THE ARCHAEOLOGY OF KENTUCKY: AN UPDATE

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Edited
By
David Pollack

With Contributions
By

Darlene Applegate
Alexandra Bybee
A. Gwynn Henderson
Richard W. Jefferies
Kim A. McBride
W. Stephen McBride
Greg Maggard
Philip Mink
David Pollack
Kary Stackelbeck
M. Jay Stottman

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CHAPTER 3: PALEOINDIAN PERIOD[1]

By
Greg J. Maggard and Kary L. Stackelbeck
Kentucky Archaeological Survey
Lexington, Kentucky

INTRODUCTION

Since the publication of the Tankersley's (1990b) overview of Paleoindian archaeology in Kentucky, relatively few new Late Pleistocene sites have been documented within the state. During the past 17 years, however, there have been significant changes in how archaeologists conceptualize, model, and understand the earliest inhabitants of North America, and research undertaken in Kentucky has contributed to this paradigm shift. Some of these developments include: 1) recognition that the colonization of the Americas occurred earlier than previously considered; 2) documentation of a wider range of cultural diversity across North America during the Late Pleistocene; and 3) development of models that emphasize the complex processes associated with the colonization and subsequent regionalization of new landscapes. These factual and conceptual developments have direct implications for our understanding of Paleoindian lifeways in Kentucky.

RETHINKING COLONIZATION

Until the late 1990s, the view of Late Pleistocene hunter-gatherers in the Americas was largely dominated by the "Clovis-first" paradigm. The theoretical perspective that lay at the heart of this hypothesis held that the New World was peopled by hunter-gatherers migrating from Northeast Asia across the Bering Land Bridge around 11,500 years ago (Haynes 1964, 1966; Kelly 2003; Martin 1973, 1984). The Clovis culture was thought to represent a specialized hunting economy based on the exploitation of large terrestrial mammals and megafauna (Haynes 1966; Martin 1967, 1973; Mossiman and Martin 1975). Upon entering the New World, Clovis peoples were believed to have rapidly colonized much of continental North America (along a rapidly expanding 'bow-wave' front), followed quickly by large parts of northern and western South America. This rapid colonization is thought to have resulted in a relatively homogeneous Late Pleistocene "founder" culture for the entirety of the New World (Fiedel 2000; Haynes 1980; Kelly and Todd 1988; Lynch 1990, 1983, 1974).

[1] Adapted from Tankersley 1990

Within the past two decades, however, new discoveries have resulted in a rather surprising amount of data that cannot be explained under the Clovis-first hypothesis (Bonnichsen and Schneider 1999; Dillehay 1997, 2000; Grayson and Meltzer 2002; Madsen 2004). These discoveries have seriously challenged the Clovis-first model and force us to reconsider the timing of colonization and the processes that were involved in the initial settlement of the New World. Three key developments are responsible for the challenges leveled at the Clovis-first theory: 1) the discovery of sites in both North and South America, most notably the Monte Verde site in southern Chile, that pre-date the posited entry of Clovis into the New World (Adovasio et al. 1999; Adovasio and Pedler 2004; Bryan et al. 1978; Bryan and Gruhn 2003; Dillehay 1988, 1989, 1997; Goodyear 1999; Lepper and Bonnichsen 2004; McAvoy and McAvoy 1997; Meltzer et al. 1997); 2) a failure to identify clear Clovis or Clovis-progenitor sites in the presumed home ranges of Siberia and Alaska (Hamilton and Goebel 1999; Goebel 2004; Goebel et al. 1991); and 3) the recognition of greater than before acknowledged cultural variability, including the existence of several lithic assemblages in North and South America that are technologically distinct from Clovis (Adovasio and Pedler 2004; Borrero 2006; Bryan 1991, 1973; Dillehay 1999, 2000; Goebel et al. 1991; Lavallée 2000; Meltzer 1993, 2002).

Perhaps the most interesting result of these recent developments has been an expanded discussion of the potential timeframe in which colonization was initiated (Bryan 2004; Dillehay 1997; Madsen 2004). It is now clear that humans were in the Americas by at least 11,000 B.C. This is based on the intensively dated occupation of the Monte Verde site, located in southern Chile (Dillehay 1997; 1989; Meltzer et al. 1997), which clearly demonstrates a human presence in the New World that predates the earliest Clovis site (Aubrey site, Texas) by nearly 1,000 years (Ferring 1989, 1990; Fiedel 2006). Assuming the colonization of the New World was initiated through North America—which seems most likely given its proximity to the Asian landmass and recent genetic data (cf., Merriwether 2002; Schurr 2004)—then the early dates from Monte Verde correspondingly imply that humans must have been in North America by at least that time, if not earlier.

Expanding the timeframe for the colonization of the Americas does not mean archaeologists must reject the possibility of a Clovis migration, only the presumed primacy of that migration (Dillehay 2000; Madsen 2004; Meltzer 2004). Clearly, the Clovis phenomenon still represents a rapid and unique spread of a people, technology, and/or economy across a relatively open North American landscape (Anderson 1996; Meltzer 2002). Most researchers now acknowledge that several migrations into the New World may have occurred at different times during the Late Pleistocene (Madsen 2004; Meltzer 2002). These migrations may have involved various cultural groups, who could have originated in different geographic locations, and traveled to North and South America by different methods and routes (Bonnichsen and Turnmire 1999; Bryan 1991; Dixon 1999; Gruhn 1987, 2004; Merriwether 2002; Schurr 2004). The challenge before archaeologists is to better understand the social, economic, and technological relationships that may or may not have existed between various early populations.

The Clovis-first theory held that a homogeneous "founder" culture was responsible for the relatively rapid colonization of North and South America—a situation

that should result in similar archaeological expressions and human physiology throughout the New World during the Late Pleistocene. Biological, linguistic, skeletal, and genetic studies, however, point toward a range of diversity that does not fit well with the notion of a founding lineage or culture (Greenberg et al. 1986; Horai et al. 1993; Horai et al. 1996; Merriwether 2002; Munford et al. 1995; Neves et al. 1996; Nichols 1990, 2002; Schurr 2004; Steele and Powell 1992, 2002; Szathmary 1993; Torroni et al. 1993). Although there is often little direct agreement in the age ranges or number of migrations suggested by these individual studies, when taken as a whole, the picture they paint of colonization is one of a complex process that may have occurred earlier (ca. 15,000-30,000 years ago) than has traditionally been considered and involved multiple, separate migrations (Schurr 2004; Steele and Powell 2002).

At present, however, the archaeological record suggests that the younger end of this age range (ca. 13,000 B.C.) is the most likely. The Monte Verde site places humans in southern South America by at least 10,500 B.C. (Dillehay 1997). If colonization initiated through North America—as the evidence suggests—then even the most rapid rate of movement (see Anderson and Gillam 2000; Surovell 2000) would place the timing of initial entry around 14,000-15,000 years ago, which correlates relatively well with the lower end of the linguistic, genetic, and skeletal estimations.

In addition to the genetic and linguistic diversity that appears to have been present during the Late Pleistocene, it has become increasingly clear that a wide variety of cultural expressions also existed. The Nenana complex of Alaska (Goebel et al. 1991; Hamilton and Goebel 1999; Powers and Hoffecker 1989); the Western Stemmed Tradition of the Great Basin and Columbia Plateau (Ames 1988; Beck and Jones 1997); and maritime-focused coastal California sites (Erlandson 1994; Erlandson and Moss 1996; Jones et al. 2002; Rick et al. 2005) evidence varied economic practices and technological traditions that are distinct from the traditional characterizations of Clovis.

In South America this cultural diversity is even more apparent with widely varying economic and technological traditions across the continent during the Late Pleistocene (Dillehay 2000; Dillehay et al. 1992; Lavallée 2000). Sites, such as Monte Verde in Chile (Dillehay 1997, 1989), Taima-Taima in Venezuela (Ochsenius and Gruhn 1979), Amotape complex sites in northern Peru (Richardson 1983, 1981), coastal sites in southern Peru and northern Chile (Lavallée 2000; Keefer et al. 1998; Sandweiss et al. 1998), Fishtail complex sites of southern and western South America (Briceño 1999; Borrero 1996; Miotti 2003; Miotti and Salemme 1999; Politis 1991), Itaparica Tradition sites in eastern Brazil (Kipnis 1998), and early unifacial sites in Colombia (Correal 1986, 1981), illustrate a range of cultural adaptations and traditions in distinct environments that is inconsistent with the previously held notions of widespread cultural homogeneity.

MODELING COLONIZATION

The recognition of a wider range of early cultural diversity has forced researchers to reevaluate long-standing ideas on how and when the Americas were colonized. The failure of the traditional 'bow-wave' model of rapid migration (e.g., Martin 1973;

Mossiman and Martin 1975) to account for or explain early diversity has fostered a renewed interest in understanding (and modeling) the process of colonization itself. As a result of the renewed interest in colonization, several models have been generated that focus more exclusively on the behavioral and strategic choices humans make in open landscapes (e.g., Anderson 1990; Anderson and Gillam 2000; Beaton 1991; Bettinger and Young 2004; Dillehay 1997; Dixon 1999; Kelly and Todd 1988; Meltzer 2002), with relatively less emphasis on the timing of initial entry (although this remains an important question [see Fiedel 1999, 2002, 2006; Madsen 2004]).

One of the important features of several of the newer models is an explicit recognition that variable rates of exploration, expansion, and settlement may have operated conterminously (Anderson and Gillam 2000; Beaton 1991; Dillehay 1997; Dixon 1999). Rather than viewing colonization as an event, these models conceptualize colonization as a process in which exploration and migration may only be the first steps. Generally speaking, *colonization* is defined as the process through which viable human groups enter, explore, and settle a given landscape or region (Beaton 1991; Dillehay 2000; Dixon 1999; Madsen 2004; Meltzer 2002).

This conceptualization is necessarily broad and encompasses a wide range of potential human behaviors. Adapting to new climatic and ecological conditions, transforming technologies to new requirements, and maintaining group viability and social ties are all equally important components of the *process* of colonizing a new landscape (Golledge 1999; Mandryk 1993; Meltzer 2002; Rockman 2003). Differential strategies pursued by coterminous colonizing populations (or over time) could produce profound cultural variability in the archaeological record. The possibility of linking that variability to different strategies of colonization shows promise for increasing our understanding of how and when humans settled the New World.

Conceptualizing colonization as a process allows researchers to begin to integrate seemingly disparate regional data and patterns into larger interpretive frameworks (on supra-regional scales). The strength of this approach is that archaeologists no longer assume that colonization was the same everywhere (Beaton 1991; Dillehay 1997; Meltzer 2002). Rather, it seems likely that different groups probably approached the exploration and settlement of new landscapes with distinct strategies. Identifying and documenting this strategic variability may provide explanations—which have largely eluded archaeologists—for the cultural variability that is known to have existed during the Late Pleistocene period.

Another important feature of some colonization models is the recognition that intensity of settlement in individual landscapes and/or regions varied widely (Anderson 1996; Anderson and Gillam 2000; Bonnichsen and Turnmire 1999; Dillehay 2000). One explanation for disparities in settlement intensity is the process of *regionalization*, which is interrelated with colonization. *Regionalization* can be defined as the process in which colonizing groups and their offspring, within some geographically restricted region, begin to develop more intensive or specialized subsistence practices that are tailored to specific local ecologies (Dixon 1999; Tankersley 1998).

Like colonization, regionalization must be viewed as a process that involves the strategic choices of individual groups that may lead to increased territoriality,

development of formal social networks, changes in mobility and subsistence strategies, economic intensification, and technological changes (Bamforth 1991; Bar-Yosef and Valla 1991; Dillehay 2000; Henry 1985; Stanford 1999; Tankersley 1998). The process of regionalization provides researchers with a significant conceptual tool for understanding the diversity of cultural expressions that develop after the initial colonization of a new landscape. The appearance of the Folsom, Goshen, Agate Basin and Cody complexes of western North America, and the Cumberland, Gainey, Beaver Lake, and Dalton complexes (among others) of eastern/southern North America may be best understood as regional outgrowths of an on-going process that emphasized increasingly intensified knowledge and use of local environments and resources. However, significant deficiencies remain in our understanding of the differences in the social, economic, and technological practices of these early complexes. If archaeologists can gain more insight into the development and organization of these distinct complexes, then they may be able to better understand the relationships between them and the strategies of the early colonizers from which they developed.

In sum, the 1990s and 2000s have seen some remarkable developments in the study of the peopling of the New World. New data (archaeological, linguistic, and genetic), an expanded chronology, and more robust models have shifted our understanding of colonization away from one-dimensional techno-economic explanations toward more comprehensive characterizations of the social, demographic, and behavioral choices that may have been involved in colonization. Although understanding the timing of initial migrations remains important, the growing recognition of a wide range of cultural diversity in the archaeological record has shifted researchers focus toward attempts to explain this diversity. These attempts have led to new conceptualizations of the process of colonization and the specific strategies involved in that process—as well as those that developed after initial colonization.

THE KENTUCKY PALEOINDIAN PERIOD

The Paleoindian period (ca. 9,500-8,000 B.C.) represents the initial documented colonization of all the major physiographic regions within Kentucky. It was recognized early on that differences in densities and distributions of sites, technologies, and subsistence patterns existed between earlier and later Paleoindian manifestations (Mason 1962; Rolingson 1964; Rolingson and Schwartz 1966). However, it has only been within the past two decades that archaeologists have begun to more specifically define these differences and relate them to relatively distinct phases within the broader Paleoindian period.

It is now relatively common across much of North America to refer to three distinct phases within the Paleoindian period: Early, Middle, and Late (Anderson 1996; Goodyear 1999; Stanford 1999; Tankersley 1996). The timeframes represented by each of these phases is somewhat variable and overlapping across different geographical regions. In general though, each temporal phase is believed to represent relatively distinct settlement patterns, technologies, and subsistence practices that were associated

with the processes of colonization and regionalization (Anderson 1996; Anderson and Gillam 2000; Meltzer 2002; Ray 2003; Stanford 1999; Tankersley 1996, 1998). Like the temporal frameworks of these phases, there also exists a substantial amount of overlap in the technological and subsistence patterns and practices between the different phases.

Within Kentucky, archaeological components indicative of the Early, Middle, and Late Paleoindian subperiods have been identified across the state (see Ray 2003; Tankersley 1996). The general characteristics and loose temporal boundaries of each of these three subperiods are discussed below.

EARLY PALEOINDIAN (?-8,000 B.C.)

Pre-Clovis (?-9,500 B.C.)

To date, no pre-Clovis aged sites have been identified in Kentucky. However, since the discovery of the Monte Verde site in Chile (Dillehay 1997, 1989), it has become clear that North America was likely initially settled earlier than archaeologists have traditionally thought (Lepper and Bonnichsen 2004; Madsen 2004). As a result, a growing number of sites have been documented that contain cultural assemblages in depositional contexts that are stratigraphically below Clovis layers. Several of these possible pre-Clovis sites are located in regions close to Kentucky—notably, Cactus Hill in Virginia, Topper in South Carolina, Big Eddy in Missouri, and the Meadowcroft Rockshelter in Pennsylvania (Adovasio et al. 1999; Goodyear 1999; Lopinot et al. 2000; McAvoy and McAvoy 1997).

One of the best examples of pre-Clovis aged cultural materials in the southeastern North America comes from the stratified, multicomponent Cactus Hill site (McAvoy and McAvoy 1997; McAvoy 1997; Wagner and McAvoy 2004). The site is located on the coastal plain of southeastern Virginia and is situated within a paleo-sand dune and contains stratified Clovis, and apparently pre-Clovis artifacts (McAvoy and McAvoy 1997; Wagner and McAvoy 2004). A well-defined Clovis layer containing fluted points, other tools, and hearth features has been radiocarbon dated to ca. 8,900 B.C. (McAvoy 1997). Several clusters of small quartzite flakes, small prismatic blades, blade cores, and retouched flakes were recovered from deposits stratigraphically below the Clovis layer. Two small, basally-thinned bifaces (roughly pentangular forms) also were recovered from below the Clovis layer and appear to be associated with the clusters of small blades and flakes (McAvoy and McAvoy 1997). Locally-available quartzite cobbles appear to have been the focus of lithic reduction activities within the pre-Clovis deposits.

In addition to the flake and blade clusters, a charcoal concentration was identified and yielded a radiocarbon age of 13,120 B.C. (15,070±70 B.P). Soil samples collected from below the Clovis layer and associated with the flake clusters yielded additional dates of 14,720 B.C. (16,670±730 B.P). and 14,990 B.C. (16,940±50 B.P.) (McAvoy and McAvoy 1997; Wagner and McAvoy 2004). McAvoy (1997) suggests that the artifacts from the lower levels of Cactus Hill represent a clear pre-Clovis occupation of the

southeast by at least 13,000 B.C. that emphasized the production of small prismatic blades.

A second example of nearby pre-Clovis aged deposits comes from Meadowcroft Rockshelter, which overlooks a tributary of the upper Ohio River. Adovasio and colleagues (Adovasio et al. 1980, 1990; 1999; Adovasio and Pedler 2004) have identified a deeply stratified and multicomponent sequence of radiocarbon-dated deposits that span the Late Pleistocene and Holocene. An unfluted, lanceolate-shaped projectile point (referred to as a Miller Lanceolate) was recovered from the lower levels (Stratum IIa) of the shelter and is associated with an age of 10,800-9,300 B.C. (based on bracketed dates from stratigraphically above and below the projectile point) (Adovasio et al. 1999). Other lithics associated with the lower strata at Meadowcroft include small prismatic blades apparently struck from prepared cores.

Several well-known critiques (notably Haynes 1980, 1987; Tankersley et al. 1987; Tankersley and Munson 1992) have been raised regarding the possible introduction of particulate and/or soluble contaminants into the lower deposits at Meadowcroft that may have affected radiocarbon determinations. In spite of the fact that the radiocarbon determinations from Meadowcroft do appear to correlate closely with both the cultural and stratigraphic sequences (Adovasio et al. 1999), the site remains controversial.

Although geographically removed from one another, there are broad similarities among some of these sites that may provide hints about what a possible pre-Clovis occupation in Kentucky might look like. Only two of these sites—Cactus Hill and Meadowcroft—have been discussed here, but they (along with the Topper site) share an early emphasis (ca. 14,000-10,000 B.C.) on the production of small prismatic blades and flakes from prepared cores (Adovasio et al. 1999; Adovasio and Pedler 2004; Goodyear 1999; McAvoy and McAvoy 1997). Small unfluted bifaces also have been found, like the pentangular Cactus Hill examples, but appear less frequently than the associated blade tools.

At present, little can be said regarding the technological organization of any pre-Clovis group, let alone subsistence strategies or settlement patterns. It is clear from the above discussions, however, that it is important to excavate levels beyond what are considered to be the basal cultural deposits. Perhaps one of the most important contributions of these sites is that they remind archaeologists to remain both conceptually and methodologically open to the possibility of encountering archaeological deposits and materials that do not fit within traditional timeframes and conceptualizations (Adovasio and Pedler 2004; Dillehay 1997, 2000; Goodyear 1999; Lepper and Bonnichsen 2004; Meltzer 2002).

Clovis (ca. 9,500-8,800 B.C.)

The Clovis culture or complex represents the earliest widely documented occupation in Kentucky and across North America (Anderson 1996; Haynes 2002; Tankersley 1990a). Fluted and finely worked lanceolate projectile points represent the most diagnostic artifact type recovered from Clovis sites, but other lithic, bone, and ivory tool types also are well-known (Boldurian and Cotter 1999; Haynes 2002; Frison 1999; Morrow and Morrow 1999; Tankersley 1996). Although a range of variability in size and

basal shape has been documented for Clovis points (Collins 1999; Haynes 2002; Morrow and Morrow 1999; Ray 2003), which are bifacially flaked, concave-based, lanceolate forms identified by the presence of thinning flakes—or flutes—that extend from the base toward the distal end (Figure 3.1). Flutes may be single or composite, and located on one or both faces of the tool. Most fluted points were manufactured from bifacial preforms, but flake blanks also appear to have been employed (Boldurian and Cotter 1999; Haynes 2002; Sanders 1990).

Clovis points often display resharpening along the distal margins of the blade and were multifunctional (serving both as weapon tips and for use in various cutting/butchering activities) (Boldurian and Cotter 1999; Kay 1996; Ray 2003). The proximal edges were typically ground in preparation of hafting. Clovis points may have been hafted by: 1) tightly binding the tool directly to a bone or ivory foreshaft that was then attached to a spear shaft (Boldurian and Cotter 1999; Frison 1999); or 2) by direct binding to the spear shaft using beveled bone or wood rods to provide counter-pressure that secures the tool in place (Haynes 2002; Lyman et al. 1998).

Aside from the distinctive fluted points, Clovis lithic toolkits also contain large bifaces (sometimes used as cores or tools), blades and polyhedral and conical blade cores, side and end scrapers made on both blades and flakes, and gravers (Boldurian and Cotter 1999; Frison 1999; Haynes 2002; Sanders 1990; Stanford 1999). Unifacial and flake tools, some finely worked, are relatively common in Clovis assemblages (Morrow 1996; Sanders 1990). Clovis blades, in general, are triangular in cross-section with faceted, ground platforms (Collins 1999; Freeman et al. 1996). At the Adams (15Ch90) and Joe Priddy (15Hd583) sites in Kentucky, Clovis blades were often retouched along the side or end to form cutting and scraping tools (Haag 2004; Sanders 1990:52-59). Clovis sites in Kentucky that contain evidence for blade technology tend to be situated adjacent to high quality raw material exposures (Gramly and Yahnig 1991; Haag 2004; Lane et al. 1997; Stackelbeck 1996).

The Clovis toolkit is also known to have included a variety of perishable bone and ivory implements. Bone and ivory foreshafts (beveled on one or both ends) and points have been recovered from a number of sites located across western North America (Frison 1999; Haynes 2002). In eastern North America, however, bone and ivory tools are much less common. Notable exceptions include a large number of modified bone and ivory implements recovered from submerged contexts in Florida (Dunbar and Webb 1996), and two incised bone points with beveled bases from Sheriden Cave in Ohio that were associated with extinct Pleistocene fauna and Clovis lithic tools and debitage (Redmond and Tankersley 2005).

Haynes (2002:110) has noted that no Clovis site contains all of the tool classes that have been identified. Assemblages from Clovis sites typically contain only one or a few individual tool classes, suggesting that individual sites were likely occupied for relatively short periods and that different activities may have been pursued in distinct locations across the landscape. Large sites with high artifact densities and wide varieties of tool classes—indicating more intensive and/or repeated occupations—are relatively rare (Anderson 1996; Stanford 1999). The Adams site in Christian County and the Carson-Conn-Short site, which is situated along Kentucky Lake in Tennessee, are notable

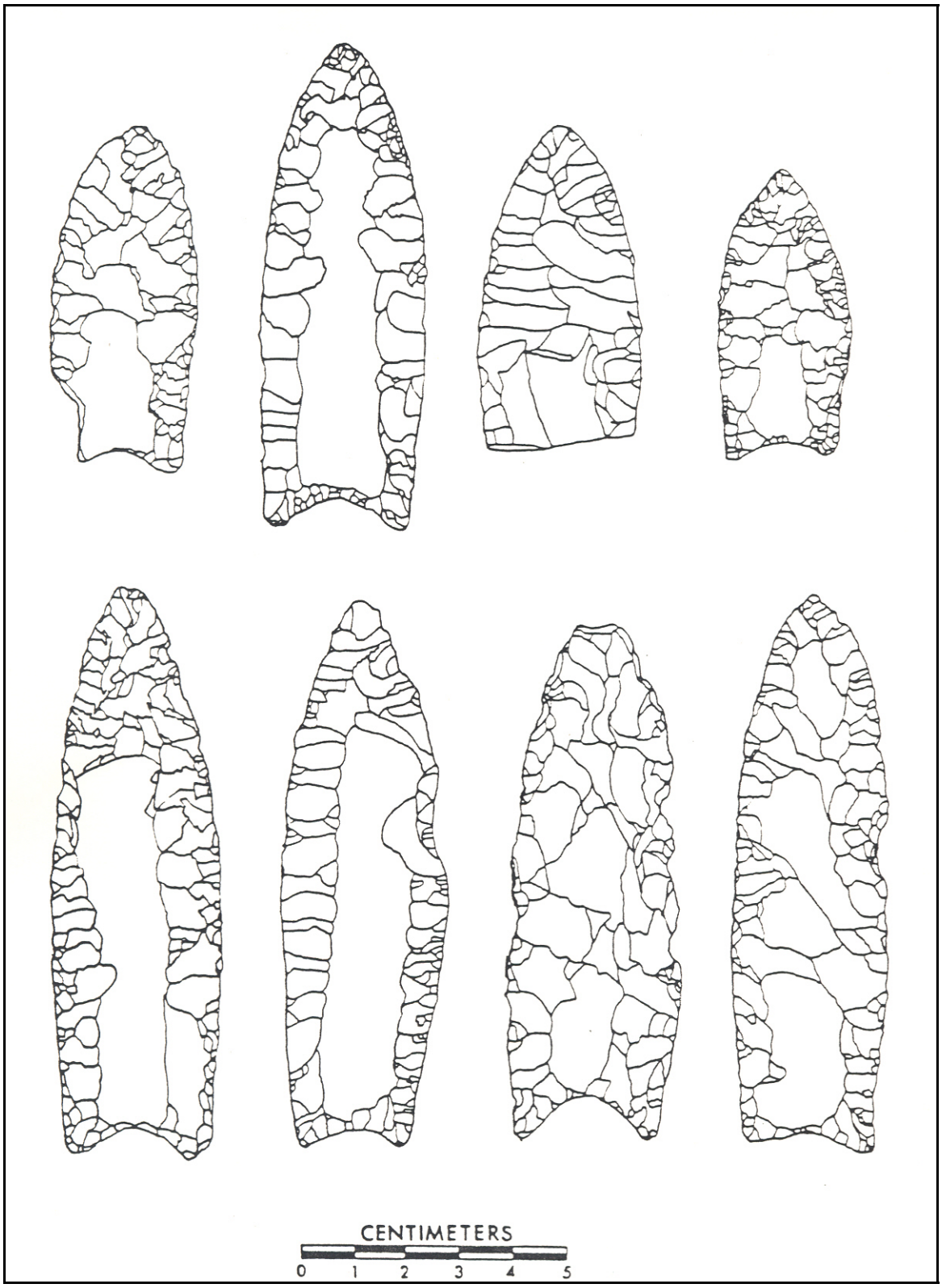

Figure 3.1. Clovis cluster projectile points from Big Bone Lick (15Be18 and 15Be269-272).

examples where high densities of a wide range of tool classes, including blades, have been documented (Broster and Norton 1993, 1996; Sanders 1990).

