessee River Valley. Hypothesized settlement categories consisted of 1) summer shell middens, 2) summer fishing camps, 3) fall base camps, 4) spring-summer unknown camps, 5) fall-winter hunting camps, 6) fall-winter rock-shelter camps, and 7) winter habitations which were potentially the same as summer shell middens. The model is similar to other developed for Midwest Archaic manifestations in that it is based on a series of site classes differentiated by seasonal, task, and zonal resource utilization.

The Lone Hill phase of the Falls Area was defined by Granger (1986, 1988) following years of research in the region. **Important** sites/components include Lone Hill (15JF10). KYANG II, Minors Lane (15JF36), Spadie (15JF14), Villers (15JF110), and Rosenberger (15JF18.). The Lone Hill phase was initially placed in the Terminal Archaic sub-period, though it has more recently been assigned to the Late Archaic (Granger 1992). Stemmed points are diagnostic of the Lone Hill phase. Typically, the points are fashioned from high quality St. Genevieve chert (Galconda and Wyandotte) and are manufactured through a reduction sequence which incorporates relatively large bifacial preforms. This technology is distinct from that used in the manufacture of the side-notched types of the Old Clarksville Phase. This is a pattern similar to that noted at the Bluegrass site in southern Indiana. Lone Hill Phase sites often include large number of burials, many of which contain grave goods including items of exotic material. Scrapers, drills, axes, atlatl weights and hooks, hammerstones, anvils, and ornaments are also widely reported.

In the Falls Area Janzen (1977) developed a settlement-subsistence model for the Late Archaic based on both Indiana and Kentucky data. Janzen's model differs from those proposed by Winters (1969), Munson (1980) and others, in that he suggested on the basis of resource potential that the Falls Area Late Archaic utilized a semi-sedentary with wandering system (hub and spoke model). As such, his model did not incorporate seasonally shifting bases. Janzen noted that "central base camps" were located at or near areas where two or more micro-environmental zones

came together. From these bases groups could exploit the wide range of resources available within the "unique ecological zone" at the Falls, through the establishment of small support sites occupied by task-specific groups. However, according to Granger (1988) Janzen's model is flawed. He states:

...selection of a cultural entity (phase[s]) whose full settlement pattern, contextual nature of activities, activity areas or settlement types, and system of functional associations was unknown, required as yet undeveloped baseline data. His model fails because of the lack of this information to give it precision predictability. Janzen's (1977) approach was viable but premature (Granger 1988: 165).

A later Archaic expression is represented by Riverton-like points in the Merom-Trimble series. In the Falls Area Riverton style points have been reported in small numbers from several sites. However, large intensively occupied sites have not been identified. In southwestern Ohio Vickery (1976, 1980) used Riverton style points in his definition of the Maple Creek Phase, though he also noted that McWhinney Heavy Stemmed points were common (Vickery 1980:28). Data from 12SW99 in Switzerland County, Indiana, however suggest that the two types were produced by discrete groups, though they may overlap temporally. Late Archaic Merom-Trimble projectile points were recovered at a higher percentage at the Villier site than at the Rosenberger or Spadie sites in Jefferson County. This may suggest a cultural affinity with the Riverton culture and the Maple Creek phase (Jefferies 1990; Robinson and Smith 1979). A temporal span from approximately 3550 to 2750 B.P. has been established for Riverton Culture in Indiana and Illinois (Anslinger 1986:17-18). The Riverton lithic system is based on the expedient acquisition and reduction of chipped-stone tools. Because of the lack of investment in their production, points and other tools show little or no evidence of curation. Also, oval house structures with single post construction were identified at the Wint site (12B95) in Bartholomew County, southeastern Indiana (ibid. 1986:104-111).

The settlement-subsistence model developed by Winters (1969) for Riverton Culture in the Wabash Valley has greatly influenced the development of subsequent models in the Midwest and Mid-south. Based on a variety of criteria including site locations relative to resource zones, seasonality of fauna, and relative ratios of functional (fabricating, processing, domestic, weapons) artifact classes. The model incorporates a variety of seasonally shifting site types composed of major bases and smaller, more specialized ancillary camps. To date the model has not been seriously tested, though potential Riverton hunting and nut processing sites have been investigated (Anslinger 1986; Pace 1980). Although the Riverton model has been widely accepted, the data sets used by Winters were not without problems (cf., Fitting 1973:368-369). Using available data from Illinois and Indiana it would be fruitful to test the Riverton model, with modern geomorphic methods being used to document more precisely the stratigraphic record and contextual nature of cultural inclusions and sediments at the deep midden sites.

The appearance of cultigens in Late Archaic contexts has been interpreted as evidence of early plant domestication and use of these plants as subsistence resources. Evidence of early cultigens has been documented at such sites as Koster in central Illinois (Brown 1977:168), Carlson Annis and Bowles along the Green River in west-central Kentucky (Marquardt and Watson 1976:17), and at Cloudsplitter Rockshelter in eastern Kentucky (Cowan et al. 1981).

Struever and Vickery (1973) have defined two plant complexes domesticated at the close of the Archaic, which continued in use into the Woodland period. One group consisted of nonnative plants such as gourd, squash and corn. The other was a group of native plants such as chenopodium, marsh elder and sunflower. Struever and Vickery (1973) suggested that the native cultigens were cultivated first, and that the non-native, tropical cultigens were introduced later. Recent research in Missouri, Kentucky and Tennessee, however, suggests that squash was under cultivation in the mid-south by the late 3rd millennium B.C. (Adovasio and Johnson 1981:74), and that by the second half of the 2nd millennium B.C., from evidence

Kentucky and Tennessee demonstrates that gourd squash, and sunflower were well established (Adovasio and Johnson 1981:74). This more recent evidence contradicts Streuver and Vickery's scenario (Chomko and Crawford 1978). Watson (n.d.) has outlined two different groups of cultigens, the East Mexican Agricultural Complex and the Eastern United States Agricultural Complex. The latter includes sunflower (Helianthus annus), sumpweed (Iva annua), chenopod (Chenopodium sp.), maygrass (Phalaris sp.), and knotweed (Polygonum sp.). The East Mexican Agricultural complex includes squash (Curcurbita pepo), bottle gourd (Legenaria siceraria) and maize (Zea mays). Watson, like Struever and Vickery (1973), suggests that corn, squash and bottle gourd were domesticated in Mexico and imported into the eastern United States by way of the Gulf of Mexico and then up the Mississippi River and its tributaries. The native cultigens consist of local species whose seeds recovered from archeological contexts are much larger than those which grow in a natural state; hence, cultivation is inferred.

Plant domestication was an important factor in Late Archaic cultural development. Recent research at Cloudsplitter Rockshelter has documented early plant domestication. Desiccated squash rind was found in a Late Archaic deposit at Cloudsplitter associated with a radiocarbon date of 3728 +/-80 B.P. (1778 +/-80 B.C.)(UCLA 2313-K)(Cowan et al. 1981:71). Seeds of the Eastern Agricultural complex (sunflower, sumpweed, maygrass and erect knotweed) are sparse in the Late Archaic levels in the site, but after 3000 B.P. (1050 B.C.), all members of the Eastern Agricultural complex underwent a sudden and dramatic increase in the rate at which they were being deposited in the site, perhaps indicative of a wholesale introduction of the complex into the region at this time. The Late Archaic and Early Woodland inhabitants of Cloudsplitter seem to have followed a similar trajectory in cultivated plant usage experienced in several other river drainages in the Eastern United States (Cowan et al. 1981:71).

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