It is unclear if the few recorded large and/or dense Clovis sites represent intensive quarry/workshop locales, repeated occupations, seasonal rendezvous sites, or some combination of each (Anderson 1996; Freeman et al. 1996; Gramly and Yahnig 1991; Haag 2004). Sanders (1988, 1990) has suggested that the Adams site deposits represent an intensively occupied, short-term base camp/workshop (Figure 3.2). Others (Gramly and Yahnig 1991; Haag 2004; Tankersley 1996) see the high density of deposits at the site as indicative of repeated occupation/use. The Adams site—along with several other quarry/habitation sites identified in the Little River drainage of southwestern Kentucky (e.g., Ezell [15Ch483], Roeder [15Ch482]), and Boyd [15Ch236] [Figure 3.3] sites)—illustrate the difficulty in clarifying the nature of Clovis occupations at these sites due to the fact that intact, subplowzone deposits are rare to nonexistent and only limited excavations have taken place at this sites (Gatus and Marquardt 1984; Gramly and Yahnig 1991; Sanders 1990).

Aside from the relatively few dense quarry/habitation sites that have been identified, most of the Clovis sites in Kentucky—and in the larger Southeast region as a whole—are represented by relatively small, ephemeral occupations. These smaller sites are typically shallow in terms of depth of deposits, contain low numbers of artifacts, and provide evidence for few subsistence or economic activities (Anderson 1996; Gramly and Yahnig 1991; Goodyear 1999; Ray 2003; Tankersley 1990a). Small sites probably represent several different possible functions, including short-term habitations, encounter/temporary use sites, and possible kill/butchering sites, among others. At present, however, we do not have a very good idea of the range of Clovis site types that exist in Kentucky.

Several possible kill/butchering sites have been identified in Kentucky (Adams Mastodon [15Hr14], Big Bone Lick [15Be18, 15Be269-272], and Clay's Ferry Crevice [15Fa163] sites are possibilities), but the Early Paleoindian artifacts recovered from these sites have not been conclusively associated with Pleistocene faunal remains (Haag 2004; Lowthert 1998; Tankersley 1996; Walters 1988). A few cave and rockshelter sites in Kentucky may contain Clovis materials, such as the Enoch Fork Shelter (15Pe50) in Perry County, but none have, as yet, yielded clearly documented diagnostic Early Paleoindian artifacts in context (Bush 1988; Evans 1995; Freeman et al. 1996; Haag 2004; Tankersley 1996). The Enoch Fork Shelter, however, did yield a radiocarbon date of 9010 B.C. (10,960±240 B.P.) that was stratigraphically associated with a retouched blade (Bush 1988:60-61). This date and the associated blade were recovered from deposits stratigraphically below a Late Paleoindian lanceolate point, suggesting that this site may represent an example of Early Paleoindian cave/shelter use in Kentucky. However, it is equally likely that the Enoch Fork deposits represent a Middle Paleoindian occupation (Evans 1995).

Although Clovis sites are found in all regions of the state, it has been suggested that they tend to cluster in specific topographic settings, such as terraces along major stream confluences, around karstic features (e.g., sinkholes and sinkponds), and near outcrops of high quality lithic raw materials (Anderson 1990; Gatus and Maynard 1978; Tankersley 1996). However, Ray's (2003) survey of Paleoindian site locations in Marion

Figure 3.2. A sample of the fluted point assemblage from the Adams site (15Ch90), Christian County, Kentucky.

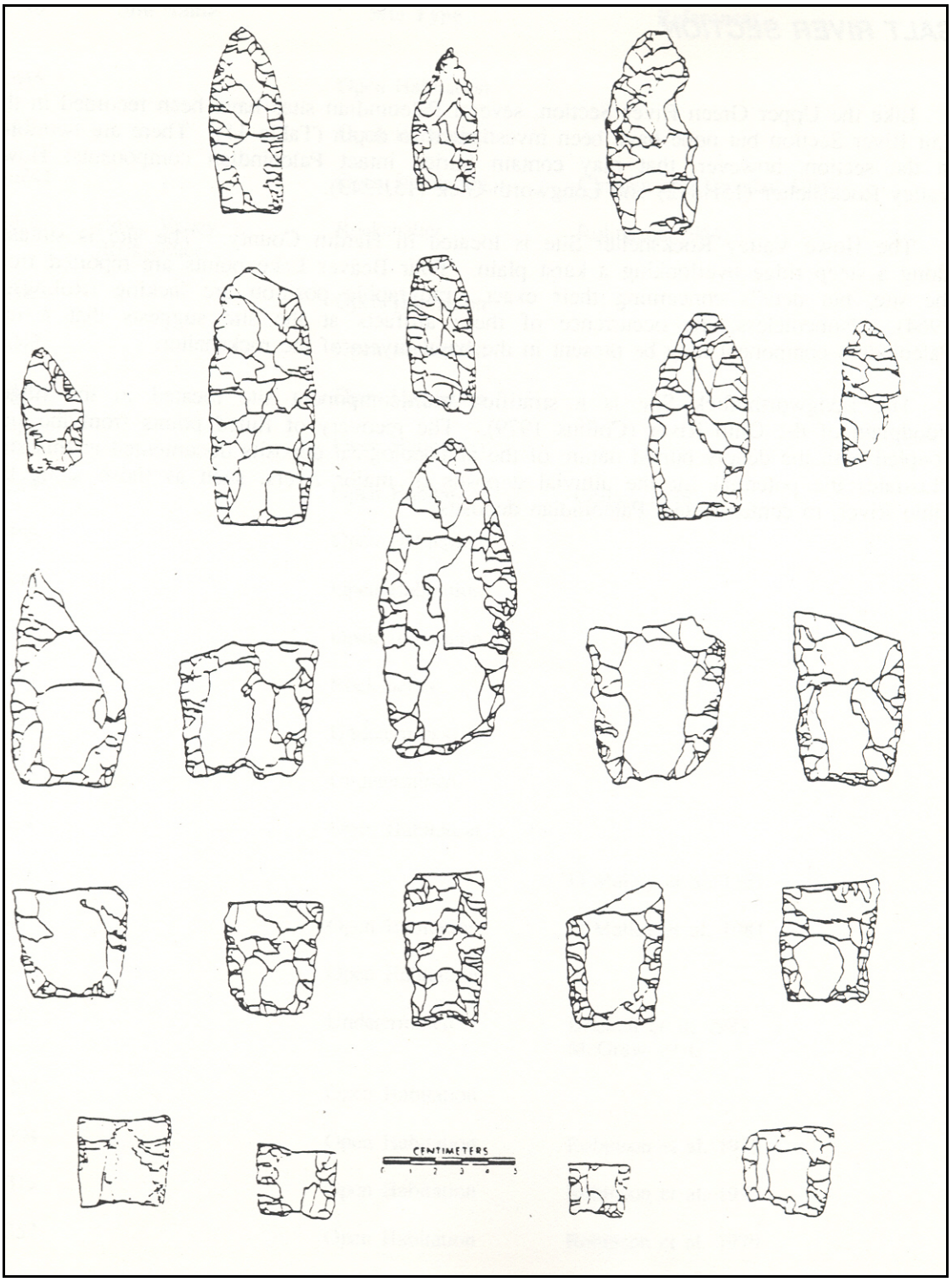

Figure 3.3. A sample of the fluted point assemblage from the Boyd site (15Ch236), Christian County, Kentucky

and Washington counties indicated that upland and headwater locations also were frequently used. Of the 20 Early and Middle Paleoindian sites documented by Ray (2003:26-43), 57.9 percent were situated on ridge summit or divide summit landforms, indicating a much more diverse and widespread pattern of settlement than previously thought. Since Clovis groups are considered to have been highly mobile populations, archaeologists should expect to find their sites in widely varying locations. Widespread settlement on different kinds of landforms along with the presence of distinct types of Clovis sites, however, is suggestive of a level of landscape and resource knowledge that is not consistent with a rapidly moving colonizing population (Dixon 1999; Meltzer 2002).

Anderson (1990:185-196) has suggested that during Clovis times, portions of western Kentucky (specifically the central Ohio and lower Cumberland drainages) were 'staging areas' for the exploration and settlement of other nearby areas of the continent. The dense quarry/habitation sites of the Little River complex in Christian County appear to provide strong support for this idea. The quarry/habitation sites that define this complex, however, bear little resemblance—in terms of density of materials and occupation—with Clovis sites in other regions of Kentucky. In addition, archaeologists do not know for how long the sites associated with this complex were occupied, whether those occupations were contemporaneous or sequential, or what kind of relationship they may have had with sites in neighboring areas. Developing a better understanding of the temporal and economic relationships between these sites and others in Kentucky is necessary to provide more insight into how the process of colonization occurred.

Aside from increasing our understanding of Clovis settlement, researchers also need to expand our knowledge of Early Paleoindian subsistence. Clovis groups in Kentucky have long been characterized primarily as big game hunters (Kelly and Todd 1988; Tankersley 1990b, 1996). However, as noted above, archaeologists currently have no clear kill/butchering sites in Kentucky. There is no doubt that Clovis peoples exploited big game resources—kill/butchery sites in nearby states, such as the Kimmswick site in Missouri and the Coats-Hines site in Tennessee, attest to the exploitation of big game (Breitburg et al. 1996; Graham et al. 1981).

Dincauze (1993) has noted that environmental conditions in eastern North America may have limited the preservation of Pleistocene bones in kill/butchery sites. It has been suggested, however, that the diverse and changing local environments of eastern North America toward the end of the ice age may have fostered more of a generalized foraging strategy that emphasized the exploitation of a wider range of small game and plant resources (Dincauze 1993; Meltzer 1993; Walker and Driskell 2007). Even at the Kimmswick site in Missouri, a diverse range of faunal species were exploited, including small mammals, fish, reptiles, and birds, indicating a varied subsistence base (Graham et al. 1981; Graham and Kay 1988).

Subsistence information from Clovis sites is generally rare. However, research across North America is painting a picture of Clovis subsistence that more closely resembles the broad-spectrum Early and Middle Archaic subsistence practices (see Chapter 4) than it does a big game hunting specialization (Cannon and Meltzer 2004; Collins 2007; Kornfield 2007; Lepper 1999; Meltzer 1993). In Kentucky, the paucity of excavated Clovis sites with intact deposits limits our ability to gather information

regarding Early Paleoindian subsistence practices. However, it is becoming clear that archaeologists should expect to encounter a variety of potential faunal and botanical resources at Clovis sites.

In sum, the Clovis occupation of Kentucky appears to have been dense and widespread. In spite of the number of sites and finds that have been identified, archaeologists still know very little about the timing of Clovis occupation (aside from the one radiocarbon date from Enoch Fork Shelter), the range of different types of Clovis sites, or Clovis subsistence practices. Advances in understanding Clovis settlement and landform use (Ray 2003), technological strategies (Freeman et al. 1996; Gramly and Yahnig 1991; Haag 2004; Ray 2003; Tankersley 1996), and possible colonization strategies (Anderson 1996; Lane and Anderson 2001) suggest that future research will provide much needed additional data.

MIDDLE PALEOINDIAN (CA. 9,000-8,500 B.C.)

The Middle Paleoindian phase is similar in most respects to the preceding Early Paleoindian Clovis subdivision, but is distinguished by technological changes, greater stylistic diversity, and probable increased economic regionalization (Goodyear 1999; Ray 2003; Tankersley 1996). The Middle Paleoindian phase witnessed marked climatic changes that resulted in environmental instability and the apparent extinction of most species of Pleistocene mega-fauna (Anderson et al. 1996; Delcourt and Delcourt 1981; Grayson 1987; McWheeney 2007; Morse et al. 1996). These environmental changes appear to have resulted in a subsistence shift toward an increased reliance on regionally available plant and smaller game resources within a mixed foraging economy (Walker 2007).

A shift toward more locally available resources also is apparent in Middle Paleoindian lithic toolkits. Use of a wider range of raw material resources, including some poorer quality materials, occurred during this phase (Haag 2004; Tankersley 1996). Changes in lithic technology also accompanied the increased use of locally available chert resources. Tankersley (1996:31) states that the blade technology of the Early Paleoindian phase disappeared and was replaced by bipolar reduction. It also has been suggested that a change in fluting technology occurred, resulting in a shift from direct percussion during the Early Paleoindian phase to indirect percussion during Middle Paleoindian times (Morrow 1996; Ray 2003).

Middle Paleoindian projectile points also show increased stylistic diversity with the appearance of Cumberland and Gainey points. Gainey points are lanceolate, fluted points that stylistically resemble Clovis points (Deller 1989; Deller and Ellis 1988; Justice 1987; Morrow 1995; Ray 2003; Simons et al. 1984). Gainey points are typically thinner than Clovis points, have deeper basal concavities, and are often resharpened along the distal end of the blade. Flutes typically extend one-half to three-quarters of the blade length and often overlay discernable guide flutes (Morrow 1996; Morrow and Morrow 1999; Ray 2000, 2003; Simons et al. 1984). Gainey points are also usually ground along

the lateral proximal margins, but do not exhibit extensive basal retouch after fluting (Ray 2003:20).

Cumberland points also are a lanceolate, fluted point (Figure 3.4). However, they are typically longer and narrower than either Clovis or Gainey points. The blade on Cumberland points is typically excurvate, while the lateral proximal edges expand slightly, resulting in flared 'ears' or a 'fishtail-like' appearance to the hafted end of the tool (Justice 1987; Ray 2003; Rolingson 1964; Tankersley 1996). Cumberland points are deeply fluted, with flutes often extending three-quarters to nearly the full length of the blade. Ray (2003:20-21) notes that these types of points were frequently resharpened along the distal end of the blade and that the resharpening flakes often truncate the end of the flute channel. Cumberland points do not exhibit guide flutes, but are often finely retouched along the concave basal margin.

Middle Paleoindian lithic toolkits typically contain a wider range of tool types than their Early Paleoindian predecessors. Limaces, spurred end scrapers, and a wide variety of flake tools become more common in Middle Paleoindian assemblages (Ray 2003; Tankersley 1996) (Figure 3.5). The greater diversity of tool types present in these assemblages is probably related to subsistence activities associated with an increasingly mixed foraging economy and the exploitation of a wider range of local resources.

Like Early Paleoindian Clovis sites, Middle Paleoindian sites are found throughout Kentucky. However, based on the distribution of recorded diagnostic points, it appears that Middle Paleoindian sites may have a somewhat wider distribution than Clovis (Tankersley 1996). Middle Paleoindian sites and components have been well-documented in floodplain/terrace settings in the Purchase Management Area, such as the Henderson site (15Ly27) in Lyon County, and in the Green River Management Area at the Boyd (15Ch236) site in Christian County (Gramly and Yahnig 1991; Rolingson and Schwartz 1966; Tankersley 1996). Sites of this period, however, also have been documented in the Knobs region of the Salt River Management Area, including 15 sites in the Upper Rolling Fork region (Ray 2003), the Red Sand site (15Ht46) in Hart County (Lane and Gordon 1997) and the Danville Tank site (15Bo16) in Boyle County (Boedy and Niquette 1987). Several Middle Paleoindian sites also have been identified in the uplands of Upper Cumberland Management Area, including the Oil Well Branch Road site (15McY412) (Des Jean 1993) and several sites in the Alma Nation site complex in Cumberland County (Lane 1995, 1996b, 1996c; Lane et al. 1995), and in the Big Sandy Management area at the Cowpen Creek site (15Pi96) in Pike County (Baltz 1995).

In spite of the geographically wide distribution of Middle Paleoindian sites and projectile points, archaeologists know relatively little about the nature of these occupations or the activities that occurred at individual sites. That no Middle Paleoindian sites or components have been excavated in Kentucky in the last 20 years limits our ability to understand the transition from Early to Middle Paleoindian adaptations, and the relationships between contemporaneous Middle Paleoindian cultural expressions (e.g., Gainey and Cumberland). No sites in Kentucky have yet been identified that yielded a Middle Paleoindian radiocarbon date in direct association with diagnostic artifacts. However, as noted above, the Enoch Fork Shelter has yielded one radiocarbon date that may fit within the Middle Paleoindian timeframe (9,010 B.C.;10,960±240 B.P.) (Bush 1988; Evans 1995).

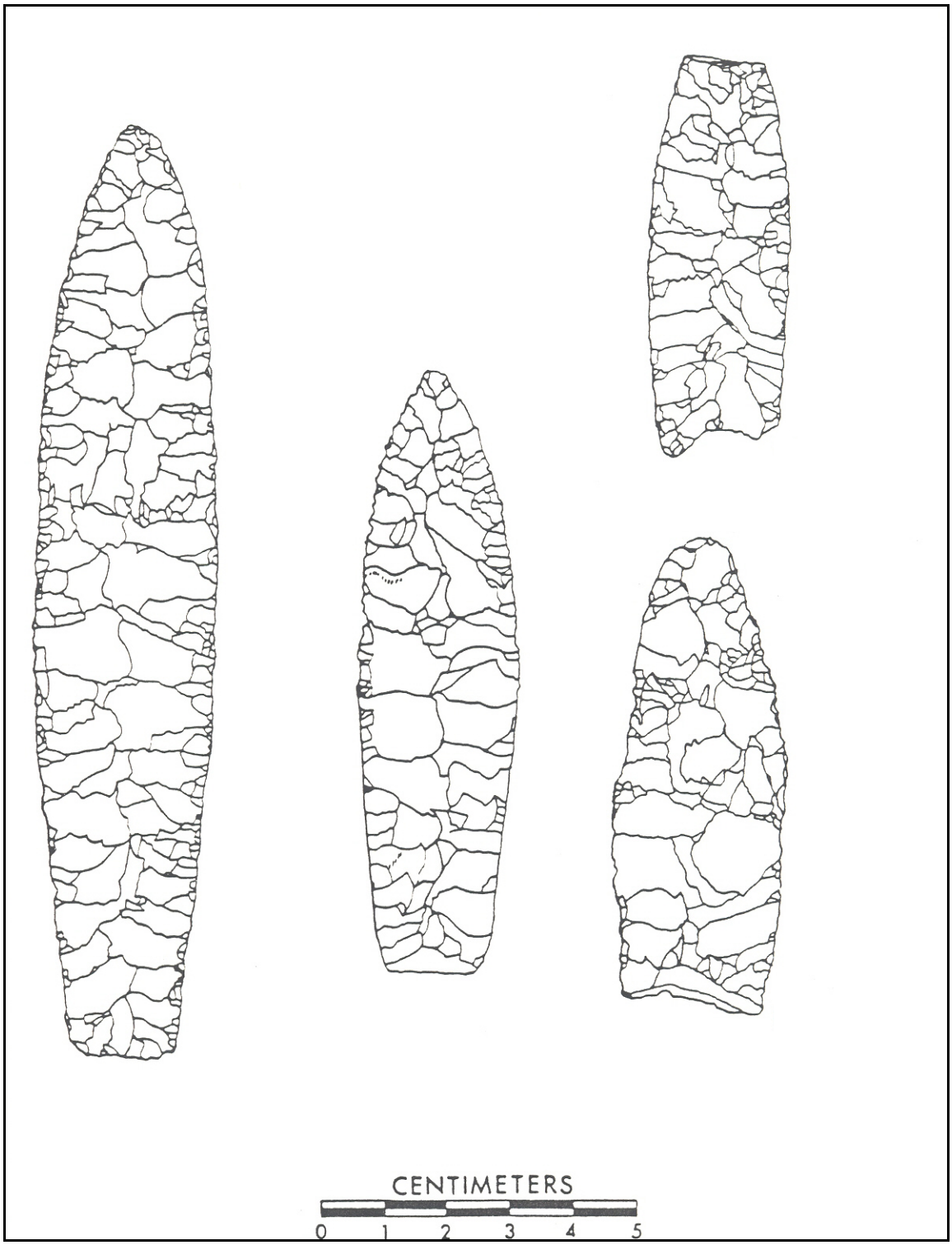

Figure 3.4. Cumberland cluster projectile points from Kentucky sites. The small resharpened specimen on the far right is from Great Rock Sink, Pulaski County, Kentucky.

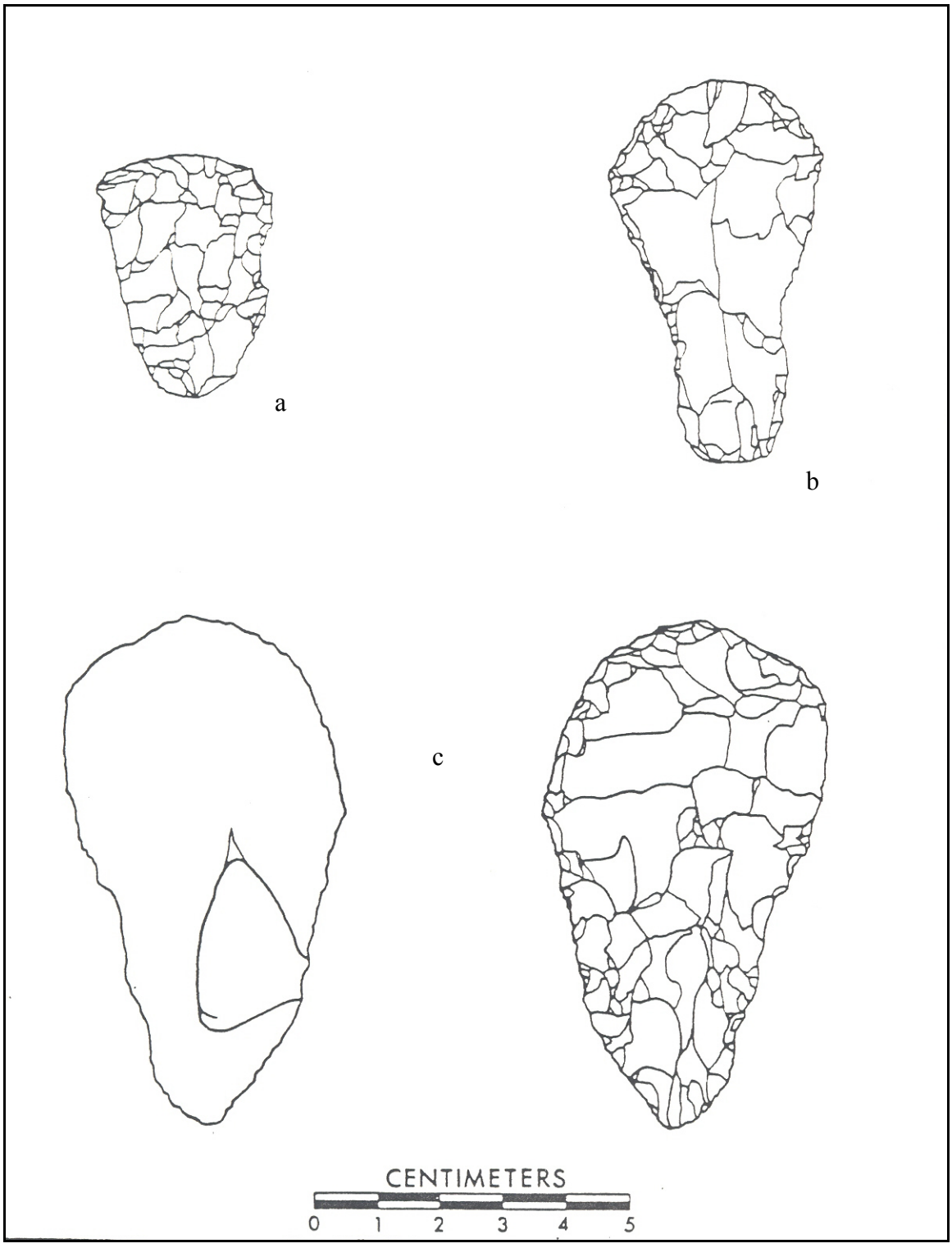

Figure 3.5. Early Paleoindian endscrapers: a-b, display grave spur; c, made on a blade (the reverse side illustrates bulb of percussion removal).

In general, the Middle Paleoindian phase is the least well-understood of the three Paleoindian phases. It is clear that important changes in lithic technology and stylistic diversity, along with a probable broadening of subsistence strategies, occurred during this time. How these changes relate to the known environmental shifts that also occurred during this phase is unknown. Archaeologists may speculate that environmental changes fostered increased regionalization, which resulted in a greater reliance on locally available resources and the development of distinct projectile point styles. These ideas, however, require additional data from both survey and excavation contexts in order to be tested.

LATE PALEOINDIAN (CA. 8,500-8,000 B.C.)

Late Paleoindian occupations are generally recognized by the presence of unfluted lanceolate projectile points. Like Early and Middle Paleoindian points, Late Paleoindian points are bifacially-flaked, lanceolate forms. However, they lack the characteristic flutes that are diagnostic of earlier projectile point types (Freeman et al. 1996; Ray 2003; Tankersley 1996). Basal and lateral edge grinding is typical. Projectile point bases may be concave, convex, or straight. The concave-based forms often display basal thinning flakes that are similar to flutes but technologically different and much shorter.

Late Paleoindian projectile points recovered from Kentucky sites can be assigned to two stylistic clusters: Lanceolate Plano and Dalton (Justice 1987; Ray 2003) The Lanceolate Plano cluster, includes both the Plainview and Agate Basin types. Neither type, however, is very common at Kentucky sites. The Dalton cluster includes Beaver Lake, Quad, and the classic Dalton types, which are much more common in the state (Justice 1987) (Figure 3.6).

Kentucky Lanceolate projectile points are very similar to those found on the Plains (Frison 1999; Stanford 1999; Wormington 1957). The presence of these points in Kentucky may be the result of a migration from the west, although this proposition has not been tested. Certain Lanceolate Plano points, in particular the Plainview type, are both morphologically similar to the earlier Clovis point, except that they lack the characteristic flute. However, the Agate Basin type is quite different. It is a long, narrow, parallel or slightly convex, lanceolate blade that displays uniform flaking (Stanford 1999). The base is usually straight, although slightly convex and even concave forms have been found. Concave-based Agate Basin points are frequently referred to as the Angostura variety (Justice 1984:50). Edge grinding of the haft element is always present and extensive, often more so than that found on other Paleoindian projectile point types. Lateral edge grinding usually extends to the midsection of the point Agate Basin points from Kentucky range in length from 5 to 13 cm, with an average length of 8.5 cm (Rolingson 1964:49).

Dalton cluster points are typically identified by their ‘fish-like’ appearance or by the common occurrence of obvious, extensive, and sometimes even beveled resharpening above the haft element (Ray 2003; Tankersley 1996). Both Beaver Lake and Quad points

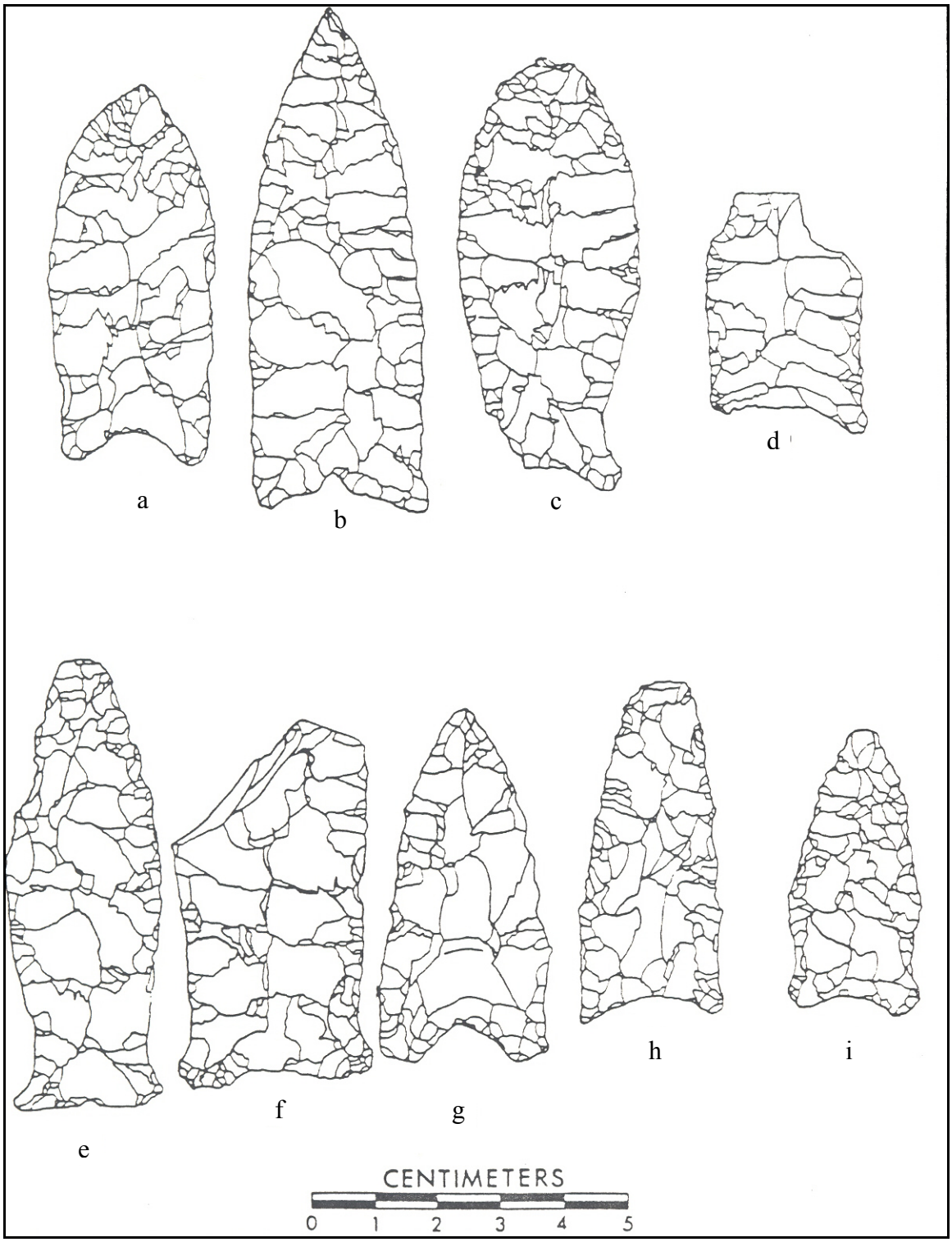

Figure 3.6. Dalton cluster points: a, Quad; b-f, Beaver Lake; g-i; Dalton.

have a 'fish-tailed' base. Except for the absence of flutes, these two types are morphologically similar to Cumberland points, but tend to be both shorter and narrower than earlier points (Ray 2003). It is this similarity that led investigators, such as Rolingson (1964), to conclude that most Beaver Lake points were simply unfluted Cumberland points. As Ray (2003:46-47) notes, however, channel fluting disappears entirely in the Late Paleoindian subperiod and is replaced by basal thinning.

Like Beaver Lake points, Quad points have a 'fish-like' shape and are short and wide. Beaver Lake points, in contrast, appear long and narrow. The basal ears of most Quad points project profoundly and often form the widest section of the point (Ray 2003; Tankersley 1996). In contrast, the midsection of a Beaver Lake point is wider than its base. Basal and lateral edge grinding is usually present but not always as pronounced as that exhibited by other types. Quad points from Kentucky range in length from 4.1 to 8.6 cm, but most cluster around 6.0 cm.

The classic Dalton type includes a great deal of variation, much of which can be attributed to a change in form due to extensive blade resharpening (Goodyear 1974; Ray 2000, 2003). These types of points frequently exhibit a serrated or right-handed beveled blade edge, or some combination of both traits. Through continued reuse and resharpening, these points eventually became whittled down to a stage where they were converted into other tool forms. Specimens in the final stage of resharpening often display a drill-like appearance but usually lack the blade edge wear associated with true drills. Edge grinding of the haft area is usually intensive. Dalton points from Kentucky range from 3.1 to 8.5 cm in length, with an average of 5.7 cm (Rolingson 1964:44).

Ray (2003:46-50) suggests that four major changes in lithic technology occurred between the Late Paleoindian subperiod and their earlier predecessors. These changes include a more intensive use of a wider range of locally available chert resources. Early and Middle Paleoindian points tend to be manufactured from high quality local and exotic raw materials, while the later points are often manufactured from lower quality materials. Secondly, channel fluting is replaced with basal thinning. Third, there appears to be a marked reduction in the size of projectile points. Mean length of the points studied in the Upper Rolling Fork survey conducted by Ray (2003:35-41) indicated a range of 8.1-5.7 cm for Early and Middle Paleoindian points and a range of 6.9-3.9 cm for Late Paleoindian points.

The final change in lithic technology that occurred during the Late Paleoindian subperiod was the extensive resharpening of projectile point blade margins. Clovis, Cumberland and Gainey points were typically resharpened only along the distal end of the point blade. Late Paleoindian points, in contrast, are often heavily resharpened along the lateral edges of the blade indicating substantial reuse. Multiple resharpenings often resulted in beveled and/or serrated margins, which are not typically present on earlier points (Ray 2000, 2003).

Aside from the wider range of stylistic diversity in diagnostic projectile points, Late Paleoindian lithic toolkits also are more diverse than those of the Early and Middle Paleoindian subperiods. A wide variety of bifacial and unifacial tools, including beveled and backed bifaces, unifacial and flake scrapers, adzes, retouched flakes, and drills/perforators, are common in Late Paleoindian assemblages (Goodyear 1999; Morse

1997; Tankersley 1996). The increased variety of tools and greater diversity of diagnostic styles is thought to represent ongoing regionalization as Late Paleoindian groups became increasingly localized in terms of settlement, subsistence practices, and resource use (Goodyear 1999; Ray et al. 1998).

The Late Paleoindian subperiod was marked by oscillating, but accelerating, environmental change (Muller 1986). Except for some high Appalachian peaks, Kentucky's vegetational cover had changed from spruce and jack pine parklands to mixed hardwood forests (Delcourt and Delcourt 1981). By Late Paleoindian time, large herbivores, such as mammoth, mastodon, horse, and moose/elk had become or were going extinct (Kunen and Anderson 1980). Open areas were most likely restricted to karst barrens and sandy terraces along major streams.

As these environmental changes unfolded, the Late Paleoindian diet continued the shift toward a broad-spectrum foraging economy, which had begun in the Early and Middle Paleoindian subperiods. Evidence from Late Paleoindian deposits at Dust Cave in Alabama attest to this trend. Faunal and botanical remains from Dust Cave indicate the exploitation of an extremely wide range of plants, including various nut species, and animals (fish, birds, reptiles, amphibians, and a variety of small and medium sized mammals) (Hollenbach 2007; Walker 2007; Walker and Driskell 2007).

The results from Dust Cave are not unique. Data from Late Paleoindian sites across eastern North America point to a subsistence pattern that emphasized a broad-spectrum foraging economy (Walker and Driskell 2007). Tankersley (1990b, 1996) has suggested that Late Paleoindian foragers became more generalized in response to the extinction of the Pleistocene megafauna, which necessitated the exploitation of less desirable small game resources. He has argued that because these smaller game animals were dispersed (i.e., not herd animals), Late Paleoindians were not as mobile as their Early and Middle Paleoindian predecessors (Tankersley 1996:35).

A reduction in mobility during the Late Paleoindian period does seem to have occurred, given the increased stylistic diversity of projectile points and the fact that more sites have been found in a wider range of settings throughout the state. For the first time, Paleoindians began to clearly occupy caves and rockshelters (in eastern, central, and western Kentucky), although open air settings remained the most common. There is also a larger number of Late Paleoindian sites compared to the Early and Middle Paleoindian subperiods, which may indicate an increase in population size and density.

Why Late Paleoindians began to inhabit a wider range of physiographic settings, exploit a wider range of resources, and reduce their mobility may be related to the extinction of Pleistocene megafauna as Tankersley (1990b; 1996) has suggested. It seems more likely, however, that these trends continue those begun during the Early and Middle Paleoindian subperiods and reflect the ongoing process of regionalization. As Late Paleoindians became increasingly familiar with the landscapes they occupied, they began to exploit more diverse local resources and move less, in effect, 'settling in' to particular environmental settings. As these groups 'settled in', they became tethered—both economically and socially (as is indicated by the diversity of point styles)—to specific regions and gave rise to the broad-spectrum economies that would come to characterize the subsequent Archaic period in Kentucky.

GENERAL STATEWIDE PATTERNS

Of the 366 sites that have Paleoindian components most were identified on the basis of one or a few diagnostic stone tools. Sites with Paleoindian components have been documented in 89 of Kentucky's 120 counties, but 31 counties have no recorded Paleoindian sites (Figure 3.7). Several factors may account for the absence of Paleoindian sites in these counties and the relative paucity of Paleoindian sites in general. First, it may simply represent the nature and intensity of the earliest occupation of the state. This would be consistent with the lower population densities that have been proposed for this period of colonization and initial regionalization (Anderson 1990; Anderson and Gillam 2000). Second, the high mobility of early populations was not conducive to the acquisition, production, and discarding of large quantities of materials (Binford 1980; Kelly 1995). With fewer cultural remains associated with Paleoindian site occupations, these types of sites have significantly reduced archaeological visibility relative to later components, thus making them difficult to locate. Lastly, their greater antiquity means these sites have had more time to be exposed to post-depositional forces (both natural and cultural) that may dislocate, alter, or destroy the remains of Paleoindian activity.

Of the 366 Paleoindian sites, slightly more than two-thirds were recorded before 1987 (n=247 or 67.5 percent). Despite this statewide trend, two management areas witnessed an increased rate in the number of Paleoindian sites recorded over the past two decades: Salt River and Upper Cumberland (Table 3.1). The increase in Paleoindian sites recorded for the Salt River Management Area is due almost entirely to the efforts of Jack Ray who surveyed a portion of the Upper Rolling Fork and Beech Fork Rivers (Ray 1998, 1999, 2003). The slight increase in sites documented in the Upper Cumberland Management Area is the result of a research project conducted in Cumberland County that was specifically focused on the recovery of Paleoindian data (Leon Lane, personal communication 2007).

Over one third of the Paleoindian sites in Kentucky have been classified as open habitations without mounds (Table 3.2). No Paleoindian sites have been identified as stone mound, earth mound, non-mound earthwork, or isolated burial site types (Table 3.2). The few sites that fall under the categories of petroglyph/pictograph, cemetery, and open habitation with mound(s) (Table 3.2) are multicomponent, and have only minimal evidence of Paleoindian use based on the recovery of one or a few diagnostic stone tools. Many other multicomponent sites likewise contain only one or perhaps a few cultural artifacts that are diagnostic of Paleoindian toolkits. Nearly one third of all Paleoindian sites are located in dissected upland settings (n=113 or 30.9 percent), and one quarter of the sites are in floodplain settings (n=93 or 25.4 percent) (Table 3.3).

Some of the densest concentrations of Paleoindian sites are located: 1) along the Little, Green, and Ohio Rivers in the Green River Management Area; 2) along the Upper Rolling Fork and Beech Fork Rivers in the Salt River Management Area; 3) in Cumberland and Pulaski Counties in the Upper Cumberland Management Area; and 4) in the Central Bluegrass Section (Figure 3.7). In fact, more Paleoindian sites have been

Table 3.1. Distribution of Paleoindian Sites by Management Area and Section.

Management Area/Section	Sites Recorded Before 1987	Sites Recorded Since 1987	Total
Purchase			
Mississippi River	8	0	8
Ohio River I	7	0	7
Lower Tennessee /Cumberland	11	2	13
Total	26	2	28
Percent	92.9	7.1	
Green River			
Ohio River II	20	4	24
Western Coalfield	29	1	30
Pennyroyal	41	13	54
Upper Green River	12	13	25
Total	102	31	133
Percent	76.7	23.3	
Salt River			
Salt River	28	45	73
Total	28	45	73
Percent	38.4	61.6	
Upper Cumberland			
Lake Cumberland	12	18	30
Southeastern Mountains	4	0	4
Total	16	18	34
Percent	47.1	52.9	
Bluegrass			
Central	37	12	49
Northern	8	3	11
Eastern	9	2	11
Total	54	17	71
Percent	76.1	23.9	
Upper Kentucky / Licking			
Gorge	4	3	7
Interior Mountains	3	2	5
Total	7	5	12
Percent	58.3	41.7	
Big Sandy			
Lower Big Sandy	13	0	13
Upper Big Sandy	1	1	2
Total	14	1	15
Percent	93.3	6.7	
Entire State			
Total	247	119	366
Percent	67.5	32.5	100.0

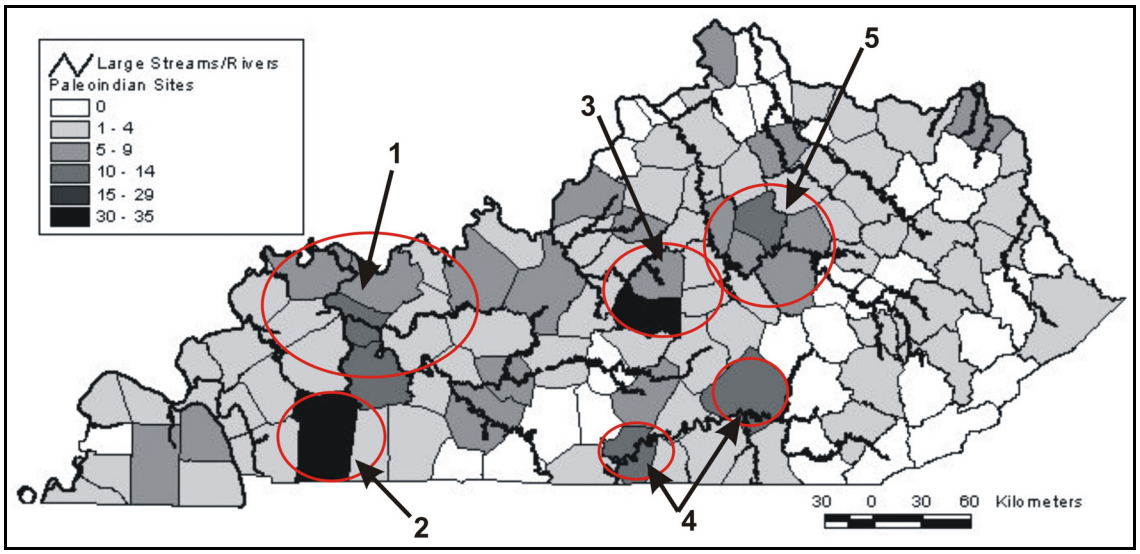

Figure 3.7. Distribution of Paleoindian Sites (numbered areas highlight denser concentrations): 1, Ohio River II Section and lower Green River of the Western Coalfield Section of the Green River Management Area; 2, Little River in the Pennroyal Section of the Green River Management Area; 3, Upper Rolling Fork River of the Salt River Management Area; 4, Cumberland and Pulaski Counties in the Lake Cumberland Section of the Upper Cumberland Management Area; and 5, Central Bluegrass Section of the Bluegrass Management Area.

recorded in Christian County (n=35 or 9.6 percent), located in the Green River Management Area, and Marion County (n=30 or 8.2 percent), located in the Salt River Management Area, than any other county in Kentucky. More detailed discussion of these concentrations and other regional trends in Paleoindian occupation of the state are presented in the following discussions of each of the management areas.

The first step in any archaeological investigation is identifying where the sites are located. This step has consumed much (though not all) of the research efforts on the Paleoindian Period up to this point in Kentucky. We have a reasonable, albeit incomplete, understanding of where Paleoindians were locating themselves on the landscape based on the distribution of their diagnostic stone tools. Filling in the gaps of the distribution of these sites (as noted below) and focusing more intensively on recovering additional data (e.g., subsistence remains, internal spatial organization of activity areas, etc.) are sorely needed in order to address more complex questions regarding the nature of Paleoindian societies. Overall, few Paleoindian sites in Kentucky have been investigated beyond their initial documentation during survey. Those that have been investigated and have yielded significant data (particularly from intact deposits) are presented with each of their respective management areas and sections below (Table 3.4). In addition, sites that have the *potential* to yield significant data if further studies are undertaken are also discussed in the following sections (Table 3.4).

Table 3.2. Distribution of Paleoindian Sites by Management Area and Site Type.

Site Type	Pur-chase	Green River	Salt River	Upper Cumberland	Blue-grass	Upper Kentucky/ Licking	Big Sandy	Total	Percent
Open Habitation w/out Mound(s)	25	111	67	26	65	6	15	315	86.1
Isolated Find	2	4						6	1.6
Rockshelter		4	2	4		5		15	4.1
Cave		3	2	3				8	2.2
Quarry	1	1		1				3	0.8
Mound Complex						1		1	0.3
Non-Mound Earthwork								0	0.0
Workshop		4	1		1			6	1.6
Cemetery		2	1					3	0.8
Specialized Activity Site		1			4			5	1.4
Open Habitation w/ Mound(s)		3			1			4	1.1
Total	28	133	73	34	71	12	15	366	100.0
Percent	7.7	36.3	19.9	9.3	19.4	3.3	4.1	100.0	

Table 3.3. Distribution of Paleoindian sites by Management Area and Landform.

Landform	Purchase	Green River	Salt River	Upper Cumberland	Blue-grass	Upper Kentucky/ Licking	Big Sandy	Total	Percent
Floodplain	9	24	20	6	18	4	12	93	25.4
Terrace	3	14	12	7	16	2	3	57	15.6
Hillside	5	16	9	6	6	3	0	45	12.3
Dissected Uplands	11	41	27	9	23	2	0	113	30.9
Undissected Uplands	0	35	3	6	8	1	0	53	14.5
Other	0	3	2	0	0	0	0	5	1.4
Total	28	133	73	34	71	12	15	366	100.0
Percent	7.7	36.3	19.9	9.3	19.4	3.3	4.1	100.0	

Table 3.4. Significant Paleoindian Sites.

Site Number	Site Name	Reference
Purchase Management Area		
Mississippi River Section		
None		
Ohio River I Section		
None		
Lower Tennessee/Cumberland Section		
15Cw241		Kerr and Tuma 1998
15Ly27	Henderson	Rolingson 1964
15Tr10	Roach Village	Rolingson 1964
Green River Management Area		
Ohio River II Section		
15Bc282	Brother Abraham	Mocas 1993a
15Bc283	George Branch Shelter A	Mocas 1993b
15Cn50		Miller and Striker 2005
15Da32	Clark	Creasman 1993a
15Da33	Abe Carter	Creasman 1993a
Western Coalfield Section		
15Hk45	Parrish Village	Webb 1951; Rolingson 1964
Pennyroyal Section		
15Ch90	Adams	Sanders 1990; Sanders and Maynard 1979; Haag 2004
15Ch236	Boyd (Ledford)	Freeman and Smith 1992; Sanders and Maynard 1979
15Ch482	Roeder	Freeman et al. 1996
15Ch483	Ezell	Freeman et al. 1996
15Ch572		Versluis 1999
Upper Green River Section		
15Ad122		Baltz et al. 1998
15Ad125		Baltz et al. 1998
15Cs18		Ray 2003
15Ta80		Baltz et al. 1998
15Ta88		Baltz et al. 1998
15Ed422	Brier Creek	Davis 1999
Salt River Management Area		
15Bo16	Danville Tank	Niquette 1984; Boedy and Niquette 1987
15Bu244	Hall's Cave	Wilson et al. 1983
15Hd583	Joe Priddy	Haag 2004
15Jf243	Longworth Gick	Collins 1979; French 1998
15Mn28		Ray 2003
15Mn32		Ray 2003
15Mn59		Ray 2003
15Mn100-115		Ray 2003
15Mn310		Ray 2003
15Mn317		Ray 2003
15Mn329		Ray 2003
15Mn342		Ray 2003
15Mn355		Ray 2003
15Mn359		Ray 2003
15Ne34		Ray 2003
15Ne88-90		Ray 2003

Table 3.4. Continued

Site Number	Site Name	Reference
15Ws30-34		Ray 2003
15Ws36-37		Ray 2003
Upper Cumberland Management Area		
Lake Cumberland Section		
15Cu21	Wolfe Shelter	Lane 1996a; Lane et al. 1995
15Cu41		Creasman 1993b
15Cu43	Crawley Farmstead	Lane 1996b
15Cu44	Alma Nation	Lane 1995
15Cu46	Stella Cross	Lane 1996c
15Cu63	Sexton Fork	Lane 1996d
15Cu64	Owsley Farm	Lane and McBride 1997
15Cu67	Lewis Creek	Lane 1997a
15Cu74		Lane and Shields 1997
15Cu81	Clint Carter	Lane 1997b
15McY412	Oil Well Branch Road	DesJean 1993
15Pu18	Great Rock Sink	Tankersley 1990b
15Wn71		Bybee 2003
Southeastern Mountains		
15Kx5		Turnbow and Allen 1977
Bluegrass Management Area		
Central Bluegrass Section		
15Hr14	Adams Mastodon	Duffield and Boisvert 1983; Walters 1988
15Fa163	Clays Ferry Crevice	Tankersley 1990b
15Js116	Snowden	Fiegel 1994
Northern Bluegrass Section		
15Be18/15Be269-272	Big Bone Lick	Lowthert 1998; Tankersley 1985, 1987
Eastern Bluegrass Section		
15Ni2	Lower Blue Licks	Boisvert 1984
15Lf78	Upper Blue Springs	Boisvert 1984
Upper Kentucky/Licking Management Area		
Interior Mountains Section		
15Pe50	Enoch Fork Rockshelter	Bush 1988; Evans 1995
Big Sandy Management Area		
Lower Big Sandy Section		
15Jo14	Mayo	Rolingson 1964
Lower Big Sandy Section		
15Pi96	Cowpen Creek	Baltz 1995

PURCHASE MANAGEMENT AREA

The Purchase Management Area has relatively few Paleoindian sites (n=28). All but two of the sites were recorded before 1987. Most of the Paleoindian sites are located in dissected upland (n=11 or 39.3 percent) and floodplain settings (n=9 or 32.1 percent) (Table 3.3). No Paleoindian sites have been identified in undissected upland settings in this management area.

There are two possible explanations for this relative paucity of Paleoindian sites. First, given the active alluvial history of the Mississippi and Ohio Rivers, which border two of the sections in this management area, Paleoindian sites may be deeply buried (see Autry et al. 1989), and thus difficult to detect with traditional survey methods. This active alluvial history also may result in the dislocation of archaeological materials, which would further complicate efforts to identify the loci of Paleoindian activity. Lastly, few projects have specifically targeted Paleoindian research topics in the Purchase Management Area, and those that have were completed before 1987 (e.g., Gatus and Marquardt 1984; Rolingson 1964).

MISSISSIPPI RIVER SECTION

Only eight Paleoindian sites have been identified in the Mississippi River Section, all of which were recorded prior to 1987. Most of these sites are classified as open habitations without mounds (Table 3.5), and most are multicomponent. The only other Paleoindian site types represented in this section consist of two isolated finds and a quarry (Table 3.5). The only county for which no Paleoindian sites have yet been recorded in this section and management area is Carlisle County. Paleoindian projectile points were recovered from three Mississippian sites (Flanary [15Cn2], McLeod Bluff [I5HiI] and Sassafras Ridge [15Fu3] [Rolingson 1964]), and from the surface of the Early Archaic Youngblood site (l5Gv26) (Gatus and Marquardt 1984). Given the active alluvial history of the Mississippi River, there is a potential for the discovery of buried sites in this section. Open habitation sites also should be present on the high bluffs that overlook the Mississippi River Valley.

Table 3.5. Purchase: Site Type by Management Area Section.

Site Type	Mississippi River	Ohio River I	Lower Tennessee / Cumberland	Total	Percent
Open Habitation w/out mound(s)	5	7	13	25	89.3
Isolated Find	2			2	7.1
Quarry	1			1	3.6
Total	8	7	13	28	100.0
Percent	28.6	25.0	46.4	100.0	

OHIO RIVER I SECTION

The seven Paleoindian sites in the Ohio River I Section were all recorded before 1987. These sites represent one quarter of those identified in the Purchase Management Area. All are open habitations without mounds (Table 3.5). Additional Paleoindian sites in this section may be buried under alluvium along the Ohio River, and also should be present on elevated areas overlooking the floodplain.

LOWER TENNESSEE/CUMBERLAND SECTION

Almost half of the Paleoindian sites in the Purchase Management Area are located in the Lower Tennessee/Cumberland Section (n=13). All are open habitations without mounds (Table 3.5), with only two recorded since 1987. The Lower Tennessee/Cumberland Section is situated within well-developed karst terrain consisting of an extensive sinkhole plain with scattered knobs and ridges. High quality lithic resources are abundant in this region. As a result, it is expected that more Paleoindian sites of varying site types will eventually be identified and recorded in this section. Most of the sites that have been investigated, such as Henderson (15Ly27) and Roach Village (15Tr10), are multicomponent open habitation sites with limited evidence of Paleoindian occupation (Rolingson 1964).

The Henderson site (l5Ly27) is located in Lyon County near the confluence of the Eddy Creek and the Cumberland River. Prior to professional investigations at the site, seven Paleoindian projectile points of the Clovis, Cumberland, and Dalton clusters were collected from the immediate vicinity by local collectors (Rolingson 1964:57). Given the large collection of Paleoindian material and the possibility of impact from Lake Barkley, investigations were conducted in 1958. Several trenches were excavated at the site. Each trench was excavated to a depth of 29.4 cm. Paleoindian and Archaic lithic material was recovered from the upper 15.2 cm of the excavations. Unfortunately, the site's cultural deposits were not only shallow but also deflated and entirely mixed. The Paleoindian material recovered during excavation included two possible Cumberland projectile point fragments and a large assemblage of unifacial tools.

The Roach Village site (l5Trl0) is located approximately 0.4 km from the Tennessee River in Trigg County. Before inundation by Kentucky Lake, excavations were conducted during a two month period in 1941. These excavations identified three distinct strata: a disturbed plowzone; an intact stratum containing a Mississippian house basin; and a deflated and mixed basal stratum containing Woodland, Archaic, and Paleoindian artifacts (Rolingson 1964).

Site 15Cw241 is another multi-component open habitation site from which Paleoindian materials have been recovered (Kerr and Tuma 1998). This site is located on a ridge spur along Blood River in Calloway County. It contains evidence of Early and Late Paleoindian occupations, based on the recovery of two Clovis and two Dalton cluster projectile points. Although these points were recovered from the site's surface, it

is still fairly unusual for a Kentucky site to yield this many Paleoindian diagnostics. Taken together with the other Paleoindian sites that have been recorded in this section, it is apparent that this was an area of significant, focused occupation throughout the Paleoindian period.

GREEN RIVER MANAGEMENT AREA

Over one-third of all Paleoindian sites in Kentucky have been recorded in the Green River Management Area (n=133 or 36.3 percent). No other management area has as many Paleoindian sites. Furthermore, no other management area has as many different site types with associated components assigned to this temporal unit (Table 3.2), with most of the sites classified as open habitation without mounds (n=108 or 81.2 percent) (Table 3.6). Within this management area, sites tend to be associated with dissected upland (n=41 or 30.8 percent) or undissected upland settings (n=35 or 26.3 percent) (Table 3.3). Over three quarters of the Paleoindian sites in the Green River Management Area were recorded before 1987 (n=102 or 76.7 percent).

Table 3.6. Green River: Site Type by Management Area Section.

Site Type	Ohio River II	Western Coalfield	Pennyroyal	Upper Green River	Total	Percent
Open Habitation w/out mound(s)	22	28	45	16	111	83.5
Isolated Find	1	1	2		4	3.0
Rockshelter	1		1	2	4	3.0
Cave			1	2	3	2.3
Quarry			1		1	0.8
Workshop			2	2	4	3.0
Cemetery				2	2	1.5
Specialized Activity Site				1	1	0.8
Open Habitation w/ Mound(s)		1	2		3	2.3
Total	24	30	54	25	133	100.0
Percent	18.0	22.6	40.6	18.8	100.0	

OHIO RIVER II

Fewer Paleoindian sites have been recorded in the Ohio River II Section than any other section within the Green River Management Area (n=24 or 18.0 percent), and most of those were recorded prior to 1987 (n=20 or 83.3 percent). With the exception of one isolated find (15Cn2) and one rockshelter (15Bc283), all are open habitations without mounds, which tend to be located along the Ohio and Green rivers (Figure 3.7). Given the well-developed floodplains in this section, it is expected that intact, buried Paleoindian sites will be identified along the Ohio River. Additional Paleoindian deposits are likely to be identified on elevated areas overlooking the Ohio valley and other waterways, and in rockshelters.

Limited excavations conducted at two multicomponent sites located in Daviess County, Clark (15Da32) and Abe Carter (15Da33), documented the presence of ephemeral Paleoindian occupations (Creasman 1993). The Clark site is located on a “low

relief ridge of a broad, flat outwash plain south of the Ohio River" (Creasman 1993:62). The nearby Abe Carter site is located "along the top and south slope of a low relief knoll of a broad flat terrace" (Creasman 1993:80). The limited evidence for Paleoindian occupation of these sites was based on the recovery of a fluted projectile point fragment (Clovis?) from subsurface context at each location (Creasman 1993:31). In addition, at the Clark site, a unifacial spurred endscraper was recovered from the same excavation context as the fluted point fragment (Creasman 1993:69). Based on the paucity of materials recovered and the lack of associated features, these sites were interpreted as short duration extractive camps (Creasman 1993).

Other sites in this section that have yielded Paleoindian materials include the Brother Abraham site (15Bc282), George Branch Shelter A (15Bc283), and Site 15Cn50 (Mocas 1993a, 1993b; Eric Schlarb, personal communication 2007). The Brother Abraham site is an open habitation located on a bench above the south side of the George Branch of Rough River. Paleoindian occupation of this site is evidenced based on at least six diagnostic projectile points (largely from a private collection), including those of the Cumberland, Beaver Lake, Quad, and Dalton varieties (Mocas 1993a). The presence of these materials points to Middle and Late Paleoindian use of this site.

The George Branch Shelter A is located directly below the Brother Abraham site. The only diagnostic recovered from the shelter was a Dalton point. In addition, at least one human burial was reportedly looted from this shelter, though no intact burials were noted at the time of survey (Mocas 1993b). If it is a single component Dalton site, and if the burial actually did exist, this would be the only Late Paleoindian burial site identified in the state. Late Paleoindian burials, even cemeteries, are known from outside the state (e.g., the Sloan site in Arkansas [Morse 1975, 1997]), but none have been recorded in Kentucky.

Site 15Cn50 is a stratified rockshelter in Crittenden County that was occupied from the Late Paleoindian phase through the Mississippi period (Eric Schlarb, personal communication 2007). Two Beaver Lake/Dalton-type points were recovered from the lowermost levels, along with other associated debitage. Analysis of the materials and samples collected from this site is on-going, but it is expected to provide information on Paleoindian subsistence and settlement patterns. This site type is not common in western Kentucky. There are only four other rockshelter sites in the Green River Management Area with Paleoindian components (Table 3.6).

WESTERN COALFIELD

All but one of the 30 Paleoindian sites in the Western Coalfield Section were recorded before 1987. This section has the second highest number of Paleoindian sites in the Green River Management Area (n=30 or 22.6 percent). These sites are represented primarily by open habitations without mounds (n=27 or 90.0 percent) (Table 3.6). A concentration of Paleoindian sites in this section, particularly in McLean and Muhlenberg Counties, is located along the Green River (Figure 3.7). Relatively few sites with Paleoindian deposits have been investigated in this section, and those that have were

excavated during the WPA era of Kentucky archaeology. Paleoindian artifacts were recovered from Archaic shell midden sites (Indian Knoll [15Oh2], Carlston Annis [15Bt5], and Austin [15McL13]), three non-shell midden Archaic sites (Barrett [15McL4], Butterfield [15McL7], and Parrish Village [15Hk45]), and from a Mississippian village (Morris Village [15Hk49]) (Rolingson 1964). While the Paleoindian components at most of these sites were obscured by later habitations, the artifact assemblage at Parrish Village suggests that this site contains a substantial Paleoindian occupation.

Parrish Village lies in the northwestern portion of Hopkins County near the confluence of Rose, Weirs, and Clear Creeks (Rolingson 1964). The topography is hilly with broad valleys and swampy floodplains. The recovery, by local collectors, of two Clovis and two Cumberland points from the site's plowzone prompted the University of Kentucky to excavate the site between 1939 and 1940. Four additional fluted points and a large assemblage of unifacial tools were recovered from a midden deposit at a depth of 30.5 and 45.7 cm below surface. Unfortunately, numerous Late Archaic features, including more than 100 burials also were recovered from this cultural stratum. The deflated nature of this site is typical of Paleoindian open habitations in most of western Kentucky.

PENNYROYAL

Slightly more than forty percent of the Paleoindian sites in the Green River Management Area have been recorded in the Pennyroyal Section (n=54 or 40.6 percent) (Table 3.1). Christian County (n=35) has the most Paleoindian sites of any of the counties that comprise this section as well as the entire state. On the other hand no Paleoindian sites have been recorded in Allen or Simpson counties. The large number of Paleoindian sites documented in this section may be due to its karstic topography and the availability of high quality chert. There are numerous sinkholes, sinkhole ponds, springs, and active caves, many of which have Paleoindian sites documented in their vicinity. Most of the Paleoindian sites in the Pennyroyal Section are open habitations without mound(s) (n=45 or 83.3 percent), though several other site types also are represented (Table 3.6).

The relatively high number of recorded Paleoindian sites in Christian County is due in part to focused Paleoindian research efforts along the Little River (Freeman et al. 1996; Gatus and Marquardt 1984; Gramly and Yahnig 1991; Sanders 1990; Sanders and Maynard 1979). At least 12 Paleoindian sites have been documented in this drainage, including a series of lithic workshop-habitation sites and isolated artifacts. Perhaps the most significant of these sites are Adams (15Ch90), Boyd (15Ch236; also referred to as Ledford), Roeder (15Ch482), and Ezell (15Ch483) (Freeman et al. 1996; Sanders 1990; Sanders and Maynard 1979). All appear to have been occupied during the Early Paleoindian subperiod based on the recovery of Clovis projectile points and/or abundant cores, blades, bifaces, and other debitage that are considered characteristic of the production of these fluted points.

The Adams site is located in Christian County near the town of Hopkinsville. The site is situated along the margin of a large sinkhole overlooking the North Fork of the Little River (Sanders 1990; Sanders and Maynard 1979:168; see also Haag 2004). High-quality chert nodules from the Blue River Group are available in residuum at the site, in limestone outcrops exposed along the Little River, and in the alluvium of the river and its intermittent tributaries. Examination of this locality has documented the presence of a large concentration of manufacturing debris on the surface of the site. Carl Yahnig, a local avocational archaeologist, has intensively collected the site since 1975 and has obtained a sample of artifacts. Thomas Sanders (1983, 1990) analyzed Yahnig's collection in conjunction with his own controlled surface collection of the site. He found that the artifact assemblage exhibits a remarkable uniformity in the selection of raw material and "technological practices" (Sanders 1983:198). All the temporally diagnostic artifacts from this site are fluted projectile points, and Yahnig and Sanders have recovered multiple examples of every stage of the fluted point manufacturing sequence (Figure 3.2). Additionally, large prepared cores, identical to those described by Green (1963) for the Clovis culture, and unifacial tools made on blades and flakes have been recovered. On the basis of these findings, Sanders considered Adams to be a single component Clovis site. Single component Clovis sites are extremely rare in the eastern United States, making the Adams site worthy of more in-depth investigations.

The Boyd site is located less than 2 km directly north of the Adams site in Christian County. The site is situated on a narrow ridge spur facing an acute bend in the North Fork of the Little River (Sanders and Maynard 1979). Like the Adams site, high quality chert nodules are prolific near the site. An intensive but nonsystematic collection of artifacts has been made from the plowzone by Carl Yahnig. His collection includes a multitude of fluted points in various stages of manufacture, prepared blade cores and blade tools, flake tools, and a large quantity of manufacturing debris (Yahnig 1986) (Figure 3.3). In this respect, artifacts from the site duplicate the Adams site assemblage. Unlike Adams, however, Boyd is a multicomponent site that contains late Paleoindian, Early Archaic, and Late Archaic materials

Limited excavations, coring, and/or trenching have been conducted at the Ezell and Boyd sites, which also are located along the Little River in Christian County (Freeman et al. 1996; Freeman and Smith 1992; Gatus and Marquardt 1984; Sanders 1990). As noted by Freeman et al. (1996:401), the Little River Complex consists of sites are primarily retooling loci for the manufacture-replacement of the lithic component of the inhabitant's tool kits. However, these interpretations are based largely on surface materials. Given the potential for intact deposits at Boyd and Ezell (Freeman et al. 1996:398-401), it seems likely that future investigations may offer additional information on the nature of Paleoindian use and occupation in the Little River drainage. Another site that may yield evidence of Early Paleoindian occupation of this area is Site 15Ch472, which is located along the South Fork of the Little River (Versluis 1999). The basal fragment of a Clovis point was recovered from this site (Versluis 1999:23).

Mention also should be made of Savage Cave (15Lo11), which is located in Logan County. This site consists of both a true limestone cave and the surface immediately surrounding the cave's entrance. During the 1960s, Savage Cave received considerable attention as an alleged example of a "Paleolithic" or "Early Man" site

(Schenian 1988). These claims to antiquity were based primarily on the assumption that the 14 Paleoindian projectile points in the collection of the late Genevieve Savage came from stratified alluvial deposits in the cave; the same deposits that contained the remains of extinct Pleistocene fauna, including two species of peccary. This, however, was not the case. All of the Paleoindian projectile points were recovered from deflated plowzone contexts outside the cave (Kenneth Carstens, personal communication 1986). While the cave may have been exploited for water and chert, Schenian's (1988) reexamination of the site has demonstrated that evidence for a Paleoindian period habitation within the cave is lacking.

UPPER GREEN RIVER

Like the Pennyroyal Section, the Upper Green River Section is also dominated by karst topography. The Upper Green River Section is the only section in this management area for which more Paleoindian sites have been recorded in the last two decades (n=13) than in the years before 1987 (n=12) (Table 3.1), with the first Paleoindian sites being documented in reported in Casey and Taylor counties. There are still three counties (Barren, Green, and Metcalfe) in this section, however, where no Paleoindian sites have been recorded. Over half of the sites in this section are open habitations without mound(s) (n=14 or 56.0 percent), however six other site types are also represented (Table 3.6). The Upper Green River Section has not been the focus of as many projects geared specifically toward Paleoindian research topics as the Pennyroyal Section.

Although several Paleoindian sites have been recorded in the Upper Green River Section, none have been investigated in detail (Table 3.10). Kenneth Carstens' (1980) surface survey of the Mammoth Cave area in the late 1970s, however, identified some potentially significant Paleoindian sites both within the National Park and in immediately adjacent areas. These sites, include Patch Rockshelter (15Ed42), Blue Spring Hollow (15Ed52), Elmore Rockshelter (I5Ed212), and Chestnut Grove (15Ht28). Paleoindian occupation of these sites was identified based on the presence of diagnostic stone tools, though their potential to yield intact deposits is unknown. In addition, a Clovis point manufactured from Hixton Silicified Sandstone, was collected from the surface near the Historic Entrance of Mammoth Cave (15Ed1) (Tankersley 1989b).

Three projects (Baltz et al. 1998; Davis 1999; Lane and Gordon 1997) undertaken since 1987 also have identified several sites that have the potential to contain significant Paleoindian data. While surveying the fluctuation zone around Green River Lake, Baltz et al. (1998) identified four previously undocumented Late Paleoindian sites (15Ad122, 15Ad125, 15Ta80, and 15Ta88). Different (though stylistically similar) diagnostics were recovered from each of the sites, including Quad and Plano Cluster points (15Ad122), a Beaver Lake point (15Ad125), a Hi-Lo Cluster point (15Ta80), and a Dalton point (15Ta88). Given their location along the lake shoreline, all of these sites have been moderately to heavily impacted by sheet and bank erosion. The boundaries of at least two sites (15Ad122 and 15Ad125) likely extend beyond the area of erosion and may contain intact deposits that have not yet been investigated (Baltz et al. 1998). Despite the

lack of substantial intact deposits at sites 15Ta80 and 15Ta88, they are of interest because prehistoric occupation at these sites may have been limited to the Late Paleoindian subperiod. Further investigation of four of these sites is needed, based largely on the possibility of recovering additional data on their Paleoindian occupations (Baltz et al. 1998).

Another potentially important Paleoindian site in this section, the Brier Creek site (15Ed422), was located along the edge of two adjacent sinkholes on a bluff overlooking the Brier Creek stream valley. Though consisting only of a small scatter of lithic tools and debris, this site is considered significant. The site is interpreted as a single component Paleoindian hunting camp or extractive site that appears to have been the result of a single event or occupation (Davis 1999:41). The lone diagnostic stone tool from this site consisted of a Middle Paleoindian Cumberland projectile point that was recovered from a shovel probe in intact subsurface context. It is rare to identify a single component Paleoindian site with intact subsurface deposits, much less one from the Middle subperiod, which is poorly understood in Kentucky and elsewhere in the Southeast or Midwest.

The Red Sand site (15Ht46) is located along the Nolin River in Hart County. Limited excavation of this site in 1997 documented the presence of buried Late Paleoindian-Early Archaic deposits (Lane and Gordon 1997). A Kirk Corner-Notched project points, several endscrapers, a variety of bifaces, and debitage was recovered from these deposits. All of the tools and debitage pointed to a reliance on locally available cherts. The presence of a Clovis variant projectile point and blade-like flakes from disturbed contexts suggests the site also may contain a Late Paleoindian component. Additional research at this site has the potential to contribute to our understanding of Paleoindian lifeways and how people adapted to the changing Late Pleistocene-Early Holocene environment.

SALT RIVER MANAGEMENT AREA

The Salt River Management Area has the second highest number of Paleoindian sites in the state (n=73 or 19.9 percent). The majority have been recorded since 1987 (n=45 or 61.6 percent), with most classified as open habitations without mound(s) (n=66 or 90.4 percent) (Table 3.7). Paleoindian sites in this management area tend to be on dissected upland (n=27 or 37.0 percent) or floodplain settings (n=20 or 27.4 percent) (Table 3.3). Oldham County is the only county in the Salt River Management Area where no Paleoindian sites have been recorded.

Table 3.7. Salt River: Site Type by Management Area Section.

Site Type	Total	Percent
Open Habitation w/out mound(s)	67	91.8
Rockshelter	2	2.7
Cave	2	2.7
Workshop	1	1.4
Cemetery	1	1.4
Total	73	100.0
Percent	100.0	

The Longworth-Gick site, located along the Ohio River, exemplifies the potential to recover Paleoindian materials from buried floodplain deposits. Fluted points were recovered from this multicomponent site, along with substantial evidence of later Archaic occupation (Collins 1979; French 1998). Beyond the recovery of these points, however, the nature of Paleoindian occupation at this site has not been thoroughly investigated.

The Howe Valley Rockshelter site (15Hd12) is located in Hardin County. The site is situated along a steep ridge overlooking a karst plain. Four Beaver Lake points are reported from the site, but details concerning their exact stratigraphic position are lacking (Rolingson 1964). Nonetheless, the occurrence of these artifacts at the site suggests that a late Paleoindian component may be present in the basal layers of the rockshelter.

Another important Paleoindian site located in Hart County, is the Joe Priddy site (15Hd583) (Haag 2004; Lane et al. 1997; Stackelbeck 1996). This site encompasses more than 9,000 m^2 and is located adjacent to sinkhole. Among the Paleoindian artifacts recovered from this site was the midshaft of a lanceolate fluted project points and a conical blade core, blade flakes from blade cores that are bifacially reduced, unmodified flakes, and retouched flakes that are indicative of a Clovis blade technology (Haag 2004:5; Stackelbeck 1996). The site appears to have been a short-term habitation site, a quarry, or a workshop (Lane et al. 1997; Stackelbeck 1996).

There is a notable concentration of Paleoindian sites in the south-central part of this management area (Figure 3.7). More Paleoindian sites have been recorded in Marion County (n=30 or 41.1 percent) than any other county in the Salt River Management Area; compared to other counties statewide, it is second only to Christian County in the Green

River Management Area. Of interest is the fact that the sites recorded in Marion and adjacent Washington County represent a relatively high percentage of the total number of Paleoindian sites documented in this management area. Paleoindian sites account for over 16 percent of the site recorded in Marion County and 18 percent of the sites recorded in Washington County.

The relatively high percentage of Paleoindian sites in Marion and Washington counties is the direct result of a single project along the Upper Rolling Fork and Beech Fork Rivers (Ray 1998, 1999, 2003). Based on this multi-year study, Ray recorded 37 sites with Paleoindian components in Marion (n=25 sites), Washington (n=7 sites), Nelson (n=4 sites), and Casey Counties (n=1 site). Much of this work involved interviews with local collectors and documentation of the projectile points in their collections (Ray 2003). In addition to recording the locations from which diagnostic stone tools were derived, Ray (2003) collected data on tool types, metrics, and raw material using a modified "Paleoindian Point Data Form." This form is part of a nationwide effort to document the presence and density of Paleoindian sites in North America (Anderson and Faught 19980) (Ray 2003:17). Four of the sites contained Early Paleoindian diagnostics (i.e., Clovis points), 13 had Middle Paleoindian diagnostics (i.e., Gainey and/or Cumberland points), and 20 had Late Paleoindian diagnostics (i.e., Quad, Beaver Lake, Dalton and/or Hardaway points) (Ray 2003:Tables 3-6).

Ray (1998, 1999) also conducted geoarchaeological assessments of the chert resources and landforms along the Upper Rolling Fork River. He then used these data in conjunction with the stone tool data to address various research topics, including settlement patterns, changes in procurement and use of local and extralocal chert resources, and changes in lithic technology over the course of the Paleoindian period (Ray 2003:ii). Aside from the collections of materials examined from the Little River Complex (Sanders 1983, 1988; Sanders and Maynard 1979; Yahnig 1986), this represents one of the most impressive datasets on Paleoindian settlement patterns and lithic technology from a circumscribed area in Kentucky, and perhaps the Southeast.

The Hall's Cave site (15Bu244) in Bullitt County, may contain an Early Paleoindian component (Wilson et al. 1983). This cave is situated on a bluff face along the lower end of Floyd's Fork. Unfortunately, the cave deposits have suffered considerable disturbance through looting activity. In 1983, however, a survey team from the University of Louisville documented the presence of faunal remains of several species, including those of extinct Pleistocene mastodon (*Mammut Americanum*) and seven other unidentified bones considered to be of Pleistocene age. Faunal remains of elk (*Cervus elaphus*) also were identified. Three heavily patinated chert unifaces were found in "loose" association with these remains. If the association can be verified, then the non-diagnostic unifaces would have be from an Early Paleoindian (perhaps pre-Clovis) toolkit, given the antiquity of the mastodon remains. Though circumstantial, this possible association of cultural materials with extinct faunal remains could be worthy of further investigation. As with other sites of similarly ambiguous association (e.g., Big Bone Lick [15Be18 and 15Be269-272], Adams Mastodon site [15Hr14], and Clay's Ferry Crevice site [15Fa163] in the Bluegrass Management Area), there is no clear evidence from a Kentucky site of Paleoindian hunting or butchering of Pleistocene megafauna.

Another Paleoindian site in this management area, the Danville Tank site (15Bo16), is situated on an elevated hilltop in the first range of hills that mark the transition from between the Outer Bluegrass and the Knobs. This range also divides the Salt and Kentucky River drainages. Test excavations resulted in the recovery of a Late Paleoindian Plano Complex projectile point from sub-plowzone context at 29 cm below surface in one test unit. Based on the results of this initial testing, the Danville Tank site was thought to perhaps represent an undisturbed, single component Late Paleoindian site (Niquette 1984). However, subsequent Phase III excavations revealed that 1) the Paleoindian occupation was ephemeral; 2) more intensive occupation occurred during the Late Archaic/Early Woodland period; and 3) the integrity of the deposits had been affected by the vertical displacement of cultural materials (Boedy and Niquette 1987:37).

Although the excavations failed to identify significant Paleoindian occupation at the Danville Tank site, another aspect of the research for this project did yield data on Paleoindian settlement in and around Boyle County. Much like Ray's (2003) project cited above, researchers conducted a Paleoindian projectile point survey by interviewing local collectors and amateur archaeologists (Boedy and Niquette 1987:10). This survey resulted in the documentation of 74 projectile points, including Clovis, Cumberland, Quad, unfluted Plano Complex, Folsom and lanceolate-shaped points that were fluted on one face only (Boedy and Niquette 1987:10). These points were found at 41 sites primarily located in Boyle and Lincoln counties, and to a lesser extent in Mercer, Garrard, Casey, Washington, Adair, Marion, and Clinton counties (Boedy and Niquette 1987:10). In addition to the Salt River Management Area, materials documented by Boedy and Niquette are located into the Bluegrass, Green River, and Upper Cumberland management areas.

UPPER CUMBERLAND MANAGEMENT AREA

Thirty-four Paleoindian sites have been recorded in the Upper Cumberland Management Area, with 30 being located in the Lake Cumberland Section and four being located in the Southeastern Mountains Section. Slightly more than half (n=18; 52.9 percent) of these sites have been recorded since 1987. Paleoindian sites in this management area are relatively equally distributed among terrace (n=7), floodplain (n=6), hillside (n=6), and undissected upland (n=6) settings, though slightly more are associated with dissected uplands (n=9) (Table 3.3).

Table 3.8. Upper Cumberland: Site Type by Management Area Section.

Site Type	Lake Cumberland	Southeastern Mountains	Total	Percent
Open Habitation w/out mound(s)	22	4	26	76.5
Rockshelter	4		4	11.8
Cave	3		3	8.8
Quarry	1		1	2.9
Total	30	4	34	100.0
Percent	88.2	11.8	100.0	

LAKE CUMBERLAND SECTION

Most of the Paleoindian sites in this section have been classified as open habitations without mound(s) (n=22 or 73.3 percent), though a few were identified as rockshelters (n=4 or 13.3 percent) or caves (n=3 or 10.0 percent). One of the more important Paleoindian sites in this section is the Wolfe Shelter (15Cu21), which yielded evidence of Early, Middle, and Late Paleoindian occupation (Lane et al. 1995). This is one of the few rockshelters that have been targeted in Kentucky and elsewhere in the Southeast to look for evidence of Paleoindian occupation (Lane et al. 1995). Though Paleoindian materials have been recovered from this site, research conducted to date has yet to recover these materials from intact deposits (Lane et al. 1995).

The Wolfe Shelter is part of a concentration of 10 Paleoindian sites in Cumberland County, four of which are part of the Alma Nation Site Complex. In addition, to the Wolfe Shelter, this complex consists of the Crawley Farmstead (15Cu43), Alma Nation (15Cu44), and Stella Cross (15Cu46) (Lane 1997). Occupation of these sites spanned the duration of the Paleoindian period based on the recovery of Early, Middle, and Late diagnostic projectile points. Many of these points are in private collections. A nearby site (15Cu74) yielded a Clovis projectile point (Lane and Shields 1997), and Lane reported documented four other Paleoindian sites (Sexton Fork [15Cu63], Owsley Farm [15Cu64], Lewis Creek [15Cu67], and Clint Carter [15Cu81]) in the vicinity of the Alma Nation Complex based on an examination of diagnostic projectile points in private collections (Lane 1995, 1996d, 1997a, 1997b; Lane and McBride 1997). An additional site (15Cu41) yielded a spurred endscraper, which is

similar to those that have been documented elsewhere as part of Paleoindian toolkits (Creasman 1993b).

Among these 10 sites, all are identified as open habitations without mound(s), with the exception of the Wolfe Shelter and Site 15Cu41, which is interpreted as being a quarry. Among the open habitation sites, three are located on floodplains (Owsley Farm, Lewis Creek, and Site 15Cu74), one is on a terrace (Site 15Cu81), and four are in dissected upland settings (Crawley Farmstead, Alma Nation, Stella Cross, and Sexton Fork). Though many of these sites have disturbed deposits or are poorly understood, it is clear that Cumberland County has a relatively high number of Paleoindian sites compared to other parts of the state. This is probably due to the fact that it has been the focus of more intensive research efforts, rather than an actual higher Paleoindian site density.

Another potentially important site in the Lake Cumberland Section is Site 15Wn71. This site is situated along a ridge on a terrace of Meadow Creek, and may contain evidence of a single component Late Paleoindian occupation. Among the materials collected, the only diagnostic was a Beaver Lake projectile point manufactured from St. Louis chert. The point and much of the remaining artifacts, consisting largely of lithic debitage and fire-cracked rock, were recovered from plowzone. Bybee (2003:71, 83), however, noted that the site had the potential to contain intact subplowzone deposits and intact features. Based on the results of the initial survey, this site was interpreted as a short-term campsite or extractive location (Bybee 2003:71).

Paleoindian materials also have been recovered from an upland site in McCreary County that was situated on an upland saddle between two sandstone ridges. Among the materials recovered from the surface of the Oil Well Branch Road site (15McY412), were unfluted Cumberland point, four Kirk corner-notched points, and a Kanawha stemmed point (Des Jean 1993). The presence of these points suggests the site was occupied during the Late Paleoindian/Early Archaic transition. This site may represent a short-term hunting camp (Des Jean 1993).

Tankersley (1990b:114) noted that the Great Rock Sink site (15Pu18), though heavily disturbed, may contain intact, stratified cultural deposits. This site is situated in a well-dissected karst upland near the Cumberland River. Great Rock Sink is a large sinkhole that forms a voluminous dry shelter. The potential for identifying Paleoindian deposits is based in part on the recovery of a heavily reworked Cumberland point, a Beaver Lake point base, and a unifacial knife (Tankersley 1990b:114) (Figure 3.4). Professional archaeological investigations, however, have yet to be conducted at this site.

SOUTHEASTERN MOUNTAINS SECTION

Only four Paleoindian sites have been recorded in the Southeastern Mountains Section, with all being located in Knox County and recorded before 1987 (Table 3.1). The only section with fewer Paleoindian sites is the Upper Big Sandy Section in the Big Sandy Management Area, where only two such sites have been recorded. All four of the Paleoindian sites in the Southeastern Mountains Section are open habitations without mound(s) (Table 3.8). None of these sites have been investigated. Turnbow and Allen's

(1977) report of fluted points from the surface of Site 15Kx5, however, suggests that ridgetops overlooking mountain gaps may contain early Paleoindian sites.

BLUEGRASS MANAGEMENT AREA

The Bluegrass Management Area has the third highest number of Paleoindian sites recorded in the state (n=71 or 19.4 percent), with most being documented before 1987 (n=54 or 76.1 percent) (Table 3.1). These sites tend to be located in dissected uplands (n=23 or 32.4 percent) and floodplains (n=18 or 25.4 percent).

This management area is distinguished from other regions in Kentucky by the high potential for fossilized remains of Pleistocene fauna, such as mammoth (*Mammuthus jeffersoni*), mastodon, ground sloth, moose/elk, caribou, and musk ox, to be documented in association with springs, sinkholes, and grikes, among other features common to the karst topography of the area. These topographic features also are known to be the loci of Paleoindian deposits. However, despite the efforts of several investigators (Boisvert 1984; Duffield and Boisvert 1983; Lowthert 1998; Tankersley 1985, 1989; Vesper and Tanner 1984; Walters 1988), none have yet to document unequivocal evidence of Paleoindian cultural materials in direct association with Pleistocene faunal remains. Certainly, however, the potential exists to identify such early intact kill sites or processing stations, perhaps at such locations as the Adams Mastodon site (15Hr14) and Clays Ferry Crevice site (15Fa163) in the Central Bluegrass Section, and Big Bone Lick (15Be18 and 15Be269-272) in the Northern Bluegrass Section (see below).

CENTRAL BLUEGRASS SECTION

Most of the Paleoindian sites in this management area have been recorded in the Central Bluegrass Section (n=49 or 69.0 percent) (Table 3.1). The majority of these sites were recorded before 1987 (n=37 or 75.5 percent), and all but four are identified as open habitations without mound(s) (Table 3.9). The single site identified as an open habitation with mound(s) (Site 15Js6) is a multicomponent site where Paleoindian use is indicated by a single Clovis projectile point that was reported by the owner. With a few notable exceptions (Boisvert 1984; Duffield and Boisvert 1983; Rolingson 1964; Vesper and Tanner 1984; Walters 1988), there have been few concerted efforts to investigate Paleoindian sites in this section.

There is a moderately dense concentration of Paleoindian sites in this section compared to other parts of the state (Figure 3.7). More Paleoindian sites have been recorded in Fayette County (n=10) than any other county in this section, or the rest of the Bluegrass Management Area. An additional 26 Paleoindian sites have been documented in nearby Clark (n=5), Madison (n=7), Jessamine (n=5), and Woodford (n=5) counties. These sites have been recorded during the course of multiple projects, with most sites represent by deflated open habitations located near small upland springs, such as the Bryan Station Springs site (l5Fa18) and the Upper Blue Springs site (l5Hr78). Fluted points have been recovered from the plowzone deposits immediately surrounding springs at both sites (Boisvert 1984; Rolingson 1964).

Table 3.9. Bluegrass: Site Type by Management Area Section.

Site Type	Central Bluegrass	Northern Bluegrass	Eastern Bluegrass	Total	Percent
Open Habitation w/out mound(s)	45	9	11	65	91.5
Workshop	1			1	1.4
Specialized Activity Site	2	2		4	5.6
Open Habitation w/ Mound(s)	1			1	1.4
Total	49	11	11	71	100.0
Percent	69.0	15.5	15.5	100.0	

There is a possibility that intact kill sites may occur in this section at small sinkhole ponds near springs, as suggested by materials recovered from the Adams Mastodon site (15Hr14) and at the Clay's Ferry Crevice site (15Fa163). The Adams Mastodon site is located near Cynthiana in Harrison County. The site consists of a small spring and shallow sinkhole pond situated on a low bedrock rise that overlooks the North Fork of the Licking River. Historically, the sinkhole has been used as a farm pond. Because of persistent subsurface drainage, steps were taken in 1982 to plug the sink. This resulted in the removal of the upper levels of a blue-gray lacustrine clay that contained the remains of at least one mastodon. The presence of large fossil bones in these deposits was not surprising, however, since the owner, Mr. Muff Adams, had exposed similar bone during prior attempts to seal the pond (Lathel Duffield, personal communication 1982). In October 1982, three weekends of excavation were conducted at the site by the University of Kentucky. The excavation was directed toward the recovery of the mastodon remains and taphonomic data (Duffield and Boisvert 1983; Walters 1988). These investigations suggested that the mastodon had been butchered, although the possibility of post-mortem scavenging was not ruled out. The presence of "cut marks" on certain bones and a "non-random pattern" of limestone slabs in direct association with the mastodon remains argued for an anthropogenic origin of the stones in the clay (Duffield and Boisvert 1983).

The Clays Ferry Crevice site is a fossiliferous grike located in Fayette County. The site is situated at the interface of the gently rolling karst upland with the narrow, deeply cut, and steep-sided gorge of the Kentucky River. This area has been subjected to extensive tectonic disturbances as evidenced by the faulted and folded Middle Ordovician strata that are exposed in the immediate vicinity of the site. The impact of the tectonic forces on the site's depositional history is unknown at this time.

The grike and proboscidean bones were initially exposed by the construction of Interstate 75; the extent of the deposits destroyed by this project is unknown. Subsequent damage to these deposits has been caused by erosion and by vandals. It is possible that a sinkhole pond may have existed above the grike during the Pleistocene. Unfortunately, the overlying surficial deposits have been partially graded, thereby masking the original topographic features of the site.

Since the grike was first exposed, proboscidean bones have been removed from the unconsolidated deposits by a few collectors. Most of these remains consist of limb bones. Dennis Vesper and Ray Tanner (1984:18) have suggested that the remains represent a single mammoth (*Mammuthus jeffersoni*). Two Clovis points manufactured from Upper Mercer chert were reported collected from the fossil-bearing deposits. Examination of slope wash by the Tankersley (1990b) revealed heavily weathered unidentifiable bone fragments, oxidized limestone, and a heat-altered endscraper. The stone tool is not temporally diagnostic. A radiocarbon assay of 6,680±310 B.C. was obtained from a bone sample collected from the site by Michael Gramly (Vesper and Tanner 1984:18). Since standard age determinations on bone samples of this antiquity commonly give anomalous dates, this date is not considered acceptable.

While the topographic and geologic characteristics of the Clays Ferry Crevice site would have made it an ideal location for an early Paleoindian group to dispatch a mammoth, Tankersley (1990b:117) noted that based on available data, a Clovis-mammoth association cannot be confirmed at this site. It is possible that Paleoindian materials found at this site were not contextually associated with fossil-bearing deposits. Karst features such as sinkholes and grikes are natural traps for a variety of animal species. Animal remains tend to accumulate over a long period of time in the colluvium of these features, which makes stratigraphic interpretations difficult. Besides self-entrapment, the remains of many species accumulate in these features as a result of carnivore or scavenger activities (Parmalee et al. 1978). Some portions of the deposits in the grike are probably intact and should be investigated in order to evaluate the site's integrity and to determine if the Paleoindian materials are contextually associated with Pleistocene fauna

One open habitation site that may be worth further investigation is the Snowden site (15Js116). This site, which is located on a ridge overlooking a sinkhole, was initially identified as part of a highway survey project (Fiegel 1994). The only diagnostic recovered was a Late Paleoindian Beaver Lake projectile point, which consists of distal and proximal fragments which were recovered from within a meter of each other and can be refitted at the hinge fracture (Fiegel 1994:18). Although the site deposits within the project boundaries were deflated, Fiegel (1994:18) proposed that deeper, intact deposits may exist east of the project boundaries. Given the presence of two refitting fragments of a Beaver Lake point, and Fiegel's observations about site deposits located outside the project boundary, it seems likely that intact deposits may, in fact, be identified at this site.

NORTHERN BLUEGRASS SECTION

Eleven Paleoindian sites have been identified in the Northern Bluegrass Section (Table 3.1), most of which are open habitations without mound(s) (n=9 or 81.2 percent) (Table 3.9). Two additional sites have been identified as special activity sites (Table 3.9). Paleoindian sites have not yet been recorded in six counties in this section (Campbell, Carroll, Grant, Kenton, Pendleton, and Trimble).

While paleontological and archaeological investigations· have been conducted at Big Bone Lick for almost 200 years, no systematic evaluation has ever been made of

Paleoindian sites in or adjacent to the park. Big Bone Lick (15Be18 and 15Be269-272) is located approximately 32 km southwest of Cincinnati, Ohio. Historically, this area is known for its salt springs, paleontological deposits, and the academic involvement of famous scientists including Benjamin Franklin, Thomas Jefferson, George Cuvier, and Charles Lyell (Jillson 1936).

During the early Woodfordian (ca. 23,000 B.C.), Big Bone Lick was the location of a large, slightly saline, back water lake that attracted large herbivores. Among the identified species are musk ox, caribou, ground sloth, moose/elk, and mammoth. By the late Woodfordian (ca. 10,500 B.C.), the lake was reduced to a backswamp area with several saline springs. This environment continued to attract large gregarious herbivores including mastodon, horse, and bison. There is evidence to suggest that by ca. 8,550 B.C., early Paleoindians hunted these species; Clovis cultural material and the remains of megafauna occur in the deposits surrounding the saline springs (Tankersley 1985b, 1989b).

Clovis material has been collected from the surface of Big Bone Lick's late Pleistocene deposits for more than 180 years by investigators, such as Dr. William Goforth (1803-1807), Herbert Schiefer (1898), J. D. Moore (1930s), Ellis Crawford (1959) and Kenneth Tankersley (1985b) (Figure 3.1). These artifacts were manufactured from high-quality nonlocal raw materials whose source areas are located more than a hundred kilometers from the site.

The possibility that stratified Clovis deposits may be present was first suggested by the University of Nebraska's paleontological excavations (1962-1966) when cultural material was recovered from fossiliferous strata (Schultz et al. 1967). Limited excavations by undertaken by Kenneth Tankersley in the early 1980s documented heavily patinated retouched flakes in direct association with spirally fractured Late Pleistocene large mammal long bones. Unfortunately these remains were recovered from a stratum comprised of secondary deposits (Tankersley 1985b:43, 1987). While it may be argued that discovered cultural material and megafauna are contemporary, an *in situ* association has not been confirmed. In addition to these materials, possible chert artifacts were recovered in association with megafauna from cores drilled for a view stand at Site 15Be269 (Carl Shields, personal communication 2007).

EASTERN BLUEGRASS SECTION

Just over 15 percent of the Paleoindian sites in the Bluegrass Management Area are located in the Eastern Bluegrass Section (n=11 or 15.5 percent), all of which are open habitations without mound(s) (tables 3.1 and 3.9). Robertson County is the only county in this section for which no Paleoindian sites have been recorded. Given the number of saline springs in this section, however, there is a potential to record more Paleoindian sites, such as the Upper Blue Springs site (15Hr78) and Lower Blue Licks site (15Ni2).

UPPER KENTUCKY/LICKING MANAGEMENT AREA

Fewer Paleoindian sites have been documented in the Upper Kentucky/Licking Management Area than anywhere else in the state (n=12 or 3.3 percent) (Table 3.1). Almost sixty percent of these sites were recorded before 1987 (n=7 or 58.3 percent). More Paleoindian sites are located in floodplain settings (n=4 or 33.3 percent) than any other landform in this management area, with the remaining sites being located in hillside (n=3), terrace (n=2), dissected upland (n=2), and undissected upland settings (n=1) (Table 3.3). Although the total number of Paleoindian sites in this management area is low (n=12), it has more rockshelter sites from this period (n=5) than any other area of the state (Table 3.2). Few projects have specifically targeted Paleoindian research sites in the Upper Kentucky/Licking Management Area, and those that have were completed before 1990 (e.g., Bush 1988; Rolingson 1964). With additional research, it is likely that more Paleoindian sites will be identified in this management area, particularly if deeper intact deposits within protected rockshelters are investigated.

Table 3.10. Upper Kentucky/Licking: Site Type by Management Area.

Site Type	Gorge	Interior Mountains	Total	Percent
Open Habitation w/out mound(s)	4	2	6	50.0
Rockshelter	2	3	5	41.7
Mound Complex	1		1	8.3
Total	7	5	12	100.0
Percent	58.3	41.7	100.0	

GORGE SECTION

Slightly more Paleoindian sites are located in the Gorge Section (n=7 or 58.3 percent) than in the Interior Mountains Section (n=5 or 41.7 percent). Four of these sites are identified as open habitations without mound(s), while two are rockshelters (Table 3.10). At the mound complex site (15Po3), which has a Paleoindian component represented by an isolated artifact, the mounds are actually associated with later occupation of the site. There are four counties (Estill, Lee, Rowan, and Wolfe) in this section where Paleoindian sites have yet to be recorded.

INTERIOR MOUNTAINS SECTION

The few Paleoindian sites in the Interior Mountains Section are classified as open habitations without mound(s) (n=2 or 40.0 percent) and rockshelters (n=3 or 60.0 percent). Five counties in this section do not yet have any identified Paleoindian sites

(Jackson, Knott, Leslie, Letcher, and Rockcastle). Though few Paleoindian sites have been documented in this section, limited excavation of the Enoch Fork Rockshelter (15Pe50) documented the presence of a Paleoindian component at this site.

The Enoch Fork Rockshelter is fairly typical of rockshelters in Perry County. The surface area is small (12.5 x 8.5 m), partly wet, and covered with breakdown. A small portion of the site has been impacted by vandals. Bush (1987) describes and illustrates a small projectile point, similar to what has been called Wheeler, recovered at a depth of 68 cm below the surface and below Early Archaic materials. A radiometric assay of 9,010±240 B.C. that was obtained from deposits associated with a retouched blade (Bush 1988:60-61). This date and the associated blade were recovered from deposits stratigraphically below a Late Paleoindian lanceolate point, suggesting that this site may represent one the best examples of Early Paleoindian cave/shelter use in Kentucky. However, it is equally likely that the Enoch Fork deposits represent a Middle Paleoindian occupation (Evans 1995).

BIG SANDY MANAGEMENT AREA

Relatively few Paleoindian sites have been recorded in the Big Sandy Management Area (n=15 or 4.1 percent); only the Upper Kentucky/Licking Management Area has fewer (n=12 or 3.3 percent). All but one of these sites was reported before 1987. All of the Paleoindian sites in this management area have been identified as open habitations without mound(s) (Table 3.11). Most of the sites are located in floodplain settings (n=12 or 80.0 percent) with the remaining sites being located on terrace landforms (n=3 or 20.0 percent).

Table 3. 11. Big Sandy: Site Type by Management Area Section.

Site Type	Lower Big Sandy	Upper Big Sandy	Total	Percent
Open Habitation w/out mound(s)	13	2	15	100.0
Total	13	2	15	100.0
Percent	86.7	13.3	100.0	

As with the Upper Kentucky/Licking Management Area, this region is noted for its rugged terrain and abundant rockshelter formations, many of which contain evidence of prehistoric occupation (see chapters 4 and 5). To date none of the rockshelters in this management area have yielded evidence of Paleoindian occupation. It is, nonetheless, possible that such evidence exists, but simply has not yet been detected because it is either deeply buried or has been removed by looters. In addition, few projects have focused specifically on Paleoindian research in this management area. Systematic surveys and additional collector interviews of both the Lower and Upper Big Sandy sections should be conducted to determine whether the paucity of Paleoindian sites is based on a real pattern.

LOWER BIG SANDY SECTION

All of the known Paleoindian sites in the Lower Big Sandy Section were recorded before 1987. Within this section, no Paleoindian sites have been recorded in Carter, Elliott, or Martin County. One site worth noting is the Mayo site (15Jo14). Although the deposits are disturbed, as evidenced by the recovery of a Clovis and two Dalton projectile points from a Fort Ancient midden (Rolingson 1964), it is considered significant. No other site in this section has yielded as many Paleoindian diagnostics, much less from the Early and Late subperiods. The Mayo site is situated in the rugged, mountainous, cliff-lined valley of Paint Creek. Abundant, high-quality lithic material does not occur in the immediate vicinity of this site.

UPPER BIG SANDY SECTION

The Upper Big Sandy Section has fewer Paleoindian sites than any other section in the state (n=2 or 0.5 percent). Both of these sites are located in Pike County. The only Paleoindian site recorded since 1987 is represented by a proximal fragment of a Cumberland point, which was recovered from Cowpen Creek site (15Pi96) in Pike County (Baltz 1995).

PALEOINDIAN RESEARCH OBJECTIVES

The research objectives presented below for the Paleoindian period in Kentucky reflect cultural historical problems currently facing scholars of eastern North American prehistory. Some of these issues have concerned investigators since the beginning of archaeological research in the United States. Because of the long history of research into the Paleoindian period, the research objectives presented below draw heavily on the work of other archaeologists including Ronald Mason (1962), Martha Rolingson (1964), Douglas Schwartz (1967), John Walthall (1980), C. Vance Haynes (1982), Mark Seeman and Olaf Prufer (1982), George MacDonald (1983), William Gardner (1983), Gordon Willey (1985), Patrick Munson (1985), William Ritchie (1985), David Anderson (1990), Edward Smith (1990), Kenneth Tankersley (1990a, 1990b, 1996), Kenneth Tankersley and Barry Isaac (1990), and Jack Ray (1998, 1999, 2003).

1. CLASSIFICATION AND CULTURAL HISTORY

* Determine when early Paleoindian peoples arrived in Kentucky and the geographical extent of their occupation.
* Identify the locus of the origin of the early Paleoindian inhabitants of Kentucky.
* Determine how many Paleoindian cultures or industries (e.g., Clovis, Cumberland, Plano, and Dalton) are present in Kentucky.
* Determine the temporal parameters of Paleoindian cultures and assess their degree of contemporaneity.
* Identify and evaluate the significance of the Middle and Late Paleoindian assemblages in Kentucky and document their distribution.
* Determine which Paleoindian cultures migrated into Kentucky, and which Paleoindian cultures may represent indigenous developments.
* Understand the social, economic, and technological relationships among Paleoindian cultures of Kentucky and within the broader regional context of eastern North America.

2. MATERIAL CULTURE AND TECHNOLOGY

* Refine the known distribution of different Paleoindian projectile point types.
* Document tools, other than projectile points, that constitute Paleoindian toolkits.

* Identify Paleoindian raw material procurement locations and exploitation strategies.
* Determine the activities associated with the implements of Paleoindian toolkits (e.g., lithic use-wear analysis and microfossil residue analysis). Identify specialized technologies associated with unique cultural adaptations to certain paleoenvironments.
* Reconstruct the stages of manufacture for each element of the Paleoindian tool kit and document variations among Kentucky industries and those found elsewhere in the eastern United States.
* Identify Paleoindian raw material procurement locations and exploitation strategies.

3. SUBSISTENCE PATTERNS

* Obtain, where possible, a comprehensive paleoecological database for every physiographic region in Kentucky, including pollen sequences, as well as macro and micro vertebrate and invertebrate fossil assemblages.
* Establish a diachronic paleoenvironmental reconstruction, model, or biogeography of the predominant plant communities during the Paleoindian period, and evaluate the carrying capacity of each region.
* Establish the subsistence patterns of the Early, Middle, and Late Paleoindian subperiods within the different physiographic zones of the state, and understand those patterns in the context of changing environmental conditions that accompanied the Pleistocene/Holocene transition.
* Determine which Late Pleistocene faunal species, including megafauna, were contemporary with the different Paleoindian cultures in Kentucky.
* Document any changes and consistencies in subsistence strategies employed by Paleoindians of the Late Pleistocene and Archaic foragers of the Early Holocene.

4. SETTLEMENT PATTERNS

* Identify Paleoindian site location and regional distribution patterns.
* Undertake a survey of public and private collections to obtain data on the spatial distribution and characteristics of Kentucky Paleoindian artifacts.
* Document and describe the differences between Paleoindian sites, and attempt to determine the range of different site types that constituted regional settlement systems.

* Understand the patterns of initial migration and subsequent occupation of different regions of Kentucky.
* Assess the mobility patterns and settlement strategies of Early, Middle, and Late Paleoindian populations.
* Determine how Paleoindian settlement strategies may have articulated with changes in economic and technological organization, and the availability of natural and social resources.

5. EXCHANGE SYSTEMS

* Determine the extent to which nonlocal resources are represented in Paleoindian assemblages.
* Determine if the use of nonlocal resources by Paleoindian cultures represents exchange, overlapping territories, or highly-mobile foraging. If these nonlocal resources represent exchange, identify by what means those resources moved across the landscape, and what that implies about social interaction.

6. BIOANTHROPOLOGY

* Locate Paleoindian skeletal material.
* Describe Paleoindian skeletal material morphologically and metrically.
* Investigate biological distance between Kentucky Paleoindian populations and suggested source populations.
* Establish demographic and genetic profiles of Paleoindian populations.
* Apply stable isotope biochemistry and dental studies to reconstruct Paleoindian paleodiets.

7. MORTUARY PRACTICES

* Determine if Paleoindian remains were buried, cremated, or left exposed to the elements and if there is any evidence for preferential treatment by age or sex.

8. SOCIAL ORGANIZATION

* Identify contemporary Paleoindian sites. Determine how they may have been interrelated within a social system.
* Construct hypotheses concerning size, composition, and functions of social groups and the interactions among these groups. Test these hypotheses by investigating correlations among contemporaneous sites, such as intra- and inter-site spatial organization, economic activities, technology, and artifact styles.

9. IDEOLOGY

* Define the elements associated with Paleoindian ideology.
* Compare these ideological elements to those identified in contemporaneous Paleoindian populations elsewhere in North America, and in antecedent and subsequent cultures (i.e., Old World Upper Paleolithic and Midcontinent Early Archaic).

MAJOR ACCOMPLISHMENTS

Over the past 20 years, Paleoindian research in Kentucky has advanced primarily in terms of the increased number of sites that have been documented. With some notable exceptions (e.g., Creasman 1993; Lane et al. 1995; Ray 1998, 1999, 2003), very little new research has been conducted on Paleoindian sites during that time. However, the work that has been undertaken is consistent with archaeological studies conducted in other areas. This work has resulted in the recognition that the colonization of the Americas occurred earlier than previously thought and that it is quite likely that there are sites in Kentucky that predate Clovis. Based on the work that has been undertaken, it is evident that no one model can currently explain the process of colonization of Kentucky and the regionalization that followed. As people settled into Kentucky's diverse landscape during the Late Pleistocene and Early Holocene, they adapted to circumscribed localities and their corresponding natural resources. The challenge that lies ahead for Kentucky archaeology is to gather data that will address the various research objectives identified above, and to better understand Paleoindian populations who occupied this state in broader regional perspective.

REFERENCES CITED

Adovasio, James M. (compiler)
1982 *The Prehistory of the Paintsville Reservoir, Johnson, and Morgan Counties, Kentucky*. Ethnology Monographs No. 6. Department of Anthropology, University of Pittsburgh, Pittsburgh.

Adovasio, James M., Jack Donahue, and Robert Stuckenrath
1990 The Meadowcroft Rockshelter Radiocarbon Chronology 1975-1990. *American Antiquity* 55:348-354.

Adovasio, James M., Joel D. Gunn, Jack Donahue, Robert Stuckenrath, John E. Guilday, and K. Volman
1980 Yes Virginia, It Really Is That Old: A Reply to Haynes and Mead. *American Antiquity* 45:588-595.

Adovasio, James M., and David R. Pedler
2004 Pre-Clovis Sites and Their Implications for Human Occupations before the Last Glacial Maximum. In *Entering America: Northeast Asia and Beringia Before the Last Glacial Maximum*, edited by David B. Madsen, pp. 139-158. University of Utah Press, Salt Lake City.

Adovasio, James M., David R. Pedler, Jack, Donahue, and Robert Stuckenrath
1999 No Vestige of a Beginning nor Prospect for an End: Two Decades of Debate on Meadowcroft. In *Ice Age Peoples of North America: Environments, Origins, and Adaptations*, edited by Robson Bonnichsen and Karen L. Turnmire, pp. 416-431. Center for the Study of the First Americans, Department of Anthropology, Texas A&M University Press, College Station.

Ames, Kenneth M.
1988 Early Holocene Forager Mobility Strategies on the Southern Columbia Plateau. In *Early Human Occupation in Far Western North America: The Clovis-Archaic Interface*, edited by Judith Willig, C. Melvin Aikens, and John L. Fagan, pp. 325-360. Nevada State Museum Anthropology Papers No. 21, Carson City.

Anderson, David G.
1990 The Paleoindian Colonization of Eastern North America. In *Early Paleoindian Economies of Eastern North America*, edited by Kenneth B. Tankersley and Barry L. Isaac. Research in Economic Anthropology, Supplement 5, JAI Press.

1996 Models of Paleoindian and Early Archaic Settlement. In *The Paleo-Indian and Archaic Southeast*, edited by David Anderson and Kenneth Sassaman, pp. 29-57. University of Alabama Press, Tuscaloosa.

Anderson, David G., and J. Christopher Gillam
2000 Paleoindian Colonization of the Americas: Implications from an Examination of Physiography, Demography, and Artifact Distribution. *American Antiquity* 65:43-66.

Anderson, David G., Lisa D. O'Steen, and Kenneth E. Sassaman
1996 Environmental and Chronological Considerations. In *The Paleo-Indian and Archaic Southeast*, edited by David Anderson and Kenneth Sassaman, pp. 3-15. University of Alabama Press, Tuscaloosa.

Allen, Roger C., and C. Wesley Cowan
1976 *Test Excavations at the American Smelting and Refining Corporation Kentucky Refining Plant, Breckinridge County, Kentucky*. Ohio Valley Archaeological Research Associates, Lexington.

Allen, Roger C., and John T. Griffin
1978 *An Archaeological Survey of a Proposed Industrial Park in Pulaski County, Kentucky*. Archaeological Services of Kentucky, Lexington.

Alvey, Richard L., Jack M. Schock, Terry L. Weis, and Gary S. Foster
1976 *An Archaeological Survey of the Proposed Relocation of U.S. 641 in Calloway and Marshall Counties. Kentucky*. Western Kentucky University, Bowling Green.

Autry, William O., Larry R. Kimball, and Glyn D. DuVall
1989 *Archaeological and Geomorphological Investigations in Selected Bends along the Lower Cumberland River, Livingston, Crittenden, and Lyon Counties, Kentucky*. DuVall and Associates. Nashville, Tennessee.

Baltz, Christopher
1995 Site 15Pi96, site inventory form. On file, Office of State Archaeology, University of Kentucky, Lexington.

Baltz, Christopher, J. Orloff, G. Miller, and E. Jeanne Harris
1998 *Report on the 1998 Field Season: A Phase I Archaeological Field Reconnaissance of the Green River Lake Shoreline Fluctuation Zone in Adair and Taylor Counties*. Gray & Pape, Cincinnati, Ohio.

Bamforth, Douglas B.
1991 Technological Organization and Hunter-Gatherer Land Use: A California Example. *American Antiquity* 56:216-234.

Bar-Yosef, Ofer, and Francois R. Valla
1991 The Natufian Culture—An Introduction. In *The Natufian Culture in the Levant*, edited by Ofer Bar-Yosef and Francois R. Valla, pp. 1-10. International Monographs in Prehistory, Ann Arbor.

Beaton, J. M.
1991 Colonizing Continents: Some Problems from Australia and the Americas. In *The First Americans: Search and Research*, edited by Tom D. Dillehay and David J. Meltzer, pp. 209-230. CRC Press, Baton Rouge, Louisiana.

Beck, Charlotte., and George T. Jones
1997 The Terminal Pleistocene/Early Holocene Archaeology of the Great Basin. Journal of World Prehistory 11:161-236.

Beardsley, R. K., Preston Holder, Alex D. Krieger, Betty J. Meggers, John B. Renaldo, and Paul Kutsche
1956 Functional and Evolutionary Implications of Community Patterning. In *Seminars in Archaeology: 11955*, edited by Robert Wauchope, pp. 130-157. Society for American Archaeology, Memoir No. 1.

Bettinger, Robert L., and David A. Young
2004 Hunter-Gatherer Population Expansion in North Asia and the New World. In *Entering America: Northeast Asia and Beringia Before the Last Glacial Maximum,* edited by David B. Madsen, pp. 239-251. University of Utah Press, Salt Lake City.

Bell, Bobby G.
1982 The Holmes Site Complex in Graves County, Kentucky. *Kentucky Archaeological Association Bulletin* 18/19:3-15.

Binford, Lewis R.
1979 Organization and Formation Processes: Looking at Curated Technologies. *Journal of Anthropological Research* 35:255-273.

1980 Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45:4-20.

Boedy, Randall D.
1983 *Archaeological Mitigation of 15Ca4 and Testing of 15Ca51 in the Corridor of the Improvements to the Wastewater Treatment Facility of the City of Princeton, Caldwell County, Kentucky*. Department of Sociology and Anthropology, Murray State University, Murray, Kentucky.

Boedy, Randall D., and Charles M. Niquette
1987 *A Phase III Archaeological Examination of the Danville Tank Site (15BO16), Boyle County, Kentucky*. Cultural Resource Analysts, Lexington.

Boisvert, Richard A.
1984 *Kentucky Salt Licks: A Preservation Perspective.* Office of State Archaeology, University of Kentucky, Lexington.

Boldurian, Anthony T., and John L. Cotter
1999 *Clovis Revisited: New Perspectives on Paleoindian Adaptations from Blackwater Draw, New Mexico*. The University Museum, University of Pennsylvania, Philadelphia.

Bonnichsen, Robson, and Alan L. Schneider
1999 Breaking the Impasse on the Peopling of the Americas. In *Ice Age Peoples of North America: Environments, Origins, and Adaptations*, edited by Robson Bonnichsen and Karen L. Turnmire, pp. 497-519. Center for the Study of the First Americans, Department of Anthropology, Texas A&M University Press, College Station.

Bonnichsen, Robson, and Karen L. Turnmire
1999 An Introduction to the Peopling of the Americas. In *Ice Age Peoples of North America: Environments, Origins, and Adaptations*, edited by Robson Bonnichsen and Karen L.

Turnmire, pp. 1-26. Center for the Study of the First Americans, Department of Anthropology, Texas A&M University Press, College Station.

Borrero, Luis Alberto
2006 Paleoindians without Mammoths and Archaeologists without Projectile Points? The Archaeology of the First Inhabitants of the Americas. In *Paleoindian Archaeology: A Hemispheric Perspective*, edited by Juliet E. Morrow and Cristóbal Gnecco, pp. 9-20. University Press of Florida, Gainesville.

Breitburg, Emmanuel, John B. Broster, Arthur L. Reesman, and Richard G. Stearns
1996 The Coats-Hines Site: Tennessee's First Paleoindian-Mastodon Association. *Current Research in the Pleistocene* 13:6-7.

Briceño, Jesus
1999 Quebrada Santa Maria: Las Puntas en Cola de Pescado y la Antigüedad del Hombre en Sudamerica. In *El Periodo Arcaico en el Perú: Hacia una definición del los orígenes.* Boletin de Arqueologia PUCP, N^{o} 3, pp. 19-39. Departamento de Humanidades, Pontificia Universidad Catolica del Peru. Lima.

Brooks, Robert L.
1981 The Subdivision Project: An Analysis of Archaeological Resources in the South Lexington Vicinity, Fayette County, Kentucky. Ms. on file, Office of State Archaeology, University of Kentucky, Lexington.

Broster, John B., and Mark R. Norton
1993 The Carson-Conn-Short Site (40BN190): An Extensive Clovis Habitation in Benton County, Tennessee. *Current Research in the Pleistocene* 10:3-5.

1996 Recent Paleoindian Research in Tennessee. In *The Paleoindian and Early Archaic Southeast*, edited by David G. Anderson and Kenneth E. Sassaman, pp. 288-297. University of Alabama Press, Tuscaloosa.

Brown, James A., and Charles Cleland
1968 The Late Glacial and Early Post Glacial Faunal Resources in Midwestern Biomes Newly Opened to Human Adaptation. In *The Quaternary of Illinois*, edited by Robert E. Bergstrom, pp. 114-122. Illinois Geological Survey, Springfield.

Bryan, Alan L.
1973 Paleoenvironments and Cultural Diversity in Late Pleistocene South America. *Quaternary* 3: 237-256.

1991 The Fluted-Point Tradition in the Americas: One of Several Adaptations to Late Pleistocene American Environments. In *Clovis Origins and Adaptations*, edited by Robson Bonnichsen and Karen L. Turnmire, pp. 15-34. Center for the Study of the First Americans, Oregon State University, Corvallis

2004 The Search for the First Americans: Perspectives and Prospects. In *New Perspectives on the First Americans*, edited by Bradley T. Lepper and Robson Bonnichsen, pp. 215-222. Center for the Study of the First Americans, Texas A&M University Press, College Station.

Bryan, Alan L., Rodolfo M. Casamiquela, Jose M. Cruxent, Ruth Gruhn, and Claudio Ochsenius
1978 An El Jobo Mastodon Kill at Taima-Taima, Venezuela. *Science* 200:1275-1277.

Bryan, Alan L., and Ruth Gruhn
2003 Some Difficulties in Modeling the Original Peopling of the Americas. *Quaternary International* 109-110:175-179.

Bush, David R.
1988 New Evidence of Paleo-Indian and Archaic Occupations in Cay and Perry Counties, Kentucky. In *Paleoindian and Archaic Research in Kentucky*, edited by Charles D. Hockensmith, David Pollack, and Thomas N. Sanders, pp. 47-66. Kentucky Heritage Council, Frankfort.

Butler, B. Robert
1963 An Early Man Site at Big Camas Prairie, Southcentral Idaho. *Tebiwa* 6:22-33.

Bybee, Alexandra D.
2003 *An Archaeological Survey of the Proposed Wetland Banking Site Project in Wayne County, Kentucky*. Cultural Resource Analysts, Lexington, Kentucky.

Cambron, James W., and David C. Hulse
1960 An Excavation at the Quad Site. *Tennessee Archaeologist* 16(1):14-26.

Cannon, Michael D., and David J. Meltzer
2004 Early Paleoindian Foraging: Examining the Faunal Evidence for Large Mammal Specialization and Regional Variability in Prey Choice. *Quaternary Science Reviews* 23:1955-1987.

Carpenter, James C., and Kandis K. Jenings
1979 *Phase I Archaeological Reconnaissance of the Aurora Sanitation District No. 1, Wastewater Sewage Treatment System, Marshall County, Kentucky*. Department of Sociology and Anthropology, Murray State University, Murray, Kentucky.

Carstens, Kenneth C.
1979 *An Archaeological Survey and Testing of the Proposed 641 Road Realignment, Marshall County, Kentucky*. Department of Sociology and Anthropology, Murray State University, Murray, Kentucky.

1980 *Archaeological Investigations in the Central Kentucky Karst*. Unpublished Ph.D. dissertation, Department of Anthropology, Washington University, St. Louis.

Carr, Lucian and N. S. Shaler
1876 On the Prehistoric Remains of Kentucky. *Memoirs of the Kentucky Geological Survey* Vol. 1. Pt. 4.

Claggett, Stephen R., and J. Ned Woodall
1976 An Archaeological Survey of Bernheim Forest, Bullitt and Nelson Counties, Kentucky. Ms. on file, Office of State Archaeology, University of Kentucky, Lexington.

Cleland, Charles Edward
1965 Barren Ground Caribou *(Rangifer arcticus)* From an Early Man Site in Southeastern Michigan. *American Antiquity* 30(3):350-351.

Cohen, Mark Nathan
1977 *The Food Crisis in Prehistory*. Yale University Press, New Haven.

Collins, Michael B.
1999 *Clovis Blade Technology*. University of Texas Press, Austin.

2007 Discerning Clovis Subsistence from Stone Artifacts and Site Distributions on the Southern Plains Periphery. In *Foragers of the Terminal Pleistocene in North America*, edited by Renee B. Walker and Boyce N. Driskell, pp. 59-87. University of Nebraska Press, Lincoln.

Collins, Michael B. (editor)
1979 *Excavations at Four Archaic Sites in the Lower Ohio Valley, Jefferson County, Kentucky*. Occasional Papers in Anthropology No. 1. Department of Anthropology, University of Kentucky, Lexington.

Correal Urrego, G.
1981 *Evidencias Culturales y Megafauna Pleistocenica en Colombia*. Banco de la Republica, Bogota.

1986 Apuntes sobre el medio ambiente Pleistocenico y el hombre prehistorico en Colombia. In *New Evidence for the Pleistocene Peopling of the Americas*, edited by Alan L. Bryan, pp. 115-131. Center for the Study of the First Americans, Orono.

Cox, Steven L.
1972 A Re-analysis of the Shoop Site. Ms. on file, Smithsonian Institution, Washington, D.C.

Creasman, Steven D.
1993a *A Phase II National Register Evaluation of the Clark Site (15Da32) and the Abe Carter Site (15Da33) in the Proposed Owensboro-Daviess Industrial Park, Daviess County, Kentucky*. Cultural Resource Analysts, Lexington, Kentucky.

1993b *An Archaeological Survey of the Proposed Realignment of Kentucky Highway 61, Burkesville-Columbia in Adair, Cumberland, and Metcalfe Counties, Kentucky*. Cultural Resource Analysts, Lexington, Kentucky.

Curran, Mary Lou
1984 The Wipple Site and Paleoindian Tool Assemblage Variation: A Comparison and lntrasite Structuring. *Archaeology of Eastern North America* 12.

Custer, Jay F., and David C. Bachman
1986 Prehistoric Use of Basin/Bay Features on the Delmarva Peninsula. *Southeast Journal of Archaeology* 5(1):1-10.

Custer, Jay F., John A. Cavallo, and R. Michael Stewart
1983 Lithic Procurement and Paleo-Indian Settlement Patterns on the Middle Atlantic Coastal Plain. *North American Archaeologist* 4(4):263-276.

Custer, Jay F., and Edith B. Wallace
1982 Patterns of Resource Distribution and Archaeological Settlement Patterns in the Piedmont Uplands of the Middle Atlantic Region. *North American Archaeologist* 3(2):139-172.

Davis, Daniel B.
1999 *A Phase I Archaeological Survey of a 27.5-Acre Tract for a Proposed Campground and Associated Facilities at Nolin Lake State Park, Edmonson County, Kentucky*. Archaeological Report No. 428. Program for Archaeological Research, Department of Anthropology, University of Kentucky, Lexington, Kentucky.

DeJarnette, David L., Edward B. Kurjack, and Bennie C. Keel
1962 Stanfield- Worley Bluff Shelter Excavations. *Journal of Alabama Archaeology* 8(1-2):1-124.

Delcourt, Paul A., and Hazel R. Delcourt
1981 Vegetation Maps for Eastern North America: 40,000 Years B.P. to Present. In *Geobotany: An Integrating Experience*, edited by R. Romans, pp. 123-166. Plenum Press, New York.

Deller, D. Brian
1989 Interpretation of Chert Type Variation in Paleoindian Industries, Southwestern Ontario. In *Eastern Paleoindian Lithic Resource Use*, edited by Chris J. Ellis and Johnathon C. Lothrop, pp. 191-220. Westview, Boulder.

Deller, D. Brian, and Chris J. Ellis
1988 Early Palaeo-Indian Complexes in Southwestern Ontario. In *Late Pleistocene and Early Holocene Paleoecology and Archaeology of the Eastern Great Lakes Region*, edited by Richard S. Laub, Norton G. Miller, and David W. Steadman, pp. 251-263. Bulletin of the Buffalo Society of Natural Sciences 33, New York.

Deller, D. Brian, and Chris J. Ellis
1984 Crowfield: A Preliminary Report on a Probable Paleoindian Cremation in Southwestern Ontario. *Archaeology of Eastern North America* 12:41-71.

Des Jean, Tom
1993 *Oil Well Branch Road: A Transitional Archaic-Woodland Period Site at Big South Fork National River and Recreation Area: Report of Excavations, 1993*. Big South Fork National River and Recreation Area. Oneida, Tennessee.

Dillehay, Tom D.
1989 *Monte Verde: A Late Pleistocene Settlement in Chile, Volume I: Paleoenvironment and Site Context*. Smithsonian Institution Press, Washington, D. C.

1997 *Monte Verde: A Late Pleistocene Settlement in Chile*, *Volume II: The Archaeological Context*. Smithsonian Institution Press, Washington, D.C.

1999 The Late Pleistocene Cultures of South America. *Evolutionary Anthropology* 7(6):206-216.

2000 *The Settlement of the Americas: A New Prehistory*. Basic Books, New York.

Dillehay, Tom D., Gerardo Ardila Calderon, Gustavo G. Politis, and Maria da Conceicao de Moraes Coutinho Beltrâo
1992 Earliest Hunters and Gatherers of South America. *Journal of World Prehistory* 6:145-204.

Dincauze, Dena F.
1993 Fluted Points in the Eastern Forests. In *From Kostenki to Clovis: Upper Paleolithic—Paleo-Indian Adaptations*, edited by Olga Soffer and N. D. Praslov, pp. 279-292. Plenum Press, New York.

Dixon, E. James
1999 *Bones, Boats, and Bison: Archaeology and the First Colonization of Western North America*. University of New Mexico Press, Albuquerque, New Mexico.

Dragoo, Donald W.
1973 Wells Creek--An Early Man Site in Stewart County, Tennessee. *Archaeology of Eastern North America* 1(1):1-56.

1976 Some Aspects of Eastern North American Prehistory: A Review 1975. *American Antiquity* 41:3-27.

Driskell, Boyce N., Cynthia E. Jobe, Christopher A. Turnbow, and Mary E. Dunn
1984 *The Archaeology of Taylorsville Lake: Archaeological Data Recovery and Synthesis*. Archaeological Report No. 85. Department of Anthropology, University of Kentucky. Lexington.

Duffield, Lathel F., and Richard A. Boisvert
1983 The Adams Mastodon Site. Paper Presented at the 48th Annual Meeting of the Society for American Archaeology, Pittsburgh.

Dunbar, James S., and S. David Webb
1996 Bone and Ivory Tools from Submerged Paleoindian Sites in Florida. In *The Paleo-Indian and Early Archaic Southeast*, edited by David Anderson and Kenneth Sassaman, pp. 331-353. University of Alabama Press, Tuscaloosa.

Erlandson, Jon M.
1994 *Early Hunter-Gatherers of the California Coast*. Plenum Press, New York.

Erlandson, Jon M., and Madonna L. Moss
1996 The Pleistocene-Holocene Transition along the Pacific Coast of North America. In *Humans at the End of the Ice Age: The Archaeology of the Pleistocene-Holocene Transition*, edited by Lawrence Guy Straus, Berit Valentin Eriksen, Jon M. Erlandson and David R. Yesner, pp. 277-302. Plenum Press, New York.

Evans, John B.
1995 *Raw Material Procurement and Lithic Technology at Enoch Fork Shelter (15Pe50), Kentucky*. Unpublished Master's thesis, Department of Anthropology, University of Kentucky, Lexington.

Ferring, C. Reid
1989 The Aubrey Clovis Site: A Paleoindian Locality in the Upper Trinity River Basin, Texas. *Current Research in the Pleistocene* 6:9-11.

1990 The 1989 Investigations at the Aubrey Clovis Site, Texas. *Current Research in the Pleistocene* 7:10-12.

Fiedel, Stuart J.
1999 Older than We Thought: Implications of Corrected Dates for Paleoindians. *American Antiquity* 64(1):95-116.

2000 The Peopling of the New World: Present Evidence, New Theories, and Future Directions. *Journal of Archaeological Research* 8(1):39-103.

2002 Initial Human Colonization of the Americas: An Overview of the Issues and the Evidence. *Radiocarbon* 44(2):407-436.

2006 Points in Time: Establishing a Precise Hemispheric Chronology for Paleoindian Migrations. In *Paleoindian Archaeology: A Hemispheric Perspective*, edited by Juliet E. Morrow and Cristóbal Gnecco, pp. 21-43. University Press of Florida, Gainesville.

Fiegel, Kurt H.
1994 *A Report of an Archaeological Survey of the Proposed Rerouting of the Intersection of KY 29 and US 68 Near Wilmore, Jessamine County, Kentucky*. Kentucky Department of Transportation, Frankfort.

Figgins, Jesse D.
1927 The Antiquity of Man in America. *Natural History* 27(3):229-239.

Flanagan, John B.
1970 Archaeological Site Inventory Form, 15Ru300 and 15Ru301. Ms. on File, Office of State Archaeology, University of Kentucky, Lexington.

Foster, Gary S.
1972 An Archaeological Survey of Gasper River Drainage, Logan and Warren Counties, Kentucky. Ms. on file, Western Kentucky University, Bowling Green.

Foster, Gary S., and Jack M. Schock
1976 *An Archaeological Survey of the Proposed Relocation of Kentucky 461, Pulaski and Rockcastle Counties, Kentucky*. Western Kentucky University, Bowling Green.

Freeman, Andrea K. L., and Edward E. Smith
1992 Geoarchaeological Investigations in the Vicinity of the Little River Paleoindian Site Complex: 1991 Season. *Current Research in the Pleistocene* 9:121-122.

Freeman, Andrea K. L., Edward E. Smith, Jr., and Kenneth B. Tankersley
1996 A Stone's Throw from Kimmswick: Clovis Period Research in Kentucky. In *The Paleoindian and Archaic Southeast*, edited by David G. Anderson and Kenneth E. Sassaman, pp. 385-403. University of Alabama Press, Tuscaloosa.

French, Michael W.
1998 *Early Archaic Settlement Mobility, Lithic Resource Use, and Technological Organization in the Lower Ohio River Valley: a Perspective from the Longworth-Gick Site (15Jf243)*. Unpublished Master's thesis, Department of Anthropology, University of Kentucky, Lexington.

Frison, George C.
1983 The Western Plains and Mountain Region. In *Early Man in the New World*, edited by Richard Shulter, pp. 109-124. Sage Publications, Beverly Hills.

1989 Experimental Use of Clovis Weaponry and Tools on African Elephants. *American Antiquity* 54(766-784).

1999 The Pleistocene Prehistory of the Northwestern Plains, the Adjacent Mountains, and Intermontane Basins. In *Ice Age Peoples of North America: Environments, Origins, and Adaptations*, edited by Robson Bonnichsen and Karen L. Turnmire, pp. 264-280. Center for the Study of the First Americans, Department of Anthropology, Texas A&M University Press, College Station.

Frison, George C., and George Zeimens
1980 Bone Projectile Points: An Addition to the Folsom Culture Complex. *American Antiquity* 45:231-237.

Funkhouser, William D., and William S. Webb
1928 *Ancient Life in Kentucky*. Kentucky Geological Survey, Geological Reports, Series 6, Vol. 34.

Gardner, William M.
1983 Stop Me If You've Heard This One Before: The flint Run Paleo-Indian Complex Revisited. *Archaeology of Eastern North America* 11:49-64.

Gatus, Thomas W.
1982 A Methodological History and Prognosis for Chen Studies in Kentucky. *Kentucky Archaeological Association Bulletin* 18 and 19.

1983 A Reconnaissance and Evaluation of Archaeological Sites in Pulaski County, Kentucky. Archaeological Survey Report No. 18. Kentucky Heritage Commission, Frankton.

Gatus, Thomas W., and Richard A. Boisvert
1977 *A Reconnaissance and Evaluation of Archaeological Sites in Clark County Kentucky*. Archaeological Survey Report No.4. Kentucky Heritage Commission, Frankfort.

Gatus, Thomas W., and William H. Marquardt
1984 *Early Man Studies in Western Kentucky: The 1983 Season*. Ms. on file, Kentucky Heritage Council, Frankfort.

Gatus, Thomas W., and David R. Maynard
1978 Karst Topography: A Factor Associated with Paleo-Indian Settlement in Certain Areas of Kentucky. *Tennessee Anthropologist* 3(2):203-210.

Gibbs, George
1862 Instructions for Archaeological Investigations in the United States. *Smithsonian Institution Annual Report for 1861*, Washington, D. C.

Goebel, Ted
2004 The Search for a Clovis Progenitor in Subarctic Siberia. In *Entering America: Northeast Asia and Beringia Before the Last Glacial Maximum*, edited by David B. Madsen, pp. 311-356. University of Utah Press, Salt Lake City.

Goebel, Ted, Roger Powers, and Nancy. Bigelow
1991 The Nenana Complex of Alaska and Clovis Origins. In *Clovis: Origins and Adaptations*, edited by Robson Bonnichsen and Karen L. Turnmire, pp. 49-79. Center for the Study of the First Americans, Oregon State University, Corvallis.

Golledge, Reginald G. (editor)
1999 *Wayfinding Behavior: Cognitive Mapping and Other Spatial Processes*. Johns Hopkins University Press, Baltimore.

Goodyear, Albert C., III
1974 *The Brand Site: A Techno-functional Study of a Dalton Site in Northeast Arkansas*. Arkansas Research Series No.7. Arkansas Archaeological Survey, Fayetteville.

1979 *A Hypothesis for the Use of Cryptocrystalline Raw Materials Among Paleo-Indian Groups of North America*. Research Manuscript Series No. 156. Institute of Archaeology and Anthropology, University of South Carolina, Columbia.

1982 The Chronological Position of the Dalton Horizon in the Southeastern United States. *American Antiquity* 47:382-395.

1999 The Early Holocene Occupation of the Southeastern United States: A Geoarchaeological Summary. In *Ice Age Peoples of North America: Environments, Origins, and Adaptations*, edited by Robson Bonnichsen and Karen L. Turnmire, pp. 432-481. Center for the Study of the First Americans, Department of Anthropology, Texas A&M University Press, College Station.

Graham, Russel W., C. Vance Haynes, Donald Lee Johnson, and Marvin Kay
1981 Kimmswick: A Clovis-Mastodon Association in Eastern Missouri. *Science* 213(4512): 1115-1117.

Graham, Russel W., and Marvin Kay
1988 Taphonomic Comparisons of Cultural and Noncultural Faunal Deposits at the Kimmswick and Bamhan Sites, Jefferson County Missouri. In *Late Pleistocene and Early Holocene Paleoecology and Archaeology of the Eastern Great Lakes Region*, edited by Richard S. Laub, Norton G. Miller, and David W. Steadman, pp. 227-240. Bulletin No. 33. Buffalo Society of Natural Sciences, Buffalo.

Gramly, Richard M., and Kerry Rutledge
1981 A New Paleo-Indian Site in the State of Maine. *American Antiquity* 46:354-361.

1982 *The Vail Site: A Paleo-Indian Encampment in Maine*. Buffalo Museum of Science, Buffalo.

Gramly, Richard M., and Carl Yahnig
1991 The Adams Site (15Ch90) and the Little River, Christian County, Kentucky, Clovis Workshop Complex. *Southeastern Archaeology* 10:134-145.

Gray, Henry H.
1984 Archaeological Sedimentology of Overbank Silt Deposition on the floodplain of the Ohio River Near Louisville, Kentucky. Journal of Archaeological Science 11:421-432.

Grayson, Donald K.
1987 An Analysis of the Chronology of Late Pleistocene Mammalian Extinctions in North America. *Quaternary Research* 28: 281-289.

Grayson, Donald K., and David J. Meltzer
2002 Clovis Hunting and Large Mammal Extinction: Critical Review of the Evidence. *Journal of World Prehistory* 16: 313-359.

Green, Frank E.
1963 The Clovis Blades: An Important Addition to the Lloan Complex. *American Antiquity* 29(2):145-165.

Greenberg, Joseph H., Christy. G. Turner, and Stephen L. Zegura
1986 The Settlement of the Americas: A Comparison of Linguistic, Dental, and Genetic Evidence. *Current Anthropology* 27: 477-497.

Gruhn, Ruth
1987 Aboriginal Culture History Through Linguistics and Archaeology in the Great Basin. *Idaho Archaeologist* 10(1):3-8.

2004 Current Archaeological Evidence of Late-Pleistocene Settlement of South America. In *New Perspectives on the First Americans*, edited by Bradley T. Lepper and Robson Bonnichsen, pp. 27-34. Center for the Study of the First Americans, Texas A&M University Press, College Station.

Haag, Crista M.
2004 *An Analysis of Clovis Blade Reduction Sequences from the Adams Site (15Ch90) and the Joe Priddy Site (15Hd583): Implications for Early Paleoindian Mobility and Lithic Procurement in Kentucky*. Unpublished Master's thesis, Department of Anthropology, University of Kentucky.

Haag, William G.
1942 Early Horizons in the Southeast. *American Antiquity* 7:209-222.

Hamilton, Thomas D., and Ted Goebel
1999 Late Pleistocene Peopling of Alaska. In *Ice Age Peoples of North America: Environments, Origins, and Adaptations of the First Americans*, edited by Robson Bonnichsen and Karen L. Turnmire, pp. 156-199. Center for the Study of the First Americans, Oregon State University, Corvallis.

Haskins, Valerie A.
1986 The Prehistory of Prewitts Knob, Kentucky. Paper Presented at the 51st Meeting of the Society for American Archaeology, New Orleans.

1988 The Prehistory of Prewitts Knob, Kentucky: Preliminary Analysis and Interpretations. In *Paleoindian and Archaic Research in Kentucky*, edited by Charles D. Hockensmith, David Pollack, and Thomas N. Sanders, pp. 233-250. Kentucky Heritage Council, Frankfort.

Haynes, C. Vance
1964 Fluted Projectile Points: Their Age and Dispersion. *Science* 145:1408-1413.

1966 Elephant Hunting in North America. *Scientific American* 214:104-112.

1980 The Clovis Culture. In *The Ice-Free Corridor and Peopling of the New World*, edited by Natt W. Rutter and Charles E. Schweger, pp. 115-123. Canadian Journal of Anthropology 1.

1982 Were Clovis Progenitors in Beringia? In *Paleoecology of Beringia*, edited by David M. Hopkins, John V. Matthews, Charles E. Schweger, and Steven B. Young. Academic Press, New York.

1987 Clovis Origin Update. *The Kiva* 52(2):83-93.

Haynes, C. Vance, D. Jack Donahue, A. J. T. Jull, and T. H. Zabel
1984 Application of Accelerator Dating to Fluted Point Paleo-Indian Sites. *Archaeology of Eastern North America* 12:184-191.

Haynes, Gary
2002 *The Early Settlement of North America: The Clovis Era*. Cambridge University Press, Cambridge.

Henry, Donald O.
1985 Preagricultural Sedentism: The Natufian Example. In *Prehistoric Hunter-Gatherers: The Emergence of Cultural Complexity*, edited by T. Douglas Price and James A. Brown, pp. 365-384. Academic Press, Orlando.

Hollenbach, Kandace D.
2007 Gathering in the Late Paleoindian Period: Archaeobotanical Remains from Dust Cave, Alabama. In *Foragers of the Terminal Pleistocene in North America*, edited by Renee B. Walker and Boyce N. Driskell, pp. 132-147. University of Nebraska Press, Lincoln.

Horai, Satoshi, Rumi Kondo, Yuko Nakasawa-Hattori, Seiji Hayashi, Shunro Sonoda, and Kazuo Tajima
1993 Peopling of the Americas, Founded by Four Major Lineages of Mitochondrial DNA. Molecular Biology and Evolution 10:23-47.

Horai, Satoshi, K. Murayama, K. Hayasaka, S. Matsubayashi, Y. Hattori, G. Fucharoen, S. Harihara, K. S. Park, K. Omoto, and I. H. Pan
1996 mtDNA Polymorphism in East Asian Populations, With Special Reference to the Peopling of Japan. *American Journal of Human Genetics* 59:579-590.

Jefferson, Thomas
1801 *Notes on the State of Virginia*. Philadelphia.

Jillson, Willard R.
1936 *Big Bone Lick*. Big Bone Lick Association Publications No.1. Louisville.

Jobe, Cynthia E., Roger C. Allen, and Richard A. Boisvert
1979 *An Archaeological Reconnaissance and Assessment of a Proposed Transmission Line, Railroad Spur, and New Plant Site in Western Kentucky*. Archaeological Report No. 22. Department of Anthropology, University of Kentucky, Lexington

Jones, Terry L., Richard T. Fitzgerald, Douglas J. Kennett, Charles H. Miksicek, John L. Fagan, John Sharp, and Jon M. Erlandson
2002 The Cross Creek Site (CA-SLO-1797) and Its Implications for New World Colonization. *American Antiquity* 67(2):213-230.

Judge, James W., and Jerry Dawson
1972 Paleo-Indian Settlement Technology in New Mexico. *Science* 176:1210-1216.

Justice, Noel D.
1984 *Diagnostic Projectile Points of Eastern United States Archaeology*. Unpublished Master's thesis, Department of Anthropology, Indiana University, Bloomington.

1987 *Stone Age Spear and Arrow Points of the Midcontinental and Eastern United States: A Modern Survey and Reference*. Indiana University Press, Bloomington.

Kay, Marvin
1996 Microwear Analysis of Some Clovis and Experimental Chipped Stone Tools. In *Stone Tools: Theoretical Insights into Human Prehistory*, edited by George H. Odell, pp. 315-344. Plenum Press, New York.

Kelly, Robert L.
2003 Maybe We Do Know When People First Came to North America; and What Does It Mean If We Do? *Quaternary International* 109-110:133-145.

Kelly, Robert L., and Lawrence C. Todd
1988 Coming into the Country: Early Paleoindian Hunting and Mobility. *American Antiquity* 53:231-244.

Keefer, David K., Susan D. deFrance, Michael E. Moseley, James B. Richardson, III, Dennis R. Satterlee, and Amy. Day-Lewis
1998 Early Maritime Economy and El Niño Events at Quebrada Tacahuay, Peru. *Science* 281:1833-1835.

Kipnis, Renato
1998 Early Hunter-Gatherers in the Americas: Perspectives from Central Brazil. *Antiquity* 72(277):581-592.

Kooper, J. S., Robert E. Funk, and Lewis Dumont
1980 Additional Paleo-Indian and Archaic Materials from the Dutchess Quarry Cave Area, Orange County, New York. *Archaeology of Eastern North America* 8:125-137.

Kornfield, Marcel
2007 Are Paleoindians of the Great Plains and Rockies Subsistence Specialists? In *Foragers of the Terminal Pleistocene in North America*, edited by Renee B. Walker and Boyce N. Driskell, pp. 32-58. University of Nebraska Press, Lincoln.

Kurten, Bjorn, and Elaine Anderson
1980 *Pleistocene Mammals of North America*. Columbia University Press, New York.

Lahren, Larry, and Robson Bonnichsen
1974 Bone Foreshafts from a Clovis Burial in Southwestern Montana. *Science* 186:147-150.

Lane, Leon
1995 Site 15Cu44, site inventory form. On file, Office of State Archaeology, University of Kentucky, Lexington.

1996a Site 15Cu21, site inventory form. On file, Office of State Archaeology, University of Kentucky, Lexington.

1996b Site 15Cu43, site inventory form. On file, Office of State Archaeology, University of Kentucky, Lexington.

1996c Site 15Cu46, site inventory form. On file, Office of State Archaeology, University of Kentucky, Lexington.

1996d Site 15Cu63, site inventory form. On file, Office of State Archaeology, University of Kentucky, Lexington.

1997a Site 15Cu67, site inventory form. On file, Office of State Archaeology, University of Kentucky, Lexington.

1997b Site 15Cu81, site inventory form. On file, Office of State Archaeology, University of Kentucky, Lexington.

Lane, Leon, and David G. Anderson
2001 Paleoindian Occupations of the Southern Appalachians. In *Archaeology of the Appalachian Highlands*, edited by Lynne P. Sullivan and Susan C. Prezzano, pp. 88-102. University of Tennessee Press, Knoxville.

Lane, Leon, and Melissa Gordon
1997 *Late Paleoindian-Early Archaic Adaptations at the Red Sand Site (15Ht46), Hart County, Kentucky*. Archaeological Report No. 17. Kentucky Archaeological Survey, Lexington.

Lane, Leon, and J. David McBride
1997 Site 15Cu64, site inventory form. On file, Office of State Archaeology, University of Kentucky, Lexington.

Lane, Leon, and Carl Shields
1997 Site 15Cu74, site inventory form. On file, Office of State Archaeology, University of Kentucky, Lexington.

Lane, Leon, Kary Stackelbeck, and James M. White
1997 The Joe Priddy Site: A Multi-Component Quarry Site in Hardin County, Kentucky. Paper presented at the Fourteenth Annual Kentucky Heritage Council Archaeological Conference, Natural Bridge State Park, Slade, Kentucky

Lane, Leon, Dennis Stanford, Tom Dillehay, C. Vance Haynes, Carl Shields, and Michael French
1995 Early Paleoindians and Eastern U.S. Rockshelters: Findings and Implications of Test Excavations at Wolfe Shelter (15Cu21). In *Current Archaeological Research in Kentucky: Volume Three*, edited by John F. Doershuk, Christopher A. Bergman, and David Pollack, pp.1-22. Kentucky Heritage Council, Frankfort.

Lavallée, Danièle
2000 *The First South Americans*. University of Utah Press, Salt Lake City.

Lepper, Bradley T.
1983 Fluted Point Distributional Patterns in the Eastern United States: A Contemporary Phenomenon. *Midcontinental Journal of Archaeology* 8(2):269-285.

1986 *Early Paleo-Indian Land Use Patterns in the Central Muskingum River Basin, Coshocton County, Ohio*. Unpublished Ph.D. dissertation, Department of Anthropology, Ohio State University, Columbus.

Lepper, Bradley T., and Robson Bonnichsen
2004 New Perspectives on the First Americans: Introductory Remarks. In *New Perspectives on the First Americans*, edited by Bradley T. Lepper and Robson Bonnichsen, pp. 1- 11. Center for the Study of the First Americans, Department of Anthropology, Texas A&M University Press, College Station.

Lopinot, Neal H., Jack H. Ray, and Michael D. Connor (editors)
2000 *The 1999 Excavations at the Big Eddy Site (23CE426)*. Special Publication No. 3. Center for Archaeological Research, Southwest Missouri State University, Springfield.

Lothrop, Johnathon C., and Richard M. Gramly
1982 Pieces Esquillees from the Vail Site. *Archaeology of Eastern North America* 10:1-22.

Lowthert, William Hughes, IV
1998 *Source Use and Settlement Patterning Around the Saline Springs and Salt Licks in Big Bone Lick State Park, Boone County, Kentucky*. Unpublished Master's thesis, Department of Anthropology, University of Kentucky, Lexington.

Lyman, R. Lee, Michael J. O'Brien, and Virgil Hayes
1998 A Mechanical and Functional Study of Bone Rods from the Richey-Roberts Clovis Cache, Washington, U.S.A. *Journal of Archaeological Science* 25:887-906.

Lynch, Thomas F.
1974 The Antiquity of Man in South America. *Quaternary Research* 4:356-377.

1983 The Paleo-Indians. In *Ancient South Americans*, edited by Jesse D. Jennings, pp. 87-137. W.H. Freeman and Company, New York.

1990 Glacial Age Man in South America: A Critical Review. *American Antiquity* 55:12-36.

MacDonald, George F.
1968 *Debert: A Paleo-Indian Site in Central Nova Scotia*. Anthropological Papers No. 16. National Museum of Canada, Ottawa.

1983 Eastern North America. In *Early Man in the New World*, edited by Richard Shutler, pp. 97-108. Sage Publications, Beverly Hills.

1985 *A Paleo-Indian Site in Central Nova Scotia*. Persimmon Press, Buffalo.

Madsen, David B.
2004 Colonization of the Americas before the Last Glacial Maximum: Issues and Problems. In *Entering America: Northeast Asia and Beringia before the Last Glacial Maximum*, edited by David B. Madsen, pp. 1-26. University of Utah Press, Salt Lake City.

Mandryk, Carole A. S.
1993 Hunter-gatherers Social Costs and the Nonviability of Submarginal Environments. *Journal of Anthropological Research* 49(1):39-72.

Martin, Paul S.
1967 Prehistoric Overkill. In *Pleistocene Extinctions: The Search for a Cause*, edited by Paul S. Martin and H. E. Wright, pp. 75-120. Yale University Press, New Haven.

1973 The Discovery of America. *Science* 179: 969-974.

1984 Prehistoric Overkill: The Global Model. In *Quaternary Extinctions: A Prehistoric Revolution*, edited by Paul S. Martin and Richard G. Klein, pp. 354-404. University of Arizona Press, Tucson.

Martin, Paul S., George I. Quimby, and Donald Collier
1947 *Indians Before Columbus: Twenty Thousand Years of North American History Revealed by Archaeology*. University of Chicago Press, Chicago.

Mason, Ronald J.
1962 The Paleo-Indian Tradition in Eastern North America. *Current Anthropology* 3(3):227-246.

Mayer-Oakes, William J.
1955 *Prehistory of the Upper Ohio Valley*. Annals of the Carnegie Museum, Vol. 34. Pittsburgh.

1963 Early Man in the Andes. *Scientific American*.

McCary, Ben C.
1951 A Workshop of Early Man in Dinwiddie County, Virginia. *American Antiquity* 17:9-17.

McAvoy, Joseph M.
1997 Addendum: Excavation of the Cactus Hill Site, 44SX202, Areas A-B, Spring 1996: Summary Report of Activities and Findings. In *Archaeological Investigations of Site 44SX202, Cactus Hill, Sussex County, Virginia*. Virginia Department of Historic Resources, Nottoway River Survey Archaeological Research, Sandston, Virginia.

McAvoy, Joseph M., and Lynn D. McAvoy
1997 *Archaeological Investigations of Site 44SX202, Cactus Hill, Sussex County, Virginia*. Virginia Department of Historic Resources, Nottoway River Survey Archaeological Research, Sandston, Virginia.

McGraw, Betty J.
1976 Archaeological Survey and Testing in the Proposed. Taylorsville Reservoir in Anderson, Spencer, and Nelson Counties, Kentucky. Report on file, Office of State Archaeology, University of Kentucky, Lexington.

McNett, Charles W.
1985 *Shawnee Minisink*. Academic Press, New York.

McWheeney, Lucinda
2007 Revising the Paleoindian Environmental Picture in Northeastern North America. In *Foragers of the Terminal Pleistocene in North America*, edited by Renee B. Walker and Boyce N. Driskell, pp. 148-166. University of Nebraska Press, Lincoln.

Meadows, Larry G.
1977 Chert Resources of Powell County in Concurrence with Aboriginal Usage. In *A Reconnaissance of Archaeological Sites in Powell County, Kentucky*, by Marcia K. Weinland and Thomas N. Sanders, pp. 98-122. Archaeological Survey Report No. 3. Kentucky Heritage Commission, Frankfort.

Meltzer, David J.
1984 *Late Pleistocene Human Adaptations in Eastern North America*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Washington, Seattle.

1985a On Stone Procurement and Settlement Mobility in Eastern Fluted Point Groups. *North American Archaeologist* 6(1):1-24.

1985b North American Archaeology and Archaeologists, 1879-1934. *American Antiquity* 50(2):249-260.

1993 Is there a Clovis Adaptation? In *From Kostenki to Clovis: Upper Paleolithic—Paleoindian Adaptation*, edited by Olga Soffer and N. D. Praslov, pp. 293-310. Plenum Press, New York.

2002 What Do You Do When No One's Been There Before? Thoughts on the Exploration and Colonization of New Lands. In *The First Americans: The Pleistocene Colonization of the New World*, edited by Nina G. Jablonski, pp. 27-58. Memoirs of the California Academy of Sciences No. 27, San Francisco.

2004 On Possibilities, Prospecting, and Patterns: Thinking about a Pre-LGM Human Presence in the Americas. In *Entering America: Northeast Asia and Beringia Before the Last*

Glacial Maximum, edited by David B. Madsen, pp. 359-377. University of Utah Press, Salt Lake City.

Meltzer, David, Donald K. Grayson, Gerardo Ardila, Alex W. Barker, Dena F. Dincauze, C. Vance Haynes, Francisco Mena, Lautaro Núñez, and Dennis J. Stanford
1997 On the Pleistocene Antiquity of Monte Verde, Chile. *American Antiquity* 62:659-663.

Merriwether, D. Andrew
2002 A Mitochondrial Perspective on the Peopling of the New World. In *The First Americans: The Pleistocene Colonization of the New World*, edited by Nina G. Jablonski, pp. 295-310. California Academy of Sciences Memoirs No. 27, San Francisco.

Miller, Donald A., and Michael Striker
2005 *A Phase I Intensive Archaeological Survey for the Proposed U.S. 641 Relocation from Marion to Fredonia, Caldwell and Crittenden Counties, Kentucky*. ASC Group, Florence, Kentucky.

Miotti, Laura
2003 Patagonia: A Paradox for Building Images of the First Americans during the Pleistocene/Holocene Transition. *Quaternary International* 109-110:147-173.

Miotti, Laura, and Monica Salemme
1999 Biodiversity, Taxonomic Richness and Specialists-Generalists during Late Pleistocene/ Early Holocene Times in Pampa and Patagonia (Argentina, Southern South America). *Quaternary International* 53/54:53-68.

Mocas, Stephen T.
1977 *Excavations at the Lawrence Site (l5Tr33), Trigg County, Kentucky*. University of Louisville Archaeological Survey, Louisville.

1993a Site 15Bc282, site inventory form. On file with the Office of State Archaeology, University of Kentucky, Lexington.

1993b Site 15Bc283, site inventory form. On file with the Office of State Archaeology, University of Kentucky, Lexington.

Moeller, Roger W.
1980 *6LF21: A Paleo-Indian Site in Western Connecticut*. Occasional Paper No.2. American Indian Institute.

Moffat, Charles R., and Kit W. Wesler
1983 *An Archaeological Reconnaissance of the Portion of the Proposed Improvements of the Wastewater Treatment Facilities in the City of Princeton, Caldwell County, Kentucky.* Department of Sociology and Anthropology, Murray State University, Murray, Kentucky.

Moorehead, William K.
1892 *Primitive Man in Ohio*. G. P. Putnam's Sons, New York.

Morrow, Juliet E.
1995 Clovis Point Manufacture: A Perspective from the Ready/Lincoln Hills Site in Jersey County, Illinois. *Midcontinental Journal of Archaeology* 20:167-191.

1996 *The Organization of Early Paleoindian Lithic Technology in the Confluence Region of the Mississippi, Illinois, and Missouri Rivers*. Unpublished Ph.D. dissertation, Department of Anthropology, Washington University, St. Louis.

Morrow, Juliet E., and Toby A. Morrow
1999 Geographic Variation in Fluted Projectile Points: A Hemispheric Perspective. *American Antiquity* 64(2):215-230.

Morse, Dan F.
1975 Paleo-Indian in the Land of Opportunity: Preliminary Report on the Excavations at the Sloan Site (3GE94). In *The Cache River Archaeological Project: An Experiment in Contract Archaeology*, assembled by Michael B. Schiffer and John H. House, pp. 135-143. Research Series No. 8. Arkansas Archaeological Survey, Fayetteville.

Morse, Dan F. (editor)
1997 *Sloan: A Paleoindian Dalton Cemetery in Arkansas*. Smithsonian Institution Press, Washington, D.C.

Morse, Dan F., David G. Anderson, and Albert C. Goodyear
1996 The Pleistocene-Holocene Transition in the Eastern United States. In *Humans at the End of the Ice Age: The Archaeology of the Pleistocene-Holocene Transition*, edited by Lawrence Guy Straus, Berit Valentin Eriksen, Jon M. Erlandson and David R. Yesner, pp. 319-338. Plenum Press, New York.

Mossiman, James E., and Paul S. Martin
1975 Simulating Overkill by Paleoindians. *American Scientist* 63:304-313.

Muller, Jon
1986 *The Archaeology of the Lower Ohio River Valley*. Academic Press, New York.

Munford, Danusa, Maria do Carmo Zanini, and Walter A. Neves
1995 Human Cranial Variation in South America: Implications for the Settlement of the New World. *Revista Brasileira de Genetica* 18:673-688.

Munson, Patrick J.
1985 The Paleo-Indian Hunters. In *Illinois Archaeology*, edited by James W. Porter and Dorcas S. Rohn, pp. 37-40. Bulletin No. 1. Illinois Archaeological Survey, Springfield, Revised.

Nance, Jack D.
1984 Lithic Exploitation Studies in the Lower Tennessee-Cumberland Valleys, Western Kentucky. In *Prehistoric Chert Exploitation: Studies from the Midcontinent*, edited by Brian M. Butler and Ernest E. May, pp. 101-128. Occasional Paper No.2. Center for Archaeological Investigations, Carbondale, Illinois.

Neves, Walter A., Danusa Munford, and Maria do Carmo
1996 Cranial Morphological Variation and the Colonization of the New World: Towards a Four-Migration Model. *American Journal of Physical Anthropology* 22:176.

Nichols, Johanna
1990 Linguistic Diversity and the First Settlement of the New World. *Language* 66:475-521.

2002 The First American Languages. In *The First Americans: The Pleistocene Colonization of the New World*, edited by Nina G. Jablonski, pp. 273-293. California Academy of Sciences Memoirs No. 27, San Francisco.

Niquette, Charles M.
1984 *Limited Archaeological Testing at 15Bo16, a Paleo-Indian Temporary Camp in the Outer Bluegrass, Boyle County, Kentucky*. Cultural Resource Analysts, Lexington.

1986 A Paleoindian Projectile Point Survey in South-Central Kentucky. Ms. on file, Cultural Resource Analysts, Lexington.

O'Malley, Nancy, Annette Nekola, Kenneth W. Robinson, and David Pollack
1981 *A Cultural Resource Assessment of Areas of Proposed Sewer System Construction, Simpsonville. Shelby County. Kentucky*. Archaeological Report No. 38. Department of Anthropology, University of Kentucky, Lexington.

Oshsenius, Claudio, and Ruth Gruhn (editors)
1979 *Taima-Taima: A Late Pleistocene Paleo-Indian Kill Site in Northernmost South America—Final Report of 1976 Excavations*. Programa CIPICS, Monografias Cientificas. Universidad Francisco de Miranda, Coro. Reprinted by the Center for the Study of the First Americans, Oregon State University, Corvallis.

Ottesen, Ann I.
1981 Report on a Preliminary Study of Prehistoric Settlement Patterns in Three Counties in Northwestern Kentucky. Ms. on file, Kentucky Heritage Council, Frankfort.

Palmer, Harris A., and James Stoltman
1976 The Boaz Mastodon: A Possible Association of Man and Mastodon in Wisconsin. *Midcontinental Journal of Archaeology* 1:163-177.

Parmalee, Paul W., Patrick J. Munson, and John E. Guilday
1978 The Pleistocene Mammalian Fauna of Harrodsburg Crevice, Monroe County, Indiana. *National Speleological Society Bulletin* 40:64-75.

Politis, Gustavo G.
1991 Fishtail Projectile Points in the Southern Cone of South America: An Overview. In *Clovis: Origins and Adaptations*, edited by Robson Bonnichsen and Karen L. Turnmire, pp. 287-302. Center for the Study of the First Americans, Oregon State University, Corvallis, Oregon.

Powers, William R. and John F. Hoffecker
1989 Late Pleistocene Settlement in the Nenana Valley, Central Alaska. *American Antiquity* 54:263-287.

Prufer, Olaf H.
1960 *Survey of Ohio Fluted Points. Numbers 1. 2. and 3*. Cleveland Museum of Natural History, Cleveland.

Prufer, Olaf H., and Raymond S. Baby
1963 *Paleo-Indians of Ohio*. Ohio Historical Society, Columbus.

Ray, Jack H.
1998 *A Diachronic Study of Chert Procurement and Utilization in the Upper Rolling Fork River Valley, Marion County, Kentucky*. Research Report No. 1044. Center for Archaeological Research, Southwest Missouri State University, Springfield.

1999 *A Geoarchaeological Study in the Upper Rolling Fork River Valley, Marion County, Kentucky*. Research Report No. 1051. Center for Archaeological Research, Southwest Missouri State University, Springfield.

2000 Nonexcavated Collections from Big Eddy and Nearby Sites. In *The 1999 Excavations At the Big Eddy Site (23CE426)*, edited by Neal H. Lopinot, Jack H. Ray, and Michael D. Conner, pp. 37-68. Special Publication No. 3. Center for Archaeological Research, Southwest Missouri State University, Springfield.

2003 *A Survey of Paleoindian Points from the Upper Rolling Fork and Beech Fork Drainage Basins in Central Kentucky*. Research Report No. 1209. Center for Archaeological Research, Southwest Missouri State University, Springfield.

Ray, Jack H., Neal H. Lopinot, Edwin R. Hajic, and Rolfe D. Mandel
1988 The Big Eddy Site: A Multicomponent Paleoindian Site on the Ozark Border, Southwest Missouri. *Plains Anthropologist* 43:73-81.

Redmond, Brian G., and Kenneth B. Tankersley
2005 Evidence of Early Paleoindian Bone Modification and Use at the Sheriden Cave Site (33WY252), Wyandot County, Ohio. *American Antiquity* 70(3):503-526.

Reid, Kenneth C.
1984 Fire and Ice: New Evidence for the Production and Preservation of Fiber-Tempered Pottery in the Middle-Latitude Lowlands. *American Antiquity* 49(1):55-76.

Richardson, James B. III
1981 Modeling the Development of Sedentary Maritime Economies on the Coast of Peru: A Preliminary Statement. *Annals of the Carnegie Museum* 50(5):139-150.

1983 The Chira Beach Ridges, Sea Level Change and the Origins of Maritime Economies on the Peruvian Coast. *Annals of Carnegie Museum* 52:265-276.

Rick, Torben C., Jon M. Erlandson, Rene Vellanoweth, and Todd J. Braje
2005 From Pleistocene Mariners to Complex Hunter-Gatherers: The Archaeology of the California Channel Islands. *Journal of World Prehistory* 19(3):169-228.

Ritchie, William A.
1985 50 Years of Archaeology in the Northeastern United States: A Retrospect. *American Antiquity* 50(2):412-420.

Roberts, Frank. H. H., Jr.
1939 The Folsom Problem in American Archaeology. *Smithsonian Institution Annual Report* 1938:531-546.

Robinson, Kenneth W., Thomas W. Gatus, and Robert L. Brooks
1979 *Archaeological Resources Reconnaissance Survey and Evaluation, Taylorsville Lake, Salt River Basin, Spencer, Anderson, and Nelson Counties, Kentucky*. Archaeological Report No.7. Department of Anthropology, University of Kentucky, Lexington.

Robinson, Kenneth W., Steven D. Smith, and Michael B. Collins.
1978 *A Cultural Resource Survey and Limited Subsurface Reconnaissance of the Proposed Synthetic Gas Demonstration Plant Area, Baskett, Henderson County, Kentucky.* Department of Anthropology, University of Kentucky, Lexington.

Rockman, Marcy
2003 Knowledge and Learning in the Archaeology of Colonization. In *Colonization of Unfamiliar Landscapes: The Archaeology of Adaptation*, edited by Marcy Rockman and James Steele, pp. 3-24. Routledge, London.

Rogers, Richard A.
1986 Spurred End Scrapers as Diagnostic Paleoindian Artifacts: A Distributional Analysis on Stream Terraces. *American Antiquity* 51(2):338-340.

Rolingson, Martha Ann
1964 *Paleo-Indian Culture in Kentucky*. Studies in Anthropology No. 2. University of Kentucky Press, Lexington.

Rolingson, Martha Ann, and Douglas W. Schwartz
1966 *Late Paleo-Indian and Early Archaic Manifestations in Western Kentucky*. Studies in Anthropology No.3. University of Kentucky Press, Lexington.

Sanders, Thomas N.
1983 *The Manufacturing of Chipped Stone Tools at a Paleoindian Site in Western Kentucky.* Unpublished Master's thesis, Department of Anthropology, University of Kentucky, Lexington.

1988 The Adams Site: A Paleoindian Manufacturing and Habitation Site in Christian County, Kentucky. In *Paleoindian and Archaic Research in Kentucky*, edited by Charles D. Hockensmith, David Pollack, and Thomas N. Sanders, pp. 1-24. Kentucky Heritage Council, Frankfort.

1990 *Adams: The Manufacturing of Flaked Stone Tools at a Paleoindian Site in Western Kentucky*. Monographs in Archaeology, Persimmon Press, Buffalo, New York.

Sanders, Thomas N., and David R. Maynard .
1979 *A Reconnaissance and Evaluation of Archaeological Sites in Christian County, Kentucky*. Archaeological Survey Report No. 12. Kentucky Heritage Commission, Frankfort.

Sanders, Thomas N., and Marcia K. Weinland
1976 *A Reconnaissance and Evaluation of Archaeological Sites in Franklin County, Kentucky*. Archaeological Survey Report No. 1. Kentucky Heritage Commission, Frankfort.

Sandweiss, Daniel H., Heather McInnis, Richard L. Burger, Asunción Cano, Bernardino Ojeda, Rolando Paredes, María del Carmen Sandweiss, Michael D. Glascock
1998 Quebrada Jaguay: Early South American Maritime Adaptations. *Science* 281:1830-1832.

Saunders, Jeffery R., C. Vance Haynes, Dennis Stanford, and George A. Agogino
1990 A Mammoth-Ivory Semifabricate from Blackwater Locality No.1, New Mexico. *American Antiquity* 55:112-119.

Schenian, Pamela A.
1988 An Overview of the Paleo-Indian and Archaic Occupations of the Savage Cave Site. In *Paleoindian and Archaic Research in Kentucky*, edited by Charles D. Hockensmith, David Pollack, and Thomas N. Sanders, pp. 67-84. Kentucky Heritage Council, Frankfort.

Schock, Jack M., and Richard Alvey
1981 *An Archaeological Reconnaissance of the Proposed Lake Reba-Smith 9.2 Mile Long Powerline Route in Madison County, Kentucky*. Western Kentucky University, Bowling Green.

Schultz, C. Bertrand, Lloyd G. Tanner, Frank C. Whitmore, Jr., Louis L. Ray, and Ellis Crawford
1963 Paleontological Investigations at Big Bone Lick State Park, Kentucky. *Science,* New Series 142(3596):1167-1169.

1967 Big Bone Lick Kentucky. *Museum Notes. University of Nebraska News* 33(3):1-12.

Schurr, Theodore G.
2004 Molecular Genetic Diversity in Siberians and Native Americans Suggests an Early Colonization of the New World. In *Entering America: Northeast Asia and Beringia before the Last Glacial Maximum*, edited David B. Madsen, pp. 187-238. University of Utah Press, Salt Lake City.

Schwartz, Douglas W.
1967 *Conceptions of Kentucky Prehistory: A Case Study in the History of Archaeology.* Studies in Anthropology No.6. University of Kentucky Press, Lexington.

Seeman, Mark. F., and Olaf H. Prufer
1982 An Updated Distribution of Ohio Fluted Points. *Midcontinental Journal of Archaeology* 7(2):155-169.

Simons, Donald B., Michael J. Shott, and Henry T. Wright
1984 The Gainey Site: Variability in a Great Lakes Paleoindian Assemblage. *Archaeology of Eastern North America* 12:266-279.

Smith, Edward S.
1990 Paleoindian Economy and Settlement Patterns in the Wyandotte Chert Source Area, Unglaciated Southcentral Indiana. In *Early Paleoindian Economies of Eastern North America,* edited by Kenneth B. Tankersley and Barry L. Isaac, pp. 217-258. Research in Economic Anthropology, Supplement 5, JAI Press.

Solecki, Ralph S.
1951 Notes on Two Archaeological Discoveries in Northern Alaska. *American Antiquity* 17:55-57.

Sneed, Joel M.
1986 Investigations in Short Cave Kentucky. *National Speological Society News* 44:2:33-35.

Speiss Arthur E., Mary Lou Curran, and John R. Grimes
1985 Caribou (*Rangifer Tarandu L.*) Bones from New England Paleoindian Sites. *North American Archaeologist* 6(2):145-159.

Stackelbeck, Kary L.
1996 Blade Technology Investigations of a Possible Clovis Site in Hardin County, Kentucky. Ms. in possession of author, Lexington, Kentucky.

Stanford, Dennis
1999 Archaeology and Late Pleistocene Environments in the Plains and Southwestern United States. In *Ice Age Peoples of North America: Environments, Origins, and Adaptations*, edited by Robson Bonnichsen and Karen L. Turnmire, pp. 281-339. Center for the Study of the First Americans, Department of Anthropology, Texas A&M University Press, College Station.

Steele, D. Gentry, and Joseph F. Powell
1992 Peopling of the Americas: Paleobiological Evidence. *Human Biology* 64(3):303-336.

2002 Facing the Past: A View of the North American Human Fossil Record. In *The First Americans: The Pleistocene Colonization of the New World*, edited by Nina G. Jablonski, pp. 93-158. California Academy of Sciences, San Francisco.

Stewart, Thomas D.
1981 The Evolutionary Status of the First Americans. *American Journal of Physical Anthropology* 81:461-466.

Surovell, Todd
2000 Early Paleoindian Women, Children, Mobility, and Fertility. *American Antiquity* 65:493-508.

Szathmary, Emoke J. E.
1993 Genetics of Aboriginal North America. *Evolutionary Anthropology* 1(6):202-220.

Tankersley, Kenneth B.
1983 The Clovis Potential and Geoarchaeology of Big Bone Lick, Kentucky. Paper Presented at the 48th Annual Meeting of the Society for American Archaeology, Pittsburgh.

1985a Mineralogical Properties of Wyandotte Chen as an Aid to Archaeological Fingerprinting. In *Lithic Resource Procurement: Proceedings From the Second Conference on Prehistoric Chert Exploitation*, edited by Susan C. Vehik, pp. 251-264. Occasional Paper No.4. Center for Archaeological Investigations, Carbondale, Illinois.

1985b The Potential for Early-Man Sites at Big Bone Lick, Kentucky. *Tennessee Anthropologist* 10(1):27-49.

1986 Bison Exploitation by Late Fort Ancient Peoples in the Central Ohio River Valley. *North American Archaeologist* 7(4):289-303.

1987 Big Bone Lick, A Clovis Site in Northcentral Kentucky. *Current Research in the Pleistocene* 4:36-37.

1989a A Close Look at the Big Picture: Early Paleoindian Lithic Procurement in the Midwestern United States. In *Paleoindian Lithic Resource Use*, edited by Christopher Ellis and Jonathan Lothrop, pp. 259-292. Westview Press, Boulder, Colorado.

1989b *Late Pleistocene Lithic Exploitation and Human Settlement in the Midwestern United States*. Unpublished Ph.D. dissertation, Department of Anthropology, Indiana University, Bloomington.

1990a Late Pleistocene Lithic Exploitation in the Midwest and Midsouth: Indiana, Ohio, and Kentucky. In *Early Paleoindian Economies of Eastern North America*, edited by Kenneth B. Tankersley and Barry L. Isaac, pp. 259-299. Research in Economic Anthropology, Supplement 5, JAI Press.

1990b Paleoindian Period. In *The Archaeology of Kentucky: Past Accomplishments and Future Directions*, Volume 1, edited by David Pollack, pp. 73-142. Kentucky Heritage Council, State Historic Preservation Comprehensive Plan Report No. 1, Frankfort.

1996 Ice Age Hunters and Gatherers. In *Kentucky Archaeology*, edited R. Barry Lewis, pp. 21-38. University Press of Kentucky, Lexington.

1998 Variation in the Early Paleoindian Economies of Late Pleistocene Eastern North America. *American Antiquity* 63(1):7-20.

Tankersley, Kenneth B., and Barry L. Isaac
1990 Concluding Remarks on Paleoecology and Paleoeconomy. In Early Paleoindian Economies of Eastern North America, edited by Kenneth B. Tankersley and Barry L. Isaac, pp. 337-355. Research in Economic Anthropology, Supplement 5, JAI Press.

Tankersley, Kenneth B., and Cheryl Ann Munson
1992 Comments on the Meadowcroft Rockshelter Radiocarbon Chronology and the Recognition of Coal Contaminants. *American Antiquity* 57:321-326.

Tankersley, Kenneth B., Cheryl Ann Munson, and D. Smith
1987 Recognition of Bituminous Coal Contaminants in Radiocarbon Samples. *American Antiquity* 52:318-330.

Tankersley, Kenneth B., Patrick J. Munson, and Jenny R. Tankersley
1983 The Archaeological Geology of the Whitewater Great Miami Ohio River Confluence Area. *Geological Society of America Bulletin* 16(6):704.

Taylor, Dee C.
1969 The Wilsall Excavations: An Exercise in Frustration. *Proceedings of the Montana Academy of Science* 29:147-150.

Thompson, Raymond H.
1954 Archaic Culture in Kentucky. *Southern Indian Studies* 6:7-8.

Torroni, Antonio, James V., Neel, Ramiro Barrantes, Theodore G. Schurr, and Doughlas C. Wallace
1993 A Mitochondrial DNA "Clock" for the Amerinds and Its Implications for Timing Their Entry into North America. *Proceedings of the National Academy of Sciences* 91:1158-1162.

Turnbow, Christopher A., and Roger C. Allen
1977 *Report on Archaeological Shovel Testing at 15Kx5 in Knox County, Kentucky*. Archaeological Services of Kentucky, Lexington.

Turnbow, Christopher A., Malinda Stafford, Richard A. Boisvert, and Julie Riesenweber
1980 *A Cultural Resource Assessment of Two Alternate Locations of the Hancock power Plant. Hancock and Breckinridge Counties, Kentucky*. Archaeological Report No. 30. Department of Anthropology, University of Kentucky, Lexington.

Vento, Frank J.
1982 Flaked Stone Raw Materials. In *The Prehistory of the Paintsville Reservoir, Johnson and Morgan Counties, Kentucky*, compiled by James M. Adovasio, pp. 705-720. Ethnology Monographs No.6. Department of Anthropology, University of Pittsburgh, Pittsburgh.

Versluis, Vincent A.
1999 *A Phase I Archaeological Reconnaissance of Approximately 21 Acres for the Proposed Expansion of the Hopkinsville-Christian County Airport Runway Near Hopkinsville, Christian County, Kentucky*. Great Rivers Archaeological Services, Lexington.

Vesper, Dennis, and Ray Tanner
1984 Man and Mammoth in Kentucky. *Ohio Archaeologist* 34(3):18-19.

Wagner, Daniel P., and Joseph M. McAvoy
2004 Pedoarchaeology of Cactus Hill, a Sandy Paleoindian Site Southeastern Virginia, U.S.A. *Geoarchaeology* 19(4):297-322.

Walker, Renee B.
2007 Hunting in the Late Paleoindian Period: Faunal Remains from Dust Cave, Alabama. In *Foragers of the Terminal Pleistocene in North America*, edited by Renee B. Walker and Boyce N. Driskell, pp. 99-115. University of Nebraska Press, Lincoln.

Walker, Renee B., and Boyce N. Driskell
2007 Introduction: New Developments in Paleoindian Subsistence Studies. In *Foragers of the Terminal Pleistocene in North America*, edited by Renee B. Walker and Boyce N. Driskell, pp. ix-xv. University of Nebraska Press, Lincoln.

Walthal, John A.
1980 *Prehistoric Indians of the Southeast*. University of Alabama Press, Tuscaloosa.

Waters, Michael R.
1985 Early Man in the New World: An Evaluation of the Radiocarbon Dated Pre-Clovis Sites in the Americas. In *Environments and Extinctions: Man in Late Glacial North America*,

edited by Jim I. Mead and David J. Meltzer, pp. 125-143. Center for the Study of Early Man, University of Maine, Orono.

1986 Sulfur Springs Woman: An Early Human Skeleton from Southeastern Arizona. *American Antiquity* 51(2):361-365.

Walters, Matthew M.
1988 The Adams Mastodon Site. In *Paleoindian and Archaic Research in Kentucky*, edited by Charles D. Hockensmith, David Pollack, and Thomas N. Sanders, pp. 43-46. Kentucky Heritage Council, Frankfort.

Webb, William S.
1946 *Indian Knoll Site Oh2 Ohio County, Kentucky*. Reports in Anthropology and Archaeology 4:3:1. University of Kentucky, Lexington.

1950 *The Carlson Annis Mound Site 5 Butler County, Kentucky*. Reports in Anthropology and Archaeology 7:4. University of Kentucky, Lexington.

1951 *The Parrish Village Site 45 Hopkins County, Kentucky*. Reports in Anthropology and Archaeology 7:6. University of Kentucky, Lexington.

Webb, William S., and William D. Funkhouser
1934 *The Occurrence of the Fossil Remains of Pleistocene Vertebrates in the Caves of Barren Count, Kentucky*. Reports in Archaeology and Anthropology 3:2. University of Kentucky, Lexington.

Webb, David S., Jerald T. Milanich, Roger Alexon, and James S. Dunbar
1984 A *Bison Antiquus* Kill Site, Wacissa River, Jefferson County, Florida. *American Antiquity* 49(2):384-392.

Weinland, Marcia K., and Thomas W. Gatus
1979 *A Reconnaissance and Evaluation of Archaeological Sites in Ballard County, Kentucky.* Archaeological Survey Report No. 11. Kentucky Heritage Commission, Frankfort.

Weinland, Marcia K., and Jason M. Fenwick
1979 *A Reconnaissance and Evaluation of Archaeological Sites in Jessamine County, Kentucky*. Archaeological Survey Report No. 10. Kentucky Heritage Commission, Frankfort.

Weinland, Marcia K., and Gerald N. DeLorenze
1980 *A Reconnaissance and Evaluation of Archaeological Sites in Hopkins County, Kentucky.* Archaeological Survey Report No. 15. Kentucky Heritage Commission, Frankfort.

Wesler, Kit W.
1983 *Archaeological Testing of 15Lv152 and Reconnaissance of the Pipeline Corridor and Revised Treatment Plant Site in the Proposed Water Treatment Facility at Pinckneyville. Livingston County, Kentucky*. Department of Sociology and Anthropology, Murray State University, Murray, Kentucky.

Williams, Stephen, and James B. Stoltman
1965 An Outline of Southeastern United States Prehistory with Particular Emphasis on the Paleo-Indian Era. In *The Quaternary of the United States*, edited by Henry E. Wright and David G. Frey, pp. 669-683. Princeton University Press, Princeton.

Willey, Gordon R.
1985 Some Continuing Problems in New World Culture History. *American Antiquity* 50(2):351-363.

Willey, Gordon R., and Jeremy A. Sabloff
1982 *A History of American Archaeology*. Freeman, San Francisco.

Wilmsen, Edwin N.
1970 Lithic Analysis and Cultural Inference: A Paleo-Indian Case. *Anthropological Papers* No. 16. University of Arizona, Tucson.

Wood, Raymond W., and Bruce McMillan
1976 *Prehistoric Man and His Environments: A Case Study in the Ozark Highland*. Academic Press, New York.

Wormington, Helen Marie
1957 *Ancient Man in North America*. Popular Series No. 4. Denver Museum of Natural History, Denver.

Wilson, Ronald C., Philip J. DiBlasi, and Michael D. Green
1983 Site 15Bu244, site inventory form. On file, Office of State Archaeology, University of Kentucky, Lexington.

Yahnig, Carl
1986 The Clovis Fluted Point Reduction Sequence as Manifested at 15Ch236, A Paleo-Indian Site in Christian, County. Paper presented at the third Annual Kentucky Heritage Council Archaeology Conference, Louisville.

Young, Bennett H.
1910 *The Prehistoric Men of Kentucky*. Filson Club Publication, Louisville